



# University of Minho





# AEE

## ANNUAL CONFERENCE 2014



**TRANSITIONS IN  
TEACHER EDUCATION AND  
PROFESSIONAL IDENTITIES**

**Proceedings**

**August, 25 to 27**

University of Minho, Braga, Portugal

**39<sup>th</sup> ATEE Conference**

**ATEE ANNUAL CONFERENCE 2014**

**Transitions in teacher education and professional identities**

**PROCEEDINGS**



**ATEE Annual Conference 2014 - Transitions in teacher education and professional identities**

**Proceedings**

Published 2015

ISBN: 9789081563987

EAN: 9789081563987

Organisers: Laurinda Leite, Maria Assunção Flores, Luís Dourado, Maria Teresa Vilaça, Sofia Morgado

Cover design by Nicolau Moreira, UMinho

Edited by:

ATEE (Association for Teacher Education)  
Brussels, Belgium

And

CIEd (Research Centre in Education – PEst-OE/CED/UI1661/2014)  
Institute of Education, University of Minho  
Braga, Portugal



## INTRODUCTION

The University of Minho, Braga, Portugal, was the host for the 2014 Annual Conference of the Association for Teacher Education in Europe (ATEE), which took place in August, from the 25<sup>th</sup> to the 27<sup>th</sup>.

The Conference focused on Transitions in Teacher Education and Professional Identities looked at the transitions in teacher education and analysed different experiences in professional identity of (student) teachers from an international perspective. Three keywords may be identified: challenges in teaching, dilemmas in teacher education and in teacher educators' role and current trends that are shaping teacher education in different contexts. Similar dilemmas and even contradictions have been identified in different settings with different modes of government intervention in teacher education in which content, structure and duration are also diverse but with similar features. Another key theme discussed at the Conference was the complexity of the concept of identity and also the contested nature of the transitions: transitions for what? How? Why? These transitions and shifts in teacher education and professional identities need to be examined within the context of current policies but also in the light of the complexities and contradictions of teaching as a profession. Teacher educators are also facing transitions in teacher education curricula but also regarding their own identities. These are complex processes that may include resistance and turbulence because transitions may be troublesome for many reasons. In this regard context and language matter but also the kinds of policies and practices that exist within teacher education. There are questions that remain unanswered. However, despite the differences, the dilemmas, and even the contradictions, teacher education can make a difference in professional identity development as was the case of successful experiences that have been described in the Conference.

These issues were discussed in three Keynotes' sessions, a roundtable, parallel or poster sessions and even in the Research and Development Communities (RDC) sessions. However, RDC meetings were also held to enable ongoing projects to be continued and existing networks to be strengthened or created.

There were about 270 conference participants, from which 140 were first attendants and 43 were students. Conference participants came from 50 countries all over the world.

Two hundred and sixty six papers and posters proposals were received. All the abstracts were double blind peer reviewed from which 53 were either rejected or withdrawn by their authors due to lack of funding. Thus, 182 papers were accepted to be presented but four of them were cancelled at the last minute, due to authors' impediment. Papers were all arranged into 38 parallel sessions. As far as posters are concerned, 31 posters were accepted even though only 28 were in fact displayed during the conference. Hence, in the whole, there were 206 presentations at the conference. Authors of these presentations were invited to write and submit a full paper to be published in the Conference Proceedings, after double peer review.

The conference Academic Committee members acted as peer reviewers for the full papers submitted. They were ATEE Conference Academic Committee members, RDC chairs and co-chairs, and Portuguese Academics belonging to universities that were running teacher education programmes.

Fifty nine full papers (51 related to paper presentations, and eight related to poster presentations) were submitted and 51 (43 related to paper presentations, eight related to poster presentations) were accepted to be included in the proceedings. Even though papers were submitted to a peer review process, the ideas conveyed by them as well as the language used are the papers authors' own responsibility. The papers are organised into two sections. The first one includes the papers from oral presentations that were submitted and accepted for publication. The second section includes the poster full papers that were also peer reviewed and accepted. Whatever the section, the full papers are organised by the order that was given to the papers and posters abstracts.

The organisers of the proceedings would like to express their gratitude to the Conference Academic and Organising Committees and to all the people, institutions and organisations that, in some way, sponsored the Conference.





## TABLE OF CONTENTS

### *Oral Presentations*

Teacher education in Portugal: a history of transitions <i>Rui Vieira de Castro</i>	3
Pre-service teachers’ perceptions of their roles, as contextualized within teachers’ professional performance standard set by ADEC <i>Rida Blaik Hourani</i>	15
Global perspectives in teacher education: a study of international practicum <i>Gerd Wikan &amp; Jorgen Klein</i>	27
Practicum as transition <i>Sirkku Männikkö Barbutiu</i>	37
Sustainable mentoring in kindergartens and schools: an equal partnership <i>Magne Jensen, Thorbjørn Karlsen &amp; Geir Luthen</i>	47
The changing role of deans in higher education: from leader to manager <i>Eystein Arntzen</i>	57
Mobile devices and development of learning strategies <i>Davide Parmigiani, Andrea Traverso, Valentina Pennazio, Alessia Olivieri &amp; Marta Giusto</i>	69
The interactive whiteboard as an artefact to support exploratory talk in primary school classrooms: a co-inquiry project between practitioners and researchers <i>Gerd Wikan &amp; Kari Nes</i>	81
The work context as a learning system: Transferring experiences from work life to Technical and Vocational Teacher Education (TVTE) <i>Birger Brevik, Arne Roar Lier &amp; Jan Wabø</i>	89
Impact of business education teacher programme on the twenty-first centuries’ teaching challenges in Nigeria <i>Udeme Isaac Akpan</i>	99
Academic essay as dynamic scientific writing: a developmental journey for students studying to become teachers in finding their professional identities <i>Lars Wallsten &amp; Åsa Morberg</i>	109
What was that all about? Transforming identities of schoolteachers as academics: a critical study of transition and meaning making <i>Doreen Rorrison &amp; Patricia Logan</i>	119
Practicum as a site of identity and efficacy development through participatory and enhancing conversations <i>Doreen Rorrison</i>	131

Teaching literacy, numeracy and ICT to adults: the basic skills programme (BKA program) for workers in building construction (bricklayers, carpenters and foundation workers) <i>John David Holt &amp; Kurt Einar Stokke</i>	139
Mathematics labs in teacher training <i>Anna Asti &amp; Maria Dedò</i>	149
Form tutors in the joint teaching of Music and collaborative work: perspectives and experiences <i>Fernanda Martins &amp; Teresa Sarmento</i>	155
Free 2be You and Me in education <i>Alba Alonso Feijoo</i>	163
What do the teacher training students see when they look and what do they say they see when they are out on the observation in school for the first time <i>Steinar Karstensen</i>	173
Playing with mathematics can be the successful way to teach it <i>Donatella De Tommaso &amp; Simonetta Di Sieno</i>	183
Motivations for choosing teaching as a career in biographical experiences of prospective teachers <i>Wanda Drózka &amp; Joanna Madalińska-Michalak</i>	193
The involvement and responsibility of principals and mentors in induction programmes <i>Nitza Schwabsky, Orna Schatz Openheimer, Judy Goldenberg &amp; Liat Basis</i>	205
Pre-service teachers’ perceptions of the support, challenges and opportunities associated with teaching out-of-field <i>Linda Hobbs &amp; Coral Campbell</i>	213
Information and communication technology in special education: to what extent does ICT support learning and participation for pupils seen to have special educational needs? <i>Terje Mølster &amp; Kari Nes</i>	225
Developing learning tasks in a technological learning workshop with LEGO mindstorms and additive manufacturing as main pedagogical tools <i>Birger Brevik &amp; Jon Ingar Holtet</i>	235
Investigating student teachers’ understanding of multicultural society <i>Liv Susanne Bugge &amp; Morten Løvteit</i>	245
Redesigning ourselves: who are we and who do we intend to become as visual arts teachers? <i>Ana Gonçalves de Sousa</i>	255
Promoting academic development through situated critical reflection <i>Cecília Guerra, Helena Pedrosa-de-Jesus, António Correia, Ângela Cunha, Adelaide Almeida &amp; Mike Watts</i>	267



Vocational and professional training of the teachers of natural sciences in Serbia between yesterday, today and tomorrow <i>Milan D. Stojković</i>	279
What do we mean by multicultural awareness? <i>Morten Løtveit &amp; Liv Susanne Bugge</i>	289
The programming studio: investigating teachers’ readiness for teaching programming in the Island of Ireland <i>Pamela Cowan, Elizabeth Oldham &amp; Ann FitzGibbon</i>	299
A desire to learn! Motivation for learning about science and technology among Norwegian pupils in upper secondary school <i>Heidi Regine Bergsager</i>	311
Transition of teacher in-service trainings and research teacher ambitions in Hungary <i>Magdolna Chrappán &amp; Rita Bencze</i>	319
Investigating representations of ratio among prospective primary teachers in Ireland: implications for teacher education <i>Elizabeth Oldham, Patsy Stafford &amp; Valerie O’Dowd</i>	329
Collaborative action research as teacher education strategy for conflict mediation in an early childhood context <i>Catarina Sobral &amp; Ana Paula Caetano</i>	341
The role of personal development in German early childhood training programmes <i>Janne Fengler, Alexander Röhler &amp; Stephanie Conein</i>	349
Emerging as early childhood teacher: critical challenges <i>Dalila Lino, Fátima Vieira &amp; Cristina Parente</i>	359
From learner to teacher: using reflection to develop mathematical teacher identity <i>Patricia Eaton, Christine Horn, Miriam Liston, Elizabeth Oldham &amp; Maurice O’Reilly</i>	367
Cultural characteristics in knowledge and explanation of the meaning of geometric transformation: implications for teacher education <i>Xhevdet Thaqi &amp; Joaquim Gimenez</i>	377
Who have I become? Transition of teachers’ identities through student-to-teacher violations <i>Børge Skåland</i>	385
Initial teacher education: a comparative study of two European higher education institutions <i>Filomena Rodrigues &amp; Maria João Mogarro</i>	395
Promoting teachers professional development through online collaborative research: the SoNetTe project and the Open Course Ware pupils’ questions and conscious ignorance in science education <i>Piedade Vaz-Rebelo, José Otero, Carlos Barreira, Júlia Morgado &amp; Paula Fernandes</i>	405

Transition of novice teachers into school teaching and their support by mentor teachers <i>Miluše Vitečková &amp; Zdenka Gadušová</i>	411
A teacher workshop for effective feedback <i>Jesuína Fonseca, Carolina Carvalho, Joseph Conboy, Ana Paula Gama, M<sup>a</sup> Odete Valente, M<sup>a</sup> Helena Salema, &amp; Edite Fiuza</i>	421
<b>Poster Presentations</b>	
Teaching models and elementary school teachers’ perspectives on teaching and learning science <i>Aparecida de Fátima da Silva, M<sup>a</sup> Eunice Marcondes &amp; M<sup>a</sup> de Fátima Paixão</i>	431
Formal and non-formal: writing in shades of green <i>M<sup>a</sup> Conceição Antunes &amp; Susana Margarida Caires</i>	439
“Back to the future”: science fiction as a part of teaching contents of natural sciences - a teaching idea from an ex-Yugoslav school <i>Milan D. Stojković</i>	447
Teachers’ professional learning and performance evaluation in different cycles <i>Helena Fernandes &amp; Piedade Vaz-Rebelo</i>	457
The role of monitoring classroom practice in the aim of educational service provision: analysis of results on 1 <sup>st</sup> cycle of the external evaluation of schools <i>Margarida Amaral, Graça Bidarra &amp; Piedade Vaz-Rebelo</i>	463
Educational support in the light of school external assessment <i>Raquel Batista de Oliveira, Graça Bidarra &amp; Piedade Vaz-Rebelo</i>	469
Prospective science teachers’ views of Problem-Based Learning <i>Sara Moutinho, Joana Torres, Raquel Martins &amp; Clara Vasconcelos</i>	475
“The social contract”: on university teacher professionalism, structure, and agency <i>Mai Trang Vu</i>	483



## **ORAL PRESENTATIONS**



## **Teacher education in Portugal: a history of transitions**

*Rui Vieira de Castro*

*Research Centre in Education - University of Minho, Portugal*

rvcastro@ie.uminho.pt

### **Abstract**

Teacher education is a field of great complexity, as it is shaped by the activity of diverse agencies that are not always convergent. Teacher education complexity has to do with the different levels that it is made of: policies, practices, theories, beliefs, processes, outputs are all components of a multi-dimensional field of practices and inquiry. Besides, State structures, political, social and economic organisations, educational institutions, teachers and teachers associations, all contribute to the existence of sometimes radically distinct ways of thinking and carrying out teacher education. In Portugal, teacher education is highly regulated by the State. Thus, the field is very sensitive to changes in State education policies concerning, for instance, relevant educational objectives, the legitimate curriculum, students' desirable knowledge and skills and intending teachers' professional profiles. This paper discusses some of the main changes that occurred during the last decades, in Portugal, in the field of teacher education policies.

**Keywords:** educational policies; teacher education; transitions.

### **Introduction**

Teacher education is a field of great complexity, as it is shaped by the activity of diverse agencies that are not always convergent. State structures, political, social and economic organisations, educational institutions, teachers and teachers associations, each of them carrying, very often, different or even contradictory perspectives, all contribute to the existence of sometimes radically distinct ways of thinking and carrying out teacher education. Besides, teacher education complexity has to do with the different levels that it is made of: policies, practices, theories, beliefs, processes, outputs are all components of a multi-dimensional field of practices and inquiry.

The perspective that is adopted in this paper will envisage above all education policies concerning teacher education - a topic that I would like to explore both at State level and that of higher education institutions (HEI). The focus will be on these policies, the contextual circumstances and the intellectual debate in which they are (or were) formulated rather than on the outputs of their implementation.

One argument to justify this approach is the fact that, in Portugal, teacher education is highly regulated by the State. Thus, the field is very sensitive to changes in State education policies concerning, for instance, relevant educational objectives, the legitimate curriculum, students' desirable knowledge and skills and intending teachers' professional profiles.

### **Aim**

Taking into consideration pre-service and in-service teacher education policies, as they are designed by legislation and official regulations, as they are developed in HEI, and as they are analysed in the academic field, the questions to be addressed are the following: What is the historic background of teacher education in Portugal?; How did it evolve until it became a consolidated field in higher education?; What are, in Portugal, the main characteristics of the teacher education system?; What are the current trends and the perspectives for future development?

In summation, the aim is to discuss some of the main changes that occurred during the last decades, in Portugal, in the field of teacher education policies, by pointing out the milestones of that period.

## **Evolution of Teacher Education in Portugal**

This section of the paper is organised in four parts. The first part will retrace the first steps of teacher education in Portugal during the 19<sup>th</sup> and the 20<sup>th</sup> centuries. The second part will focus on some of the main aspects of the policies and practices, which structured teacher education up to 1986, when the Education Act (Lei de Bases do Sistema Educativo) was approved by Portuguese National Parliament. The third part will concentrate on the changes that teacher education has encountered after the Education Act, by identifying the tensions and shifts that teacher education knew. Thus, the most relevant State regulations, considering their meaning in the context of the history of teacher education in Portugal, as well as the institutional policies will be analysed in some detail. Finally, part four will focus on some of the emergent trends, which will probably reshape the future of teacher education. For this last purpose, in order to scrutinize the different perspectives operating in the field of teacher training, connections and disconnections between theoretical perspectives and formulated policies will be discussed. The major concern is to develop a reflective and speculative approach about teacher education, anchored in the Portuguese situation.

### ***Teacher education in Portugal during the 19<sup>th</sup> and the 20<sup>th</sup> centuries***

In Portugal, teacher education has a history. So it has had intellectual inquiry about it. This history goes back to the middle of the nineteenth century, if we consider primary education, when the institutionalisation of teacher education began - a process finally consolidated in the first years of the twentieth century. In these first years of the 20<sup>th</sup> century one can find too, at the level of the State policies, a consistent concern with teacher education of post-primary teachers, although it was not uncommon throughout the previous century to find official statements on the issue of these teachers recruitment.

After the reform of 1901 it became mandatory for the primary teacher to be educated at “Normal Schools”. When in 1901 Higher Education Courses on the Humanities (Cursos Superiores de Letras) were initiated, although they were created almost fifty years before (1858), pedagogic knowledge became institutionalised at the level of higher education, along with content knowledge and pedagogic practice<sup>1</sup>.

When the universities of Porto and Lisbon were established, after the republican regime was installed in 1911, the Higher Education Courses on Humanities were substituted by the Higher Normal Schools (Escolas Normais Superiores) that were schools associated with the Faculties of Letters and of Sciences, which were oriented to promote teacher education. The aim of these schools, as stated by Dec. 21.5.1911, was said to be “fostering the high pedagogic culture” and to prepare teachers for High Schools (Liceus) and for Normal Schools (Escolas Normais).

In 1930, these Higher Normal Schools were superseded by Departments of Pedagogical Sciences (Secções de Ciências Pedagógicas), created at the Faculties of Letters in the Universities of Lisbon and Coimbra (Decree Law 18.973, 16<sup>th</sup> October 1930). Here, the initiation to professional practice was guaranteed by a practicum to be developed in some specific High Schools (Liceus Normais).

However, the reform of the Faculties of Letters that took place in 1957 made evident the fact that teacher education had not reached yet a stable status in the context of higher education. The legislator acknowledges that those Faculties had, as one of their main aims, the preparation of teachers for “secondary education”. However, at the same time, it was stated that this orientation was demanding mainly at the level of the content to be taught to secondary education students and the field of practices, i. e the High School, actually was considered to be the adequate context for the future teachers to face the challenges raised by the teaching profession.

A new shift occurred no more than fifteen years later after the creation of the Minor in Teacher Education in the Faculties of Sciences of the Portuguese universities (Nova Lei Orgânica das Faculdades de Ciências, Decree Law 443, 23d October 1971). Although the rationale is of a cumulative nature, this new Law promoted the integration of the different dimensions of teacher education - content knowledge, pedagogic knowledge and teaching practice - under the responsibility of the same (higher education) institution.

This movement, aiming at the reinstallation of teacher education in the university, was strongly established in 1973, after the creation of the so-called New Universities, where the programmes of teacher education were going to be of great relevance.

### *Policies and practices which structured teacher education up to the 1986 Education Act*

In the middle of the seventies of the last century, in the context of the transition to democracy, after almost half a century of the authoritarian regime of Salazar and Caetano, the Portuguese education system knew sudden and very important changes that were going to radically affect its configuration.

Democracy meant huge changes concerning, among other matters, the objectives of the education system, the forms of organization and administration of schools, the curriculum of basic and secondary education, modalities of adult education and higher education.

Under the new political, social and economic conditions the increase in demand for education was enormous. Social and individual expectations of a better life, beliefs about the effective impact of education in economic development<sup>2</sup>, the collective aspiration to access knowledge and culture, all contributed to an extraordinary increase in the levels of attainment in basic and secondary education. The political motto “to develop and to democratise” found an almost natural field of implementation in the development of the education system.

The number of students attending compulsory regular education, increased rapidly during the period 1970-1990, from 1.13 million to 1.59 million, as can be observed in Figure 1.

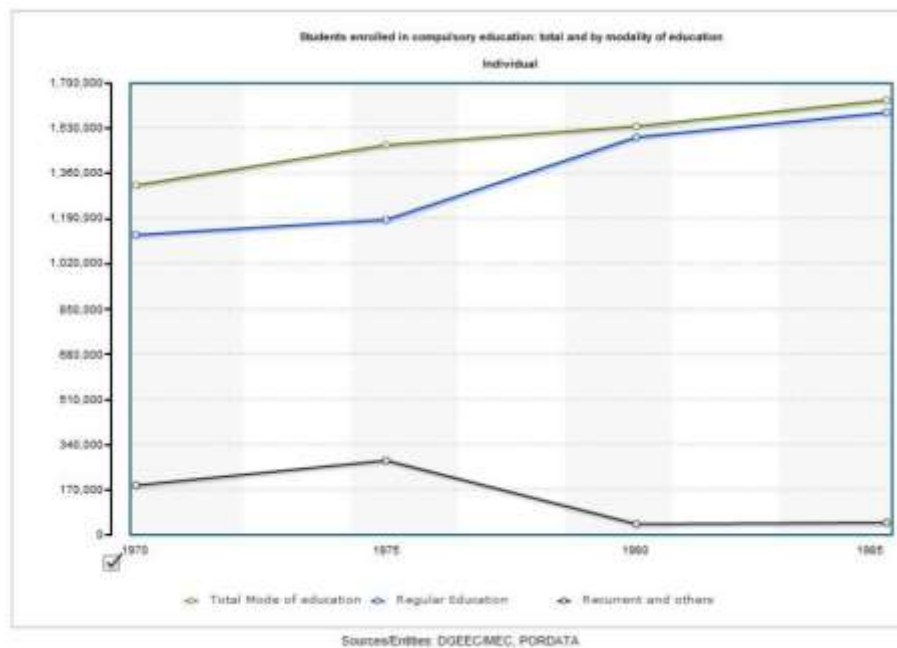


Figure 1. Evolution of the number of students attending compulsory regular education (1970-1990)

Besides other additional effects, the increasing number of students attending basic and secondary education put a great pressure on teacher education. During the second part of the seventies and first years of the eighties, the Government needed very often to recruit young teachers among higher education students, who sometimes were initiating their bachelor degrees. Figure 2 shows the evolution, throughout the years 1970-1990 of the number of teachers of the different educational levels.

Teacher education became a central issue in the formulation and development of education policies, both at State and institutional levels, as it was understood that the quality of education could not be considered separate from the quality of teacher education.



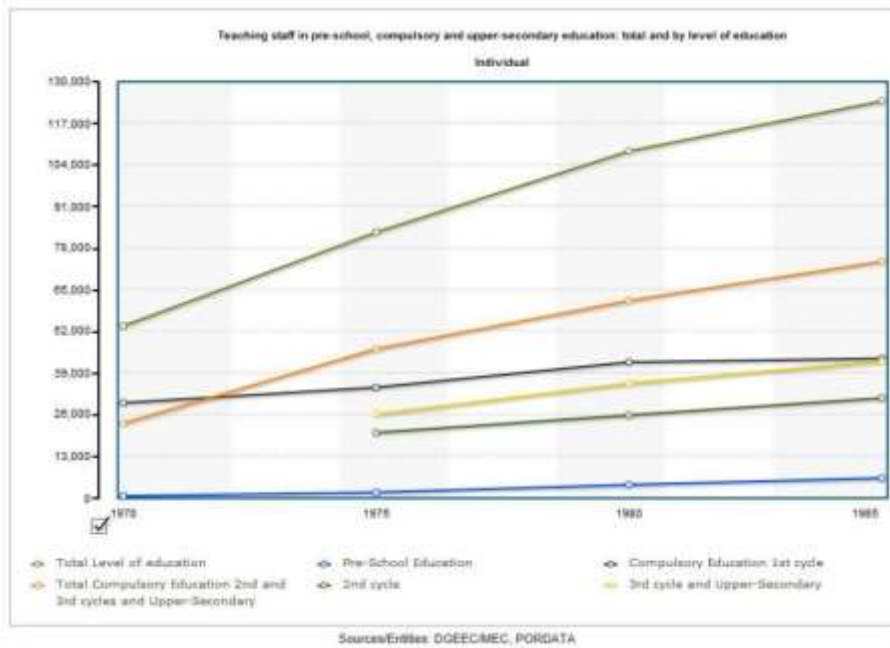


Figure 2. Evolution of the number of teachers of the different educational levels (1970-1990)

For many decades, before the changes I am now referring to, teacher education was developed in two different modes, depending whether primary school teachers or secondary education teachers were at stake.

Primary education teachers used to be educated at post secondary, non-higher education institutions, after the applicant completed, first, nine years and then eleven years of schooling. Secondary education teachers were educated at universities, in the context of non-teaching oriented degrees, which could be later on complemented by attendance at programmes focused on educational and pedagogical issues.

In the new circumstances emerging from the democratic changes, these models were submitted to a deep revision, which occurred under the influence of international trends. This fact was also favoured by the foundation of new universities that identified teacher education programmes, as a major area of intervention.

With respect to the education of non-primary school teachers, the debate argued over two main models, the integrated and the sequential. The prevalent tradition in pre-service teacher education was of a sequential nature. After being awarded a degree in a specific academic field, e.g., Language and Literature, History, Geography, Mathematics, Physics, etc. - the prospective teacher had to follow a “pedagogical programme” in order to get a professional qualification. This programme could be developed exclusively in basic or secondary schools, as a Practicum, or, as it happened later, it could be a university programme composed mainly by subjects in the field of education - Psychology, Curriculum, Teaching Methodologies, plus a Practicum.

In the integrated model, three components coexist(ed) throughout the programme: knowledge of the content area, pedagogical knowledge, and pedagogical practice. This model has some interesting characteristics, which were the basis for its long lasting history: the idea of preparing a professional specialist, the idea of involving all the relevant academic fields to qualify a teacher in an articulated way and the idea of teacher education, as a specialised project.

This model achieved a significant success, supporting the qualification of a large number of teachers with pedagogical qualifications in different subject areas, with a significant impact in the schools as it favoured productive interactions with their different actors and levels of the organisation.

The way that these two models evolved was not exempt from tensions in the interior of the institutions and, in general terms, in academia. Actually, it was not uncommon for those involved in its implementation to reveal a scarce identification with them. In some of our universities and,

within them in certain faculties, the development of teacher education projects was always involved in great turbulence.

By the end of the seventies, when - in the context of several changes in the Faculty of Letters of the University of Lisbon - the mission of the Faculty was under debate, António José Saraiva, one of the most prominent professors of that Faculty and an influential intellectual of the time, wrote:

“the Faculty of Letters is not a professional school [...]. The Faculty of Letters contains in its field several subjects, which have as a dominant characteristic belonging to the branch of the so-called human sciences; some of these subjects are essential to certain professions (to be an educator, diplomat, librarian, cultural mediator, psycho-therapist, etc.); others have as a main purpose their own practice (v. gr. archeology) in the context of a career of free researcher. Thus we can classify it as a school that transmits knowledge and methods not immediately applicable in a professional career” (Saraiva 1979, 209).

In this perspective, the Faculty of Letters is seen as a school “which determines itself in terms of a certain field of knowledge and not as a function of a professional activity” (209).

The paper I am quoting, in its radicalness, assumes perspectives that, even if not with this same degree of structuring and intensity, could be recognised in multiple voices in the academia in strong tension with other positions and practices. Actually this debate was taking place at a moment when, as I mentioned before, the Minor in Teacher Education had already been created in the Faculty of Sciences of the same University of Lisbon.

In summation, the first decade of democracy was the time of a very intense debate about teacher education, whose main features can be outlined as follows:

- teacher education became an issue of major concern in the context of the formulation and implementation of education policies;
- teacher education was considered as a main answer for supporting in an effective way the huge increase of the levels of attainment at basic and secondary education and for the needs of increasing the quality of formal education;
- teacher education was implemented under different competing models, with different rationales and objectives, in a large variety of institutions (public, private, HEI, non-HEI, university schools, polytechnic schools);
- new models of teacher education were being developed, more oriented to assure a specialised professional profile.

The years from 1976, when the Portuguese Parliament approved the new democratic Constitution, to 1986 represent a period during which all the actors, organisations and institutions involved with education aimed at the redefinition of the education system, through political processes of high intensity.

The agenda of education policies included as main topics, among others, compulsory education, basic education structure and curriculum, students’ assessment, schools organization and management, teacher education, teachers’ career, adult education, participation of parents in the life of the schools and access to higher education.

The end of this cycle is in some sense marked by the approval of the Education Act in 1986 by the Portuguese Parliament, which gave an almost consensual answer to most of the educational issues raised at that time (Pires 1987).

### ***Changes in teacher education after the Education Act***

By the end of the eighties and the first years of the nineties after the approval of the Education Act (Law 46/86) and some complimentary regulations (Decree-Law 344/89 and Decree-Law 2549/92), the legal framework was completed and Portugal got a structured system of teacher education including pre-service education, in-service education and specialised education.

From the approval of Decree-Law 344/89 onwards pre-service teacher education only could be implemented at higher education institutions. Four main objectives were attributed to teacher education:

- personal and social development, aiming at the development of attitudes such as reflection, autonomy, co-operation and participation;
- the acquisition of relevant knowledge in the content areas;
- the acquisition of pedagogical knowledge; and
- the development of abilities concerning critical analysis, innovation and pedagogical research.

It became mandatory in the curriculum of pre-service teacher education the existence of curricular components related with content areas, with pedagogy and with teaching practice; different weightings of each component according to the kind of teacher at stake were established.

Specialised teacher education was introduced through post-graduation courses, aiming at preparing teachers for the performance of specialised pedagogic and management tasks demanded by the education system (pedagogic supervision; schools management; inspection; adult education, among others).

In service teacher education became considered not only a right but also a duty for all teachers in order to foster professional development, as well as applied research and the dissemination of educational innovation and specific structures at the level of State were created to deal with this dimension of teacher education.

Decree-Law 2549/92 established the legal framework for in-service teacher education, formulating its principles, areas, modalities and levels. The improvement of the quality of education appeared now, as the main objective. The privileged areas included sciences of education, sciences corresponding to content areas, pedagogical research and practice, Portuguese language and culture and the technologies of information and communication. Different modalities could be adopted – from courses to workshops or study circles. The HEIs, school networks and professional associations were considered the privileged loci for development of in-service education. These different actions needed to be accredited by a State agency and the resulting credits are relevant for professional evaluation and progression.

Although the legal framework for teacher education reached a point of stability in the first years of the nineties, in the process of its appropriation there were always tensions inherent to the fields of practices, where the regulations could be redefined and developed in specialised ways. Actually, inside the universities and polytechnic schools, where teacher education in Portugal takes place, diverse (sometimes radically diverse) conceptions about teacher education kept coexisting and very often opposing each other. In spite of this, it is true that we can identify some tendencies that go beyond peculiarities of time and space.

In a paper published in the middle of the nineties, which aimed at contributing to the evaluation of the experience of teacher education programmes and looked back to what were the main trends in teacher education in a diachronic perspective, I and other colleagues identified five main tendencies that were oriented towards:

- the integration of the main components of education (content knowledge, pedagogic knowledge and initiation to professional practice);
- the specialisation of teacher education programmes in the context of higher education teaching programmes;
- the harmonisation of the theoretical dimension of the universities with the “practical” dimension of the schools;
- the option for an early vocational choice; and
- the recognition of the added value of the teacher education programmes developed under the principle of unity (Lima, Castro, Magalhães, and Pacheco 1995).

However, teacher education was going to be confronted very soon with changes of major impact caused by factors internal and external to the field. These changes had to do with education policies, with new trends in the academic fields dealing with teacher education, and also with demographic variables.

Let us consider briefly the meaning of these changes taking into consideration mainly pre-

service education.

The introduction of several changes throughout the last few years of the nineties made a contribution to the reconfiguration of teacher professional profiles, eventually creating new challenges for teacher education. Campos (2000) identifies as the main changes:

“the setting out of nation-wide curriculum guidelines for pre-school education (...); (ii) the setting out of essential competencies to be achieved by students at the end of each cycle of basic education and to be evaluated in national examinations; (iii) the creation of cross-curriculum themes [...]; (iv) the creation of project areas, which imply alternative methodologies in relation to the most common ones; (v) a deeper emphasis on the role to be played by students’ learning formative evaluation, as a central element of the teaching process organisation; (vi) the increasing autonomy of schools, [implying] local development of the national curriculum, school self-evaluation and deeper connection to community members and institutions; (vii) encouragement of the introduction of information and communication technologies into the teaching process; (viii) the promotion of experimental teaching [...]; (ix) the setting out of more ambitious learning outcomes [...] (x) the adoption of aims related to the European dimension of education.”

By this time, in many countries, governments were launching important “systematic” reforms of education - “in their different ways, many of them see the reform and progressive management of teacher education as a key component in that systemic reform process” (Furlong, 2013). As this same author points out, “teachers are now seen as the key resource in ensuring the global competitiveness of each nation state’s education service. How teachers are selected, trained, and developed as professionals are now essential concerns for every national educational system that wants “to come out on top”.

The emergence of a new professionalism, which Hargreaves (2008) suggested was of a “post-professional” nature, could be identified. Portuguese teachers were then placed in the middle of very complex and demanding political and educational processes, which aimed “to reorientate the strong liberal-humanist traditions of schooling, characterised by a belief in the intrinsic, non-instrumental value of education towards a more functional view characterised by competency based, results driven teaching” (Day 2002).

As happened in many other countries, teachers started experiencing “government interventions in the form of national curricula, national tests, criteria for measuring the quality of schools and the publication of these on the internet in order to raise standards and promote more parental choice” (Day 2002).

Although it was never explicitly stated in these terms, it is as if “teachers can - and should - teach all students to world-class standards, serve as the linchpins in educational reforms of all kinds, and produce a well-qualified labor force to preserve the nation’s position in the global economy” (Cochran-Smith 2008).

The impact of this new professionalism in Portugal has been so far mitigated by the fact that teacher education is not, in its content and methodology, directly regulated by the State, although higher education institutions cannot ignore the changes occurring in the teaching profession.

One can always admit that as John Furlong (2005) states, the “re-modelling professionalism remains a key objective”, although “the site for reform has shifted from individuals to the state and, to a lesser degree, to schools. The state has taken a much more assertive role in defining how to teach as well as what to teach; the result has been the establishment of what I would term a more “managed professionalism”.

Meanwhile, facts of a different nature had an important impact on teacher education. In the last few decades Portugal knew significant demographic changes - between 1990 and 2013 the numbers of the resident population in the age group from 0 to 14 declined from 2, 03 to 1,5 millions, which means a loss of around 25% in 23 years, even if during this period the total resident population increased around 5%.

In the same period the number of students enrolled in pre-school, basic and secondary education fell from around 1.5 million to around 1.1 million, as can be observed in the Figure 3.

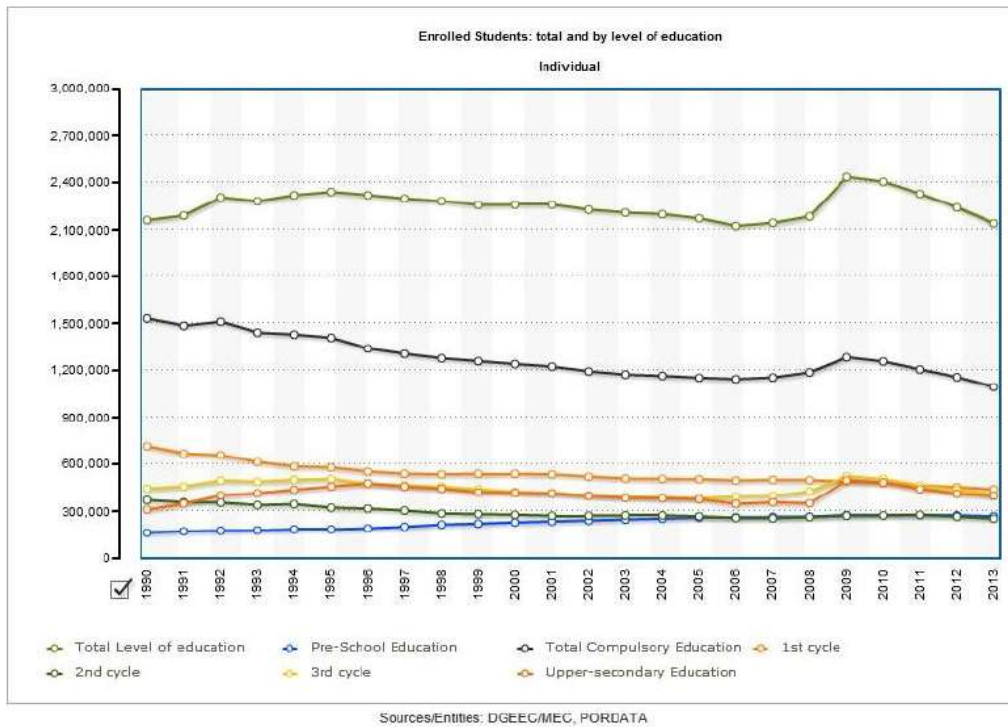


Figure 3. Evolution of the number of students (1990 – 2013)

Meanwhile, the number of teachers, which increased consistently until 2005, suffered a severe reduction, as it can be seen below, as a result of the decrease in the levels of enrolment and of education policy measures affecting, for instance, the average number of students per class or involving the suppression of cross-curricular areas of teaching (Figure 4).

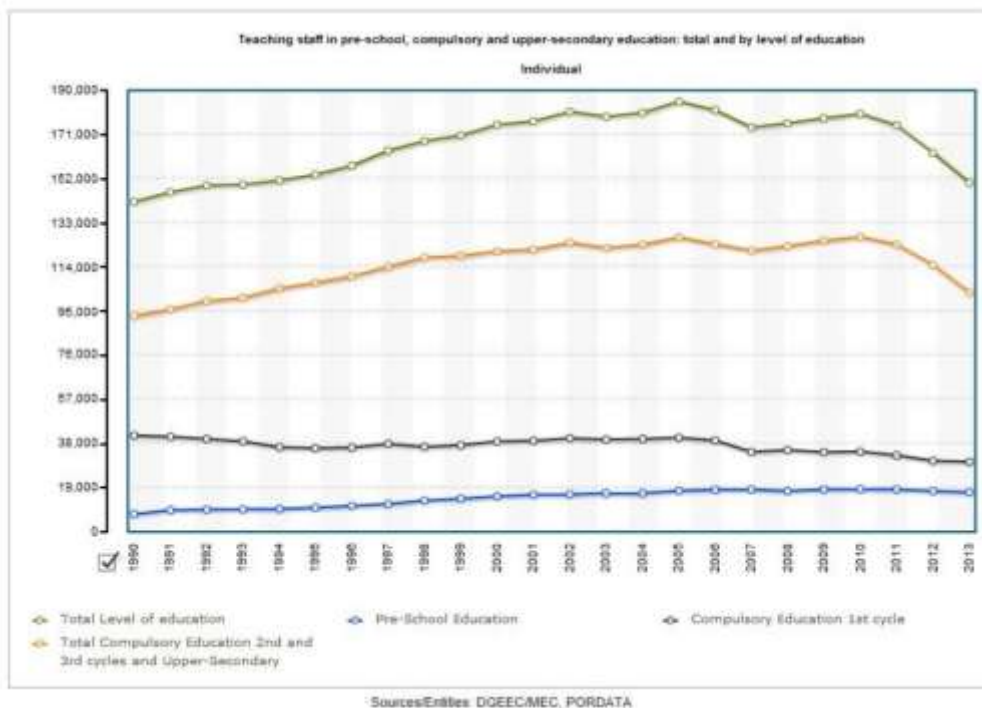


Figure 4. Evolution of the number of teachers (1990 – 2013)



In this period, the number of unemployed teachers saw a significant increase, thus putting an enormous pressure on the State - the main employer of this labour force - and, at the same time, the main promoter of teacher education in Portugal in Portugal (around 86% of the 150 000 employed teachers).

From 1997 to 2013 the number of teachers registered in the Employment Offices increased from 1.275 to 12.741, which means around 1000% more.

However, and in this respect, the picture is very contradictory, since the percentage of students in secondary education is lower than the European average, since the number of students finishing their secondary education represents less than 40% of the total of students enrolled and there is a high rate of retention at this level.

As a result of this conjunction of demography trends, labour market situation and, accordingly, negative perceptions about the employability of the teaching profession, pre-service teacher education, programmes lost attractiveness and became less relevant for higher education institutions.

### ***Emergent trends which will probably reshape the future of teacher education***

It is widely accepted that for Portugal, the quality of education is still a main challenge. Taking into consideration, among other things, the levels of attainment of secondary education, repetition and dropout rates all through the education system, the results of international comparative assessments, as is the case with PISA, in spite of the impressive achievements of the last three decades, Portugal has still a long way to go.

This is something that will not be achieved without a pre-service and in-service teacher education of high quality.

The new circumstances defined by the reconfiguration of the education system, the mandates with which the school is politically and socially invested, the decrease of social attractiveness of teacher education programmes, the current characteristics of the teaching profession, with the on going redefinition of the sphere of teacher activity, the recent changes in higher education in the context of the Bologna process, which introduced new principles and rules, and the demographic changes, all demand a wide debate about teacher education, which should not disregard our previous experiences with all their successes and failures.

These new challenging circumstances, which are still changing, represent an opportunity to rethink teacher education. Some topics, in my perspective, should support the examination of the subject, namely the institutional reevaluation of teacher education, the nature of the project of teacher education with the involvement in it of the different academic fields, the design of the curriculum and the corresponding methodologies, and the role of research in teacher education.

The increasing number of teaching projects and the academic field specialisation, on the one hand, and the effects of the exhaustion or at least of the limitations of the current projects on teacher education not only anticipated but already felt, on the other hand, constitute the basis of what can be described as a lack of investment on teacher education in our institutions. Of course, as Marie Brennan and Sue Willis (2008) say “the field of teacher education cannot easily comply with the new fiscal climate for the overall sector: it does not bring in large international student numbers, it does not attract large research income, and economies of scale in teaching are difficult”. However these programmes play a relevant role as the mission of public universities is taken into account, they bring an important number of students to our institutions and they are essential to maintain relevant academic activity in teaching and research.

For this reason, a major issue to deal with is the re-establishment of the institutional commitment to teacher education, as a socially and academically relevant teaching project. This new commitment, on new basis, is a matter for all the academic fields. Too often, as I see it, teacher education is considered in instrumental terms more than valued in its own right. The academic fields involved in it seem sometimes more concerned with the extension of their academic areas of influence and with the control of projects than with the development of the projects and their outputs and the field of education studies is not immune to this trend.

Teacher education needs to be considered as a specialised project with specialised teaching

projects inside it, which involve several academic fields in different degrees. In the Portuguese teacher education system we have the following teacher profiles:

- Pre-school education (3-6 years of age, non compulsory): single class teacher; this profile can be obtained together with the one corresponding to basic Education, 1<sup>st</sup> cycle;
- Basic Education (compulsory for 6-15 years of age): single class teacher for the first cycle; subject teachers for the 2<sup>nd</sup> and 3<sup>rd</sup> cycles; the last profile can be obtained together with the one corresponding to Secondary Education;
- Secondary Education (compulsory for 15-18 years of age): general education and vocational courses taught by subject teachers.

The definition of professional teaching qualifications to be guaranteed through pre-service teacher education is largely determined by the scope of the future activity of the teacher. Thus, the intervention of the different academic fields varies according to the profile at stake, as the curriculum will also vary.

This will imply the resumption and extension of the debate that is always fiercely contended by the different academic fields involved in these projects - from education to humanities and arts, from social sciences to earth and life sciences. Maybe this debate, which in the past had moments of very heated discussions, can find in the current circumstances a more favourable scenario, precisely because teacher education projects are not so critical for most of the academic areas involved.

To have teaching education implemented through specialised projects means to have not only a specialised curriculum, but also specialised ways for its development. It is a matter of consensus that there is the need for having in the curriculum of pre-service teacher education, a meaningful presence of subjects of the content areas and about education; when I say meaningful I do not mean of encyclopaedic nature. If it is true that such curriculum should not coincide with the legitimate knowledge of basic and secondary education, it should not be seen either as the locus where all the available knowledge in the intervening academic fields is negotiated. One needs to be aware all the time that, on one hand, what is at stake is teacher education and not the qualification of mathematicians, linguists or school administrators and that, on the other hand, we are talking about pre-service teacher education, a modality, which cannot be viewed apart from in-service teacher education.

In the development of the curriculum, the possibility of exploring teaching methodologies congruent with those to be adopted by the students in their future professional contexts seems to be of particular relevance.

Some authors claim the need of a teacher education anchored in the work of the most experienced and recognised teachers, a teacher education developed inside the teaching profession (Nóvoa 2010). Others alert towards the risks of the “unprecedented moves to school-based and school-led teacher education” (Childs 2013).

The multi-dimensional nature of teacher education needs to consider the Practicum, as a relevant dimension. Usually this dimension is undervalued and mainly understood, as a locus of application and evaluation. However, in a distinct perspective the Practicum can be understood to be decisive for developing the professional profile, as well as a locus of integration and discovery of different types of knowledge.

To perform this objective, it is needed, in the context of teacher education, to assure the convergence between higher education institutions and basic and secondary schools. The latter are often seen as a kind of laboratory, where the future teachers are tested. One effect of this practice is that those schools, where the first access to the profession takes place, are left aside the formation process and eventually future teachers work on a very limited and partial reality, as they are kept away from a very meaningful set of contexts, functions and practices.

Let us now consider the relevance of research in teacher education. In some national contexts, teacher education is required to be research based, supported by evidence (Cochran-Smith 2008). Teacher education, as research object is multiple in its dimensions, as it allows for several levels of inquiry, from teaching practices to learning outcomes, from policies to curriculum, from

beliefs to decision making. Research on teacher education can play a relevant role by contributing with new meanings to teacher education policies and practices and to sustain decision-making processes at all levels and by all the actors involved.

### Concluding remarks

Of course some of the issues discussed above “are not matters of evidence, but of values, priorities, and trade-offs” (Cochran-Smith 2008), and “decisions about policy and practice are inevitably mediated by moral, ethical, and political considerations whether acknowledged openly or not” (Zeichner 2010).

However research can offer relevant contributions to prevent the so common forward and backward movements in the development of teacher education, which, in the end, will negatively affect the quality of the education provided to the young generations.

Marilyn Cochran-Smith (2008) once proposed a dystopia; she wrote “One possible scenario for the not-so-distant future is a teacher education system [...] aimed entirely at boosting pupils’ annual test scores with incentives for the winners and severe sanctions for the losers. [...] only teacher educators operating on the radical fringe would pay attention to theory, democratic ideals, or social justice since these do not translate easily into test scores, and it would be assumed that the public was the sum of each individual’s private interest. In this brave new world of teacher education, there would be a proliferation of forprofit providers of teacher education who concentrated on test preparation, a much decreased interest in teacher preparation for urban and other diverse schools (since their pupils’ scores are much harder to budge), and increased difficulty staffing schools with poor, minority, and immigrant students”.

It is in our hands, it is an undeniable mission of all of us, teachers, teacher educators and researchers to prevent this dehumanized scenario to become real.

### Endnotes

- 1-History of Pedagogy, Methodology of Secondary Education and Pedagogy of Secondary Education were some of the pedagogic components of teacher education.
- 2-The theory of human capital was at several levels the intellectual support both of the expansion of the levels of attainment and the dualism of the education system. The Mediterranean Regional Program (1959-1964), developed within the framework of OECD, supported the rise of these issues in the Portuguese education policies agenda, although its effective influence seems to have been scarce (Teodoro, 2000). However, at least in rhetorical terms, that approach kept its supportive role for a long time.

### References

- Campos, B. 2002. *Políticas de Formação de Profissionais de Ensino em Escolas Autónomas*. OPorto: Afrontamento.
- Childs, A. 2013. “The work of teacher educators: an English policy perspective.” *Journal of Education for Teaching: International research and pedagogy* 39(3): 314-328.
- Cochran-Smith, M. 2008. “The new teacher education in the United States: directions forward.” *Teachers and Teaching: theory and practice* 14(4): 271-282.
- Correia, J., and M. Matos. 2001. “Da crise da escola ao escolocentrismo.” In *Transnacionalização da Educação. Da crise da educação à “educação” da crise* edited by S.Stoer, L. Cortesão, and J. Correia, orgs.. OPorto: Afrontamento.
- Day, C. 2002. “School reform and transitions in teacher professionalism and identity.” *International Journal of Educational Research* 37: 677-692.
- Furlong, J. 2005. “New Labour and teacher education: the end of an era.” *Oxford Review of Education* 31 (1): 119-134.
- Furlong, J. 2013. “Globalisation, Neoliberalism, and the Reform of Teacher Education in England.” *The Educational Forum* 77 (1): 28-50.

Licínio Lima, L., R. Castro, J. Magalhães, and J. Pacheco. 1995. “O modelo integrado, 20 anos depois: Contributos para uma avaliação do projecto de Licenciaturas em Ensino da Universidade do Minho.” *Revista Portuguesa de Educação*, 8 (2):

Marie Brennan, M., and S. Willis. 2008. “Sites of contestation over teacher education in Australia.” *Teachers and Teaching: theory and practice* 14 (4): 295-306.

McNicholl, J., V. Ellis, and A. Blake. 2013. “Introduction to the special issue on the work of teacher education: policy, practice and institutional conditions.” *Journal of Education for Teaching: International research and pedagogy* 39 (3): 260-265.

Nóvoa, A. 2002. “O espaço público da educação: Imagens, narrativas e dilemas.” In *Espaços de Educação, Tempos de Formação* edited by A. Prost et al.. Lisbon: Fundação Calouste Gulbenkian.

Nóvoa, A. 2009. *Para uma formação de professores construída dentro da profissão*. [www.revistaeducacion.mec.es/re350/re350\\_09por.pdf](http://www.revistaeducacion.mec.es/re350/re350_09por.pdf)

Pereira, F. 2013. “Concepts, policies and practices of teacher education: an analysis of studies on teacher education in Portugal.” *Journal of Education for Teaching* 39 (5): 474-491.

Saraiva, A. 1979. A vocação das Faculdades de Letras. *Raiz e Utopia*, 9/10.

Zeichner, K. 2010. “Competition, economic rationalization, increased surveillance, and attacks on diversity: neo-liberalism and the transformation of teacher education in the U.S.” *Teaching and Teacher Education* 26 (8): 1544-1552.

[Back to contents](#)

## **Pre-service teachers’ perceptions of their roles, as contextualized within teachers’ professional performance standard set by ADEC**

*Rida Blaik Hourani*

*Emirates College for Advanced Education, United Arab Emirates*

rhourani@ecae.ac.ae

### **Abstract**

Schools in Abu Dhabi are going through a period of education changes and reforms. The Abu Dhabi Education Council (ADEC) focuses on improving quality of teaching-learning. Performance standards for teachers have been constructed in light of school reforms. This study was conducted to explore pre-service teachers’ perceptions and understanding of their professional roles and responsibilities within the context of ADEC performance standards. The researcher has employed qualitative and quantitative research methods to conduct this case study. Findings revolve around pre-service teachers’ perception of their areas of strengths and weaknesses as novice teachers. Recommendations are within the realm of areas of improvement and the scope of ADEC’s performance standards, set for teachers. Findings revolve around initiating and creating a support system and professional development plan for novice teachers in Abu Dhabi public school system.

**Keywords:** teachers’ education; performance standards; pre-service teachers; teachers’ roles and professional attributes.

### **Context of the research**

As indicated by the Ministry of Education, the education system in the UAE has been undergoing transformation. The biggest challenge is in the area of educational reforms and reinventing the wheel for the educational system, in terms of curriculum, pedagogy school management, educational leadership and teachers’ training (ADEC 2008).

Education reforms in Abu Dhabi have been taking place since 2006, through the Ministry of Education and Abu Dhabi Education Council (ADEC) which is a nonfederal government authority. ADEC is working hard to enable Emirati students to emerge from quality school education and to pursue further higher education (ADEC 2008). Within the scope of school reforms, the role of teachers has gone through changes and new expectations. The transformative role of teachers has been conceptualized within global outcomes encompassing approaches to learning and lifelong implicit and explicit learning outcomes. Within the context of Abu Dhabi, The New School Model recognizes that learning is much more than knowing and remembering facts. In addition to academic outcomes, the New School Model developed positive approaches to learning which will enable students to be academically successful and to become lifelong and independent learners (ADEC 2010).

As part of the school reforms, the New School Model (NSM) was launched in September, 2010. The NSM is claimed as, “a new approach to teaching and learning to improve student learning experiences and to raise academic outcomes of Abu Dhabi students to the internationally competitive level necessary to achieve the Abu Dhabi economic vision 2030”<sup>1</sup> The NSM has been implemented starting 2010/2011 across Kindergarten to grade 3 at Abu Dhabi government schools and progressively applied to all cycles. Within the NSM agenda and policies, community involvement and communicating with parents were stipulated.

Novice teachers go through a transformative phase, from being student-teachers to becoming fully fledged teachers. ADEC aims at preparing and training Emirati teachers to build a national human capacity within the education sector. Emirates College for Advanced Education (ECAE) as a partner with ADEC is the first and only teachers’ college in the UAE, though education departments exist in a few higher education institutions in the UAE. ECAE is licensed by the Commission for Academic Accreditation, Ministry of Higher Education and Scientific Research. The College was created in 2007. The participants in this case study were B.Ed-4, ECAE Pre-



service-student-teachers (PSSTs). The ECAE teacher education program provides internship and practicum for PSSTs under the guidance of college mentors and school mentors. The practicum takes place during the first 3 years of the B.Ed. study and the internship takes place during the last semester (year four). During year one, PSSTs do three weeks of observations in their second semester. In year two PSSTs do three weeks of observation and teach part of a lesson. In year three PSSTs do five weeks of practicum-observations and teaching and in year four, ten weeks of internship is required, along with an action research project.

### **Research aim**

The implication of this study is to enable PSSTs to examine their perception of their future roles as teachers; in light of ADEC’s “Professional Performance Standards”. The research aims at enhancing effective PSSTs professional preparation, through helping PSSTs explore their professional weaknesses and strengths, by means of self-reflecting in light of “ADEC Teachers’ Performance Standards”. The research will assist: (1) PSSTs to explore and self-assess their professional attributes, in order to improve and develop in their eventual roles as teachers, in Abu Dhabi Public schools and (2) help teachers’ educators identify the professional performance areas that PSSTs have difficulty with in order to provide support and development in certain performance areas. Hence, the following research questions were addressed to improve and develop professional practice:

- What are PSST’s perceptions of their strengths in terms of the professional performance standards and their roles set for ADEC teachers?
- What are the areas that PSSTs need to develop for better practice; in line with anticipated roles and responsibilities of teachers and as contextualized by ADEC’s Professional Performance Standard?

### **Theoretical framework**

Walsh (2013) indicates that in time of educational changes and school reforms, the view of teacher’s role and responsibilities varies from practicing and fulfilling the classroom routines, delivering the lesson and using the appropriate resources, applying pedagogies and demonstrating communication skills to acting as a transformational catalyst to implement education changes. The section below elaborates on the conceptual framework of the study.

#### ***Are we training or preparing teachers?***

Teacher education has long struggled both to professionalize and to fully integrate itself into mainstream academia and pedagogy. At the core of this struggle was a perception that there was no body of specialized knowledge exclusive to the professional attributes that come within the scope of teachers’ preparation and training. According to Walsh (2013), the aim of teachers’ education institutions is to train and prepare the next generation of teachers.

According to DeAngelis, Warner and Che (2002) pre-service teachers’ preparation endorses induction, mentoring and support received by veteran teachers. This includes interactions, of pre-service teachers with the school stakeholders. DeAngelis et al. (2002) concur that research indicated that pre-service teachers’ preparation was significantly correlated with their sense of teaching efficacy, their sense of responsibility for student learning and demonstrating the professional attributes of teaching.

Though the two terms-train and prepare-appear to be interchangeable, they are not. Training a teacher is viewed as an oversimplification of teaching and learning, ignoring its dynamic and social aspects of the profession. Teacher preparation signals a significant shift in the profession in terms of going beyond the classroom and the teaching-learning attributes. The term teachers’ preparation embodies professional formation; where the function of teacher education is to launch the candidate on a lifelong path of learning, distinct from sole knowledge and pedagogy application. The chasm between the two visions of teacher education-training versus preparation

and formation have lead teachers’ education institutions to build the “capacity” of candidates that goes beyond the classroom, school community and the community to a larger extent (Walsh 2013).

### ***Teachers’ professionalism***

According to Travers and Rebores (2000), teachers’ professionalism is portrayed through three different characteristics: Altruism, competence and autonomy. Teacher’s professionalism is also featured by being; a communicator, a leader, a manager, a team player, a learner and a reflective practitioner (Blaik Hourani 2012). Teachers are viewed as communicators and he indicated that teachers who are good communicators with their students and parents resulted in greater positive student behaviour and achievement (Blaik Hourani 2012; Blaik Hourani, Stringer, and Baker 2012; Epstein 2001).

Teachers as leaders have been highlighted by the Institute for Educational Leadership (IEL 2001). IEL states that classroom teachers should be managers and take part in decision-making and their role actually helps enhance school reform and provide instructional leadership. Teacher leadership implies participating in a professional community to improve students’ performance, taking part in creating a positive school environment and becoming accountable for students’ academic standards and what goes on in a classroom as far as instruction, curriculum, implementing school policies and procedures, monitoring students’ behaviour, classroom management and providing feedback for parents (Good and Brophy 2008; IEL 2001).

Lieberman and Miller (2008) conclude that teachers act as collegial collaborators. Teachers learn and find support with professionals within and outside of the teaching profession. For example, involvement in: social support, professional and academic communities, research, parents association and charitable organizations. This support can be through sharing knowledge and experience, skills, resources and the formation of professional partnerships and networks

Research on effective teaching over the past two decades has shown that effective practice is linked to inquiry, critical thinking and reflection. Reflective practice is a beneficial form of professional development. Reflective teaching means exploring the implications of all complex factors embedded in teaching with the intention of understanding and improving practice (Blaik Hourani 2012).

In order to improve pre-service and novice teachers’ practice, educators need to provide the means of reflective-cognitive tools and self-assessment opportunities. This happens through the introduction of four modes of thinking: Technological thinking, situational thinking, deliberate thinking, and dialectical thinking. Coach-thinking and peer involvement are significant elements for reflective practice that takes place explicitly and implicitly (Kahn and Walsh 2006).

### ***Novice teachers teaming up for support and mentoring***

MacDonald (2009) states that PSSTs teachers need to work with school mentors. Working with a school mentor is significant; yet indicates several requirements. This is featured by: first, the willingness to work with others (school stakeholders) and to recognize that multi-layered tasks embedded in teaching can’t be performed solely. Second, asking questions. PSSTs need to write down questions as they occur to them and as situations are encountered or anticipated. Third, teachers need to be good listeners to the wisdom gained by veteran and experienced teachers. Fourth, is to plan with other members of your grade level team. Ultimately, acting and learning through a team benefits the students, as well as adds value to novice teachers’ experience and self-improvement.

Good teachers are continuous and long life learners. Throughout their careers teachers pass through developmental stages and they keep learning implicitly and explicitly; as they go (Katz 2004; Fullan, Hargreaves, and Pruden 2012). According to Fullan et al. (2012), the developmental stages are featured by three phases: First is novice phase, where teachers lack school centre experience, they are anxious and nervous in their pre-occupation and they are subject to control through the school system and this raises the level of their concerns as far as what they are teaching and how are they teaching. At this phase novice teachers appreciate mentoring and guidance.

Second, is the teaching phase. Teachers at this phase have the ability to cope adequately with the physical demands of teaching, however they are concerned with mastering the techniques of teaching; hence little thought is given to the wider purposes of teaching and education such as communicating and collaborating with the school stakeholders. Third, is the extended phase of professionalism. At this phase, the focus moves to the concern for individual learners and the learning process. The teacher starts thinking about the purposes of teaching and why techniques work. Moreover at this stage, the teacher is willing to experiment with new ideas and share insights with others; thus teachers become reflective and self-critical practitioners.

### ***Novice teachers and teacher educator modelling***

Loughran and Berry (2005) demonstrate two types of modelling. Implicit and explicit modelling is used by teachers' educators to prepare novice teachers. Implicit modelling implies using congruent teaching and explicit modelling of critical reflection on practice. Through implicit modelling, the teacher educator deliberately uses teaching and learning strategies and demonstrates professional attributes, attitudes and values that reflect good professional practice and performance standards (Sun, Slusarz, and Terry 2005). According to Sun et al. (2005), most educational settings focus on teaching conceptual explicit knowledge rather than setting up an opportunity for gaining substantial experiential and mostly implicit knowledge. While this may be appropriate for some subject areas, other subject areas and professional skills may require learning information. In addition, the bottom-up direction that implies learning first implicit knowledge and then explicit knowledge or learning both in parallel has been largely ignored though the role of implicit learning in skill acquisition has been widely recognized in recent years (Sun et al. 2005).

### ***ADEC and the transformative role of teachers***

By means of school reforms taking place in Abu Dhabi and within the context of educational change, the teachers' roles in cycle 1, imply communication-enhancing literacy skills and thinking aloud and this is characterized by (1) finding out what skills and understandings the child knows and what they need to learn next and (2) assessing the reading level of the child through using manipulative and teaching-learning instruments in order to ensure a concrete understanding of abstract concepts (ADEC 2012). Embedded within the transformative role of cycle 1 teachers and as indicated by ADEC, teachers need to function professionally within the (1) social approach, (2) emotional approach, (3) attitudinal approach, (4) creative and resourceful approach and (5) technological approach. These approaches indicated in “ADEC Performance Standards for Teachers” shape the role of the teacher and necessitate the need for teachers to be communicators, interactive and collaborative community members, managers, leaders, team players, and reflective practitioners (ADEC 2012).

One of the fundamental changes that occurred within the NSM framework of reforms is the introduction of English as a medium of instruction to teach Maths and Science. Nonetheless, Emirati teachers and in particular ECAE-PSSTs are bilingual teachers and Arabic is their mother tongue. According to Moussu and Liurda (2008), it has become common in the last few years to point out the ever-growing number of non-native speakers and learners of English in the world and as a result of these escalating demands in English instruction, the majority of trained ESL/EFL teachers in the world are non-native English speaking teachers. Canagarajah (2005) adds that 80% of the English teachers in the world are non-native speakers. Moussu and Liurda (2008) add that these teachers if trained efficiently are used to provide English instruction exclusively in EFL contexts.

### ***Teacher's performance standards, as set by ADEC***

ADEC teachers are evaluated against five “Professional Performance Standards”. Teachers' evaluators are required to cite evidence to justify their judgment(s). Each teacher will receive a final rating that indicates performance according to the following five-level performance scale (ADEC 2012a): (1) Accomplished: the teacher is consistently meeting most performance standards

to a very high level; (2) Established: the teacher is consistently meeting most performance standards satisfactorily; (3) Emerging: the teacher is consistently meeting some, but not all, performance standards satisfactorily; (4) Foundation: the teacher is partially meeting some of the performance standards and (5) Pre-Foundation: the teacher is not meeting the performance standards, or is meeting them at only a basic level. In order to move forward on the scale (for example from foundation, to emerging, emerging to established, etc.) the teacher must perform fully at the previous level. The final rating will be automatically generated from an online scoring of the teacher evaluation form.

According to ADEC, there are four different standards that teachers are to be evaluated at. PSSTs’ knowledge about these professional standards is necessary for their success and longevity in the profession. This necessitates self-reflecting, professionally speaking, on these standards in order to recognize and self- assess their professional strengths and allocate areas needing development. Performance standards are stated in “ADEC Teacher Evaluation Process, Explanation and Instrument, 2013-2014” document. The performance standards and their indicators are illustrated in Table 1 (ADEC 2013).

Table 1. Indicators of ADEC teachers’ performance standards

Performance Standard- 1: Professionalism	Performance Standard-2: Curriculum	Performance Standard-4: Classroom	Performance Standard-5: Community
1-Committed to ADEC and School vision and mission. 2-Undertakes professional Development. 3-Undertakes assigned responsibilities. 4-Demonstrates knowledge of content and pedagogy. 5- Contributes to the professional learning community.	1-Committed to implementing the Curriculum. 2-Modifies instruction based on student achievement. 3-Plans differentiated learning experiences. 4-Plans effective learning experiences according to learning styles. 5- Plans learning experiences for creativity and critical thinking.	1-Ensures students are engaged in learning. 2-Treats students with respect. 3-Creates a safe learning environment. 4-Provides constructive feedback to students and parents. 5- Creates an environment that makes prudent use of resources.	1-Provides constructive feedback to parents. 2-Provides information to parents about instructional curriculum. 3-Participates in wider school community.

### **Research methodology**

This research project was conducted by an education studies faculty member employed at a Higher Education Institution in Abu Dhabi. The researcher is bilingual English Arabic speaker. The methodology adopted in this research is an exploratory qualitative case study. According to Merriam, the case study research focus on: “discovery, insight, and understanding from the perspectives of those being studied; offering the greatest promise of making significant contributions to the knowledge base and practice of education” (2009, 3).

### ***Research participants and sample selection***

The participants in this case study are pre-service-student-teachers in a teachers’ college in Abu Dhabi, United Arab Emirates. Twenty percent random samples of B.Ed-4, who are currently studying at ECAE, were engaged in this research. Participants (PSTTs) were engaged in their 10 weeks internship. This 10 weeks internship is significant for this research because this is the PPSTs’ first engagement in teaching at public schools. During the 10 weeks internship, PSSTs will teach a full load and they are expected to fulfil the teachers’ professional roles and responsibilities.

### ***Research design***

The research project employed mixed qualitative and quantitative approaches to collect data.

The researcher designed the research tool in alignment with ADEC’s performance standards for teachers and ADEC’s appraisal tool for teachers. The quantitative research tool used consists of 39 closed ended questions. As for the qualitative component of this research, five open ended questions were addressed in a semi-structured setup. The open ended questions addressed: (1) PSSTs’ professional traits/ attributes, (2) PSSTs’ knowledge about professional standards and anticipated roles and responsibilities, (3) PSSTs’ professional reflections on pre-service practice and (4) PSSTs anticipated professional challenges. To ensure validity and reliability of the research tools, the pilot study was conducted with B.Ed-4 students (PSSTs) at ECAE. The pilot study helped simplify and clarify open ended and closed ended questions that were used as research tools to conduct this study.

### ***Data management and analysis***

Data collected from the questionnaire and semi-structured interview responses was grouped and itemized per ideas relevant to the professional standards that the research tools embody. Hence, coding and decoding was implemented through the analysis of participants’ responses using points relevant to the professional standards embodied in the research tools. Triangulation of data took place in light of the data collected, the literature review traced within the context of the professional performance standards set for teachers by ADEC. Triangulation had proved to be an effective method for analysing and reporting on qualitative and quantitative data (Merriam 2009).

### **Findings**

Through the PSSTs’ responses, findings highlighted the following themes: (1) perceptions of professional attributes and performance standards in context of ADEC expectations, (2) areas of strengths, and (4) areas needing improvement. Findings were consolidated by means of qualitative and quantitative data collected and analysed. The qualitative and quantitative research tools included open ended and closed ended questions.

### ***PSSTs perceptions: professional attributes and performance standards***

PSSTs responses relevant to professional attributes encompassed: communication, teaching-learning, professional development, roles and responsibilities and classroom environment. PSSTs viewed themselves as open to new ideas, capable of dealing with challenging behaviour, being able to work under pressure and receptive to guidance. They voiced their readiness to work with colleagues to overcome professional challenges in order to develop professionally. PSSTs affirmed that they are tolerant, when it comes to repeating the lesson and going over their teachings, in order to accommodate differentiated teaching-learning (PSST-12, PSST-15, PSST-9, PSST-2 and PSST-11). Nevertheless, as far as professional teaching attributes were concerned, the PSSTs claimed not being knowledgeable about keeping abreast with new research in the teaching profession, lacking the ability to establish positive climate in the school, overlooking the significance of professional development and being unable to conduct self-reflection on their practice. The findings below categorize the PSSTs perceptions of their roles per performance standard and their understanding of their expected roles and responsibilities; as conceptualized within the current education changes and school reforms.

#### ***Communication performance standard***

In terms of communications, PSSTs stressed the significance of communicating with parents, and they have indicated that being a bilingual Emirati teacher is an asset as far as communicative language. However, PSSTs were concerned about the social context of teaching-learning. PSSTs noted that they rated themselves as friendly and sociable and perceive themselves as good listeners (PSST-14; PSST-11; PSST-4; PSST-6; PSST-8; PSST-10; PSST-7; PSST-10). This dimension was explained by PSST-4: “I am sociable and able to communicate with parents, students and teachers. Communicating with parents and students helps me achieve my goals as a teacher”. In the

communication domain, and within the same realm, PSST-7 stated: “I am an Emirati teacher and the students like that because I understand their culture. I can talk in English and Arabic, so I can help the students and explain for them in Arabic if needed.” Despite the above, most of the PSSTs expressed the difficulties they are encountering in relevance to the communication performance standard.

Communication as a performance standard is a double edged sword. On one hand, PSSTs were able to communicate with the Arabic speaking school stakeholders. On the other hand, few professional constraints and limitations have emerged within the teaching-learning and classroom standards due to the PSSTs lack of English language proficiency. In this case, Emirati PSSTs have viewed this as a shortcoming and area needing improvement. This was characterized by the language barrier encountered in delivering the lesson in English as a required medium of instruction for Maths and Science. To elaborate, PSST-1 stated: “I use Arabic as a medium of instruction where I am expected to use English instead and I am more comfortable using Arabic as a medium of instruction.”

Regardless of language barrier, PSSTs have noted communication problems with parents, PSST-15 referred: “I think I face difficulties of communicating with parents as far as providing a feedback about the child’s progress.” In addition to this and aside from the language factor as a barrier, PSST-12 explained: “I find dealing with parents very difficult because I don’t know what are they (parents) expecting from me. Moreover, how to deal with parents was not part of my preparation and course training.”

Moreover, PSSTs have conveyed their discomfort regarding dealing with the school community and stakeholders. PSST-1 exclaimed: “I was never exposed to dealing with the community before.” PSST-3 added: “Communication with the school community is difficult. I need to focus on improving myself in this area. So far, my effort was on improving my classroom performance and not concentrating on communicating with parents.” PSST-11 referred: “I think I will face problems in communicating with parents because some parents don’t follow-up their children’s academic progress and disciplinary problems. I am not sure how to explain their (parents) parenting roles and responsibilities.” Overall, PSSTs considered communicating with both parents and the school community to be a challenge. In relevance to this, PSST-6 stated: “I am expected to communicate ADEC learning outcomes to parents; that is a challenge at times. Communicating with parents is highly required as a teachers’ professional skill. This continues to be difficult.”

#### *Teaching-learning performance standard*

Within this performance standard, PSSTs conveyed their implementation of differentiated teaching-learning strategies (PSST-1; PSST-2; PSST-5). To elaborate on this, PSST-10 expressed: “I am helpful and creative and I use various methods of teaching to match the students’ learning styles.” PSST-2 added: “I like to engage students in learning. I design the lesson for different learning styles. I make Maths lesson in four different learning styles; such as using wooden cubes, learning through role playing and simulation games.”

In terms of engaging students, student-teachers indicated their capability to attract students’ attention and involve students in teaching-learning. For example, PSST-5 stated: “I have creative ideas. I try to connect my activities to the real world and Emirati culture.” Being Emiratis and bilingual have positioned the student-teachers within the socio-cultural context of learning. PSSTs considered this as part of their strengths that is embedded in the ADEC performance standards (the public school system in Abu Dhabi embodies EMTs- English native speakers who teach Maths, Science and English and the majority of these EMTs are non-Arabic speakers). To elaborate on this, PSST-8 stated: “I am a bilingual teacher. This makes my students feel comfortable in the class. Because there is no language barrier, it is easier for my students to understand science and Maths concepts; since I can re-explain in Arabic.” Simultaneously, PSSTs expressed areas of weakness in terms of their inability to: (1) give constructive feedback for the student, (2) stimulate discussion in the classroom and (3) encourage and create opportunities for students to become independent learners. Another challenge situated within ADEC’s teaching-learning performance

standards is assessment strategies and constructing assessment tools. PSST-10 indicated: “Although I have learnt about the types of assessments, I still find it difficult to design an assessment.” Conclusively, areas needing improvement as far as the performance standard of teaching-learning were characterized by creating learning experiences for students, interdisciplinary learning and reflections on how and what are the children learning.

#### *Community performance standard*

The community performance standard portrayed the PSSTs’ weakness. These were mainly in the area of establishing respectful and productive relationships with parents/guardians and contributing to the community professional learning. Concerns about team planning revealed challenges embedded in various performance standards including; curriculum, teaching- learning and communication. PSSTs have noted that team planning may be frustrating and explained their point of views. PSST-9 expressed: “I encounter difficulties in working within a team. I hate to have an idea; then it is rejected by others. I don’t feel comfortable about a leader controlling me and giving me orders.” Within the same domain, PSST-14 stated: “I am not comfortable with team planning because some teachers have different ideas from mine and it is hard for me to accept that.” Weaknesses drawn from communication and community performance standards (both performance standards overlap to an extent in terms of the tasks and duties embedded) lead to problems and obstacles within the classroom, curriculum and teaching-learning performance standards.

#### *Classroom performance standard*

With relevance to classroom performance standard, most of the PSSTs reported facing difficulties over discipline in the classroom. In this realm PSSTs said that the following areas were regarded as areas needing improvement. These improvements need to be taken into consideration during their professional preparation and training; (1) how to encourage their students to become independent, critical, and creative thinkers and (2) how to employ the principles of effective classroom management. PSSTs reflected on this dimension in terms of challenges faced and anticipated difficulties. PSST-4 stated: “Classroom management and dealing with student’s behaviour is difficult. It is hard to absorb and manage children’s behaviour. I need time to look into each student’s behavioural problem and how to discipline him/ her.” PSST-5 added: “Difficulties I may face in my teaching profession are related to classroom management; especially if have an inclusion class with special needs students I am not knowledgeable about behavioural modification techniques for special needs students.”

Concerns in dealing with behavioural problems erupting in the classroom were expressed by PSST-2: “I am not prepared to deal with hyperactive students who are disruptive. This may impact on my classroom environment and I may fail to manage my class.” PSSTs described the difficulty in terms of the gap between the theory and practice regarding the implementation of classroom management strategies and techniques. PSST-3 explained: “I still need to improve in classroom management application, so I can finish my lesson learning outcomes. I think that there is a gap between theory and reality; I haven’t been able to cope with it yet.” PSST-8 added: “I am still dissatisfied with my classroom management techniques. Students demonstrate different behaviours and I need to work hard on tackling behavioural problems and finding solutions to modify their behaviour”. As indicated by PSSTs classroom management issues stemmed out of the tailoring for differentiated learning and instruction which is hard (PSST 3, PSST-8 and PSST-12). Generally speaking, PSSTs are aware of the challenges underpinning classroom management that impact negatively achieving desired learning outcomes.

#### *Curriculum performance standard*

Delivering the curriculum was also a challenging area for novice teachers. PSST-6 stated: “My major weakness is assessment, planning and creating resources. I need constant assistance and guidance.” Issues relevant to difficulties faced in subject knowledge were also categorized as



challenges: “I have weaknesses in the subject areas I am delivering” (PSST-7). Another PSST added: “I am weak in technical language” (PSST-14). Since cycle 1 teachers are expected to integrate the teaching-learning of Maths, Science and English, few teachers have stated their shortcomings as far as the implementation of integrated teaching-learning: “I have difficulties in integrating three subjects (PSST-15). Moreover, PSSTs have encountered difficulties in assessing learning; hence PSST-10 referred: “Assessing students is frustrating; because students tend to fail assessments though teachers spend a lot of time teaching and explaining.” As for teaching-learning resources, pitfalls in this area were reflected, where PSSTs expressed difficulties faced in constructing teaching-learning resources that match learning outcomes. PSST-15 stated: “My weaknesses is revealed in failing to create resources that match the curriculum and learning outcomes.” Difficulties relevant to implementing teaching-learning strategies within the context of Abu Dhabi learners were drawn. Within this perspective, PSST-1 indicated: “I want to go back and apply different student-centred strategies I have learnt at the college. Nevertheless, implementing these strategies is beyond the level of my students.” PSSTs noted that planning was problematic, and completing the lesson plan successfully and on time was a challenge. PSST-11 explained: “Planning is beyond me because sometimes I write planning for one week then I am unable to finish my unit or my lesson plan on time; hence students aren’t assessed.” PSST-11 said: “I am confused with my lesson planning; especially linking and integrating between/ among subjects.” PSSTs have faced difficulties at; (1) creating interdisciplinary learning experiences that integrate knowledge from several disciplines, (2) engaging and reflecting on how and what are children learning in Maths, science and English and (3) adjusting instructional strategies in response to students’ feedback and learning progress.

### **Conclusions and implications for teacher education**

Findings revealed that PSSTs are going through professional preparations in terms of general planning, acquiring curricular and pedagogical cognitive knowledge and skills. Within the professional teaching attributes, PSSTs noted areas needing improvement in their preparation. Concerns and challenges were featured by the shortcomings in the following areas: Community involvement, communication, team playing, reflective practice, management and assessment. These shortcomings impacted pedagogical, curricular and behavioural dimensions of teaching-learning; such as: integrated lesson and unit planning, team planning and disciplining the classroom generally speaking and more specifically classrooms with special needs students and differentiated learners. The curricular difficulties PSSTs faced were related to assessment, integrated planning and synchronizing learning outcomes with resources. These difficulties could be rooted in the absence of support mentor-mentee system (De Angelis et al. 2002; Walsh 2013).

It was also evident that PSSTs had language drawbacks. A language support program is also recommended to improve Emirati PSSTs language skills specifically that PSSTs at ECAE are Arabic native speakers and are teaching in English as a medium of instruction. This is in line with Canagarajah (2005) who stated that with efficient preparation non-native speaking teachers can become proficient in teaching English as a second language and deliver in English as a medium of instruction. Teachers’ preparation goes beyond subject knowledge; it endorses exploring learning opportunities and professional attributes and skills. Within this perspective, teachers’ education ought to focus on teachers’ preparation rather than the mechanical training of teachers (De Angelis et al. 2002; Blaik Hourani 2012; Walsh 2013). This includes developing communicating skills, team building skills, leadership and management skills. In addition to this teachers need to be equipped with managerial skills for improved classroom management and in order to reduce the potential of academic disturbances and to increase students’ involvement in learning. Developing such skills will enhance positive relationships with the school stakeholders and promote professional attributes that teachers need to be enriched with. Reflective practice is significant for professional development and career improvement. Novice teachers need to be endowed with cognitive tools and reflective opportunities to recognize their drawbacks, assess themselves and find means to improve their practice. Lifelong professional skills that go beyond curricular delivery

need to be enhanced through the professional preparation. Demonstrating the above mentioned long life professional skills and attributes are inseparable from subject area and pedagogy preparation (Walsh 2013; Good et al. 2008).

Since Abu Dhabi is taking on the professional preparation of future Emirati teacher, an effective teachers’ support system for novice teachers is vital. Teachers’ support system needs to be in harmony with the New School Model conceptual framework; where integrated teaching-learning, English as medium of instruction and student-centred learning are at the core of the school reforms and education changes. The support system needs to inculcate professional skills within teacher education programs without eliciting a dependency on the support system. The support system for novice teachers needs to feature professional guidance, and professional development (Fullan et al. 2012).

Learning to teach shouldn’t be a linear process but a practical endeavour that encompasses a holistic understanding and implementation of performance standards. The construct of teachers’ education include: communication skills, community involvement, reflective skills, leadership skills and management skills. These constructs shape the teachers’ identity where novice teachers demonstrate their roles and responsibilities more confidently and paves the way for a more productive explicit understanding and performance of their profession (Katz 2004).

Teachers’ education needs to demonstrate both implicit and explicit modelling within the teachers’ education program (Sun et al. 2005). The challenges addressed in this paper require the redesigning and restructuring of teachers’ education goals and aims in order to improve the quality of teachers’ preparation and elevate the level of professionalism among novice teachers.

## Endnotes

A long-term plan for the transformation of the Emirate’s economy, including a reduced reliance on the oil sector as a source of economic activity over time and a greater focus on knowledge-based industries in the future.

## References

- Abu Dhabi Education Council. 2008. *Together*. Abu Dhabi: ADEC Publication.
- Abu Dhabi Education Council. 2010. *New school model*. Abu Dhabi: ADEC Publication.
- Abu Dhabi Education Council. 2012. *Abu Dhabi education reform: the road to 2030*. Abu Dhabi: ADEC Publication.
- Abu Dhabi Education Council. 2012a. *ADEC teacher evaluation process*. Abu Dhabi: ADEC Publication.
- Abu Dhabi Education Council. 2013. *ADEC’s teacher evaluation process, explanation and instrument*. Abu Dhabi: ADEC Publication.
- Blaik Hourani, R. 2012. “Pre-service teachers’ reflection: perception, preparedness and challenges.” *Reflective Practice* 14 (1): 12-30. doi:10.1080/14623943.2012.732947.
- Blaik Hourani, R., P. Stringer, and F. Baker. 2012. “Constraints and subsequent limitations to parental involvement in primary schools in Abu Dhabi: Stakeholders’ perspective”. *School Community Journal* 22 (2): 131-160. <http://www.schoolcommunitynetwork.org/SCJ.aspx>.
- Canagarajah, A. 2005. *Reclaiming the local in language policy and practice*. Mahwah, NJ: Lawrence Erlbaum.
- DeAngelis, K., A. Warner, and J., Che. 2002. “The impact of preservice preparation and early career support on novice teachers’ career intentions and decisions”. *Journal of Teacher Education* 66: 170-183.
- Epstein, J. 2001. *School, family, and community partnerships: preparing educators and improving schools*. Colorado: Boulder, CO: Westview.
- Fullan, M., A. Hargreaves, and J. Pruden. 2012. *Professional capital: transforming teaching in every school*. Canada: Teachers’ College Press and Ontario Principals Council.

- Good, T., and E. Brophy. 2008. *Looking in classrooms*. Boston: Pearson.
- Institute for Educational Leadership .2001. “Leadership for student learning: redefining the teacher as leader”. Institute of Educational Leadership. <http://iel.org/programs/21st/reports/teachlearn.pdf>.
- Kahn, P., and L. Walsh, 2006. *Developing your teaching: ideas, insights and actions*. London: Routledge.
- Katz, L. 2004. “The developmental stages of pre-school teachers”. <http://www.jstor.org/discover/10.2307/1000851?uid=3737432&uid=2&uid=4&sid=21104137794391>.
- Lieberman, A., and L. Miller. 2008. *Teachers in professional communities*. New York: Teachers’ College Press.
- Loughran, J., and A. Berry. 2005. “Modelling by teacher educators.” *Teaching and Teacher Education* 2: 193-203.
- MacDonald, E. 2009. “Collaborating with colleagues: being a team player”. <http://inspiringteachers.ae/2009/10/collaborating-with-colleagues-being.html>.
- Merriam, S. 2009. *Qualitative research: a guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Moussu, L., and E. Liurda. 2008. “Non-native English-speaking English language teachers: history and research.” *Language Teachers* 41 (3): 315-348. doi: 10.1017/S0261444808005028.
- Sun, R., P. Slusarz, and C. Terry. 2005. “The interaction of the explicit and the implicit in skill learning: a dual-process approach.” *Psychological Review* 112 (1): 159-192. doi: 10.1037/0033-295x.112.1.159.
- Travers, P., and R. Rebores. 2000. *Foundations of education: becoming a teacher*. Boston: Allyn and Bacon.
- Walsh, K. 2013. “21st-century teacher education: ed schools don’t give teachers the tools they need.” *Education Next* 13 (3): 3-4. <http://educationnext.org/21st-century-teacher-education>.

[Back to contents](#)



## Global perspectives in teacher education: a study of international practicum

*Gerd Wikan & Jørgen Klein*

*Hedmark University College, Norway*

gerd.wikan@hihm.no & jørgen.klein@hihm.no

### Abstract

Norwegian classrooms have become more multicultural and this implies new challenges for teachers and teacher education. International practicum is often presented as more efficient in developing intercultural competence and global perspectives than theoretical lectures. Our focus in this study is to investigate how the students' transform their perspectives through an international practicum in Namibia. The main findings are that students increased their professional self-efficacy and became more empathetic and began questioning stereotypes of others. Their experience in Namibia raised their appreciation of cultural diversity and many of them believe that it will make them better teachers in a multicultural classroom. Some also express that they are better qualified to communicate with people from other cultures than before they left for Namibia. However, an increased emphasis on internal causes of poverty and a more critical attitude to some Namibian educational practices after the practicum than before might be interpreted within an ethno-centric framework.

**Keywords:** international practicum; Namibia; teacher students; global awareness; intercultural competence.

### Context of the research

Norwegian classrooms have become more diverse due to immigration from both European and non-European countries. This implies new challenges for teachers and teacher education. However, many teachers and teacher students are majority culture Norwegians with limited experience or knowledge of other cultures. They are therefore unprepared to work with pupils with diverse backgrounds. According to Walters, Garii, and Walters (2009), the disparity between teachers' culture and experience, and those of their pupils creates classrooms where teachers are unable to adequately address the needs of pupils with diverse backgrounds.

Norwegian teacher education is criticized for being too inward looking, focusing on the traditional Norwegian society and not responding to the challenge of ethnic and cultural diversity. In White Paper no. 11 (2008-2009) the Government responds to this challenge by focusing on increased internationalization in teacher education. Norwegian teacher education institutions followed up by including global and multicultural dimensions in all subjects. In addition, some institutions also offer an international term during the four - year teacher education program. Most commonly this is an international study-abroad program. However, few students take part in international exchange programs and most students are exposed to global and multicultural issues only at a theoretical level.

Hedmark University College offers international practicum in Namibia for pre-service teacher and pre-service kindergarten students. The students participate in international practicum in Namibia in combination with writing their BA-thesis. This includes a 12-week stay in Namibia in which, the students work as teachers in Namibian primary and lower secondary schools, as well as in kindergartens. In parallel with the practicum they do a small fieldwork for their BA-thesis. The goals for the international practicum are to increase the students understanding of cultural differences, get new perspectives on education and schooling, and experience living in another country in order to enhance global perspectives.

## Research question

Our focus in this study is to investigate if these goals are met through the international practicum, with a special emphasis on the development of the students’ global perspectives and self-development. Although most studies seem to find a positive correlation between international practicum, intercultural competence and global awareness, we also wish to question if this is always the case. Could some students actually come back with a more narrowed mind for cultural differences, and reinforced stereotypes about global issues? That is, can practicum abroad give a colonial interpretive framework to the students? Thus, we wish to construct a study that intends to cover all aspects of the practicum experience and that is sensitive to possible negative outcomes that might be a part of such an experience. This information will again be very useful in the design of such programs. Based on these considerations the main research questions of the study are: How is Norwegian teacher students’ global perspectives and self-development affected through a nine-week international practicum in Namibia?

## Theoretical framework

Theoretical courses in diversity, multiculturalism and cross-cultural understanding are important, but it is questionable how capable these types of courses are of changing the values and perspectives of the students. It is also questionable how well such courses prepare students for work in the diverse classroom. Merryfield (2000, 2008) questions the ability and commitment of middle-aged white teacher educators from the majority culture to teach for equity and diversity. According to Walters et al. (2009) an international practicum is more effective in developing cultural competence and global awareness than theoretical lectures. Other studies emphasise that a teaching abroad experience is recommended as preparation for work in a diverse classroom (Cushner 2007; Cushner and Mahon 2002; Quezada 2004).

A summary of studies that focus on benefits of exchange programs for teachers done by Leutwyler and Meierhans (2013) suggest that the participants increase their professional self-efficacy (Pence and Macgillivray 2008); becomes more empathetic and began questioning stereotypes of others (Cushner and Mahon 2002); raise their appreciation of cultural diversity in schools (Kambutu and Nganga 2008); develop communication skills with children from cultural minorities (Chieffo and Griffiths 2004; Wiggins, Follo, and Ebery 2007); deepen their reflection on specific cultural imprints of schooling and teaching and give them increased global awareness (Keese and O’Brian 2011) and strengthen their global orientation in teaching (Willard-Holt 2001; Pence and Macgillivray 2008).

Although there is a consensus that participation in international practicum programs leads to increased global and cultural sensitivity, there is no consensus on which concepts are most useful to describe such experiences and the learning and competence obtained through the programs (Cushner and Mahon 2009). Sinicrope, Norris and Watanabe (2007), listed up 19 terms that are alternatively used to discuss what we broadly can label intercultural competence. These range “transcultural communication”, via “intercultural interaction” to “ethno relativity”. Hammer, Bennett and Wiseman (2003) distinguish between “intercultural sensitivity” and “intercultural competence”, whereas the first relates to the ability to discriminate and experience relevant cultural differences, and the latter refers the ability to think and act in intercultural appropriate ways. Deardorff (2004) highlights that most of the definitions of intercultural competence include more than knowledge of other cultures, since knowledge alone are not enough to constitute intercultural competence. Intercultural competence also involves the development of one’s skills and attitudes in successfully interacting with persons of diverse backgrounds. Cushner’s (2007, 27) definition seems inspired by Mezirow (1981) when defining intercultural interaction as “the ability to communicate and collaborate with people whose attitude, values, skills and knowledge are significantly different from their own”.

Many concepts are also used to describe the global learning gained by taking part in international practicum. Cushner and Mahon (2002) use the concept “worldmindness” to describe a reduction in ethnocentrism and greater sophistications in one’s thinking about others. Quezada

(2004) finds the term “global thinking” useful to describe the finding that international experience makes students question their own culture. The concept “global-minded” is used by Walters et al. (2009) to describe how the students become more involved in international activities, have more friends in other countries and are more interested in global issues. Keese and O’Brian (2011) and Merryfield (2008) use the term “global awareness” and define this to include knowledge, interest and engagement in global issues, local/global connections, and diverse cultures.

Theoretically, this research is motivated by Bennett’s developmental model of intercultural sensitivity. The theory concentrates on the individual’s growth that leads to a better understanding and sensitivity to differences (Bennett 2004). Bennett’s model constitutes a development of orientations toward cultural difference from ethnocentric to ethno relative stages. Three ethnocentric orientations, where one’s culture is experienced as central to reality (Denial, Defense, Minimization), and three ethno relative orientations, where one’s culture is experienced in the context of other cultures (Acceptance, Adaptation, Integration), are identified. The stage of adaptation is of special relevance as it is the goal of intercultural training programs. People in this stage can according to Bennett (2004, 70): “engage in empathy- the ability to take perspective or shift frame of reference vis-a-vis other cultures”. A shortcoming of Bennett’ model is that it does not explain how the transformation takes place, as for instance Mezirow (1981) does.

Mezirow (1981), in his transformative learning theory, describes the process of transformative learning that must take place in order to become intercultural competent. Critical self-reflection on experiences and interpretations are key issues in the process that leads to perspective transformation. Perspective transformation leads to change in the frame of reference including change in habits of mind and points of view (Mezirow 1997). The new frame of reference should be considered more functional when it is more inclusive and open to other points of view and integrative of experience (Mezirow 1998). Experiences of other cultures are important to start a process of perspective transformation and Taylor (1994) emphasizes the important role of experiencing culture shock as a catalyst for perspective transformation that may lead to intercultural sensitivity. Furthermore, the experience of otherness is an important aspect of becoming more intercultural sensitive (Abdallah-Preteuille 2006). This is the reason international practicum programs are potentially transformative in nature. First-hand knowledge and culture shock is seen as critical in developing intercultural competence (Cushner 2007; Taylor 1994). Living and working in a different culture challenge the perception of oneself, of others and of the home culture and country. This is a prerequisite in the transformative learning theory (Walters et al. 2009) and students may develop “perspective consciousness” that help them to understand other cultures and conflicting viewpoints by living abroad (Stachowski and Sparks 2007).

Wilson (1993) summarizes the benefits of teaching abroad in a simple model and uses the concepts “developing self and relationship” and “gaining a global perspective” to analyse the gains of taking part in international practicum (see Figure 1). According to Wilson (1993, 21) there is evident that international experience influences both substantive knowledge and perceptual understanding aspects of a global perspective, in addition to personal growth. Personal growth in this context relates to acceptance of self and others and general maturity. It may also include dimensions such as increased self-confidence and independence. Interpersonal connections include ability to intercultural interaction. This includes, but is not limited to, friendships with persons in the host country. It may also include the ability to act as a cultural mediator. The global perspective dimension includes substantive knowledge, which is related to facts and understanding of another country or culture in addition to general awareness of global issues. Perceptual knowledge includes open-mindedness, anticipation of complexity, resistance to stereotyping, and a more open attitude to others and less chauvinism (Wilson 1993). We find this model useful in relation to our project and will operationalize and structure our empirical findings and discussion according to this model.





Figure 1. A model for the impact of an international experience  
Source: Wilson 1993

## Research methodology

In order to gain insight into the research question we conducted a qualitative study. Within a qualitative methodology, focus is on meaning, values, intentions and emotions of the informants and the main goal is to obtain an understanding of their perspectives (Kitchin and Tate 2000). The choice of this methodology is mainly to do with the explorative nature of the research question and a focus on the perspectives of the informants. Drawing on the methodology of Willard-Holt (2001) developed for pre-service teachers in international programs we have developed two open-response questionnaires to be answered pre- and post-practicum. The pre-practicum questionnaire (Q1) and the post-practicum questionnaire (Q2) are very similar in order to compare directly for each student how the 3-month practicum has affected issues related to global perspectives and self-development. A system of numbering the pre- and post-questionnaires ensures that the answers from the same student can be compared before and after, as well as securing the anonymity of the students.

The questionnaire consists of a mix of fixed questions where the respondents mark on a scale their perceived level of for instance tolerance or knowledge, and open-ended questions where the respondents explain and elaborate with their own words. The sample consists of 16 students (Q1). Unfortunately, three students were not available during the second round of interviews so Q2 has 13 respondents. During the stay in Namibia a focus-group discussion raising the same themes as in the Q1 was conducted with the whole student group. Individual tutoring and informal conversations with the students while in field also contributed valuable knowledge to the study. In addition to this, we wanted to do in-depth interviews with 4-5 of the students after their return from Namibia in order to gain deeper insight into the transformative process the practicum has contributed to. Due to time constraints, this was not conducted this year, but will be done next year on a similar group of students. On a longer time-scale, we wish to do follow-up interviews with the students after they have graduated and have been working as teachers for a while in order to see if the practicum experiences have had any long-lasting effect on their frame of reference. We consider this first study as a pilot where we managed to test the instruments and design of the study, in addition to obtain some very interesting information. The study will be followed up next year with some amendments to the questionnaire, and timing of the different interventions.

## Findings

We structure this part of the paper in accordance with the theoretical model of Wilson (1993) as described previously. Thus, we separate “gaining a global perspective” from “developing self and relationships” although both are aspects of intercultural competence and global awareness. These two fractions might be overlapping but for the sake of organizing the empirical material we

will follow this structure. It must also be noted that the findings are based on how the students themselves evaluate their situation, and thus the information is subjective in nature.

### *Gaining a global perspective*

Gaining a global perspective includes substantive knowledge about countries, cultures and global processes, while perceptual knowledge relates more to attitudes to others such as in the level of chauvinism expressed.

In one of the questions, we ask how much knowledge the students have about other countries and cultures, and how they perceive themselves as qualified to be teaching such issues. In Q1 there is a considerable variation in the material, although a majority of the students rate themselves between sufficient and less than sufficient in relation to knowledge about other people and cultures. In Q2 the picture is the opposite and a vast majority report that they have sufficient or more than sufficient knowledge about these issues.

To follow up on this aspect two of the questions relate to how they think poverty is manifested in Africa and what the main causes of poverty might be. Here we see that the descriptions are far more general in Q1 than in Q2. Many point to the low standard of housing, unemployment, lack of education and lack of food as the most prominent features of poverty. In Q2 we see a more nuanced picture, but also much more detailed. An interesting feature is that many of the students, in addition to what they described in Q1, now also point towards the lack of security at different levels, corruption, alcoholism, an unequal society and violence as prominent features of poverty. As one student stated:

“Poverty is manifested through a lack of security and safety in different forms. Such as very poor housing, with a lack of clean water and electricity. Lack of a job or permanent job that gives a steady income. Lot of alcoholism and violence in the home.”.

When asked about what the main causes of poverty are we see that most students are vague. However, some students point to colonialism, uneven distribution of resources, lack of education and lack of employment as main causes in Q1. In Q2 we see that corruption, consequences of the former apartheid policy, an unequal society, lack of language skills (especially English), alcoholism and lack education and employment opportunities are the most mentioned reasons. The answers in Q2 tend to be much more nuanced and rich in detail than in Q1. For instance, one student in Q1 answered in one word: corruption. In Q2 the same student had a long and very rich description of the causes of poverty:

“This is a hard question. In Namibia I think it is due to there not being enough educated people in the country. It is very hard to get a good education in Namibia and it is even harder to have continuing education. This is not helpful for the country in its efforts to develop further and combat poverty. In Africa in general there are enormous differences from country to country. South-Africa is doing better due to tourism and other factors. In Zambia, Zimbabwe and Botswana there is also a lot of tourism. Unfortunately East -Africa is characterized by a lot of corruption and wars which is not tackling the poverty problem. There are not many stable countries in Africa.”.

This is very interesting as the student really addresses the vast variation that exists on the African continent, even though not all of the considerations are equally valid. It is also interesting to see that in Q1 there tends to be more emphasis on external causes of poverty, such as colonialism and global structural inequalities. In Q2 there is more focus on internal causes such as corruption, alcoholism and mismanagement of various kinds. This might be interpreted as a strengthening of colonial or neo-colonial perspectives and attitudes related to African misconduct and European superiority. However, at another level it is uncertain if the students by acknowledging and mentioning internal causes see them as more proxy outcomes of underlying external causes, or if they see them as the fundamental causes to poverty.

Many mention poor education, and especially lack of language skills, as an obstacle to development. This is a serious problem in Namibia and the strong focus on this aspect is probably due to the placements of the students in schools and kindergartens where this problem is highly accentuated. As one student wrote in Q2:

“There are many people and few jobs. There is a lack of education, because there is a lack of money for education. The 13 different languages might be a hindrance to getting a job. If you for instance speak Damara it is not easy to get a job in a shop. Even if English is the main language we observed adults who could not speak English.”.

Another highly relevant and interesting question in this respect is attitudes toward development aid. When asked if development aid should be increased, kept at today’s level or reduced, most of the respondents were in favour of keeping today’s level or answered that they did not know in Q1. Many argued that they were unsure whether Norwegian aid was effective in reducing poverty. Interestingly enough, after their return a vast majority were in favour of increasing development aid. Many students in Q2 pointed to the enormous wealth we have compared to people in Namibia. However, many of the students were still sceptical with regards to corruption and whether the development aid really reaches the people who need it the most:

“There is still a lot of corruption high up in the system, so I am a little sceptical as to how much that actually reaches the people that are supposed to have it. Therefore I don’t know how much development aid should increase today, but it should definitely not be reduced. There is some evidence that what we are giving is helping to some degree, so at least something is getting through.”.

One student was in favour of reducing the level of development aid after returning from Namibia and thus more negative toward development aid after the practicum than before. The reasons given for this attitude were:

“For the country to be able to stand on its own two feet there might be needed some more independence and ‘time alone’. Maybe then will they learn how to stand on their own feet and not be so dependent on support from western countries?”.

This is an interesting viewpoint which also resembles much of the debate regarding development aid in the political and public discourse in Norway in recent years. This question also needs to be interpreted carefully. A more positive attitude towards development aid could point in the direction of neo-colonial thinking: the Europeans need come and make things work. On the other hand, the quotes relive that empathy has been increased, and there is no doubt that they find the poverty situation in Namibia, as compared to Norway, morally problematic. This fits with the findings of both Bennett (2004) and Cushner and Mahon (2002), who emphasise the development of empathy as major effect of such programs.

### ***Developing self and relationships***

This part will look at the other half of Wilson’s (1993) model, where self-development and relationships are in focus. When asked to self-assess how confident they are when teaching, most of the respondents in Q2 were on the positive end of the scale, while in Q1 it was more spread. The same tendency could be recognized when they were asked if they considered themselves as persons who found it easy to lead others and take responsibility. There was a clear tendency toward a more positive self-evaluation on these aspects in Q2. This could indicate that there has been a development in self-esteem and confidence that also stretches beyond the purely educational aspects. The same tendency was recognised when the students were asked if they could see themselves living in another country than Norway. Before the stay in Namibia very few thought so. After the stay in Namibia half of the group thought that they could live outside Norway and quite a few reckoned that they could live in Africa.

This could point in the direction of more openness to other cultures, which is an important aspect of Wilsons (1993) model. The students generally reported that the experience had made them more open minded after their practicum than before. “I have seen the value of learning something from another culture than my own. This experience I feel has changed me as a person in a positive way.”.

When asked how this would affect their teaching we also found some interesting reflections. Most commonly the students reflected on how their teaching will become more interesting, as they have more concrete examples and knowledge about for instance development issues. But several students also mentioned that they have a more profound insight into personal relations and their

own role. One student wrote: “The stay in Namibia has tested me immensely. Both as a person and as a teacher.”. Another student mentioned that: “I have become more tolerant in relation to differences and challenges, I complain less.”.

When asked what has made the biggest impression during the whole stay the students are divided between the hope and positivity that Namibians show under demanding conditions, and all the poverty and despair that they also have witnessed. As stated by one student:

“The people appreciated everything, they seldom complained. It was a different working environment, a positive environment. The people were always polite, curious and accommodating. The difference in human nature made a strong impression on me. I have come home with a positive attitude towards unknown people, and I feel that I have to greet everybody. Unfortunately, I do notice that many people in Norway are much more spoilt and reserved.”.

Many said that the warmth of the people, the openheartedness and the friendly atmospheres they experienced contributed to a positive view of other cultures. However, a few of the students also reported that some aspects of the Namibian culture were problematic, especially related to gender issues and views on child rearing. “The people were unbelievably nice and welcoming! Everybody wanted to be your friend and help you. I think it is the views on children and gender equality that are still lagging behind.”.

In conversations several students told us that they witnessed corporal punishment in schools and kindergartens. This was a shocking experience for the students. This is totally unacceptable from a Norwegian educational point of view, but according to the students still quite common in Namibia. This could range from threats of physical violence, to minor blows and knocks, and to getting chilli powder in the mouth when answering back to the teacher.

In relation to teaching, the students were asked if they believed that the stay in Namibia would change their way of teaching global and multicultural issues. Before they left most of them expressed that they believed that the stay would make them more qualified to teach in a multicultural classroom and on global issues. The following quote is typical (Q1): “I believe that I will get a more positive attitude to multiculturalism and be able to convey this to my learners and help them to develop a positive attitude.”. In Q2 the same student answered:

“I can use my own experience when I teach; I can give my learners examples that will make my teaching more authentic. I will more than before clamp down on any racist attitude in the classroom. I believe that I can take another person’s perspective when I teach.”.

The ability and willingness to engage in interpersonal connections is a central aspect of the impact of an international experience according to Wilson (1993). We asked the students if they felt easy when being with people from other cultures. Before the stay in Namibia a majority answered slightly on the positive/yes side. After the stay most of the students had become more positive and said that they felt at ease when engaging with people from other cultures. Only one student had become more negative after the practicum than before. Most students also had become more positive when asked if they felt it was important to make an effort to get to know people from other cultures, for instance on holiday. Most had also become more positive to the importance of having daily contact with people from other cultures than their own.

### **Conclusions and implications for teacher education**

Most students who took part in the international practicum in Namibia in the spring of 2014 increased their professional self-efficacy, became more empathetic and began questioning stereotypes of others. Their experience in Namibia raised their appreciation of cultural diversity and many of them believe that it will make them better teachers in a multicultural classroom. Some also express that they are better qualified to communicate with people from other cultures than before they left for Namibia. We also find that most students seems to express more confidence in teaching, leading and being in a multicultural setting after the practicum than before. This can indicate that personal growth and maturity are important outcomes of the international practicum.

Furthermore, the stay has increased global awareness and strengthened their global perspective. Most of them also express a more open attitude towards otherness. Whether or not

they have become less chauvinistic is difficult to read from our data, but more than before they say that they can see themselves living in another country than Norway and many reported increased tolerance and openness to other cultures. This might indicate that the stay has transformed their perspectives, and given them a new frame of reference that is more integrative and open to other points of view (Mezirow 1997). On the other hand, an increased emphasis on internal causes of poverty and a more critical attitude to Namibian educational practices after the practicum than before, might be interpreted as more ethno-centric and neo-colonial thinking. However, the material is too limited to draw any valid conclusions on this aspect, as it does not offer the possibility to discriminate proxy causes from more fundamental ones. In the next round of in-depth interviewing this is an issue that will be followed up more concretely.

The findings presented here are a result of a small qualitative study. It is therefore too early to draw firm conclusions on the effect of sending teacher students on international practicum to Namibia. The findings are based on two qualitative questionnaires and a focus group interview. Methodologically this type of study is challenging and it is especially difficult to ask valid questions on complex aspects of a person’s personal development and attitudes. The findings presented here must therefore be taken as merely tentative findings.

However, our findings are in accordance with other studies which suggest that international service learning programs are potentially transformative in nature. First-hand knowledge is seen as critical in developing intercultural competence. Participation in international work increases learners’ intercultural competence, appreciation of cultural differences, tolerance of ambiguity, and experiential understanding of complex global problems. Living and working in a different culture challenges the perception of oneself, of others and of the home culture and country. They develop “perspective consciousness” which helps them to understand other cultures and conflicting viewpoints (Walters et al. 2009; Stachowski and Sparks 2007).

According to the European Commission, as well as Norwegian education authorities, international student exchanges are an important tool in equipping students with the skills and knowledge essential to working and living in a multicultural and globally interconnected world. This competence is especially important for future teachers. The international practicum program at Hedmark University College is one example of how intercultural competence and global awareness might be strengthened in teacher education. It is therefore our recommendation that teacher education institutions of various kinds develop similar programs.

## References

- Abdallah-Pretceille, M. 2006. “Interculturalism as a paradigm for thinking about diversity.” *Intercultural Education* 17 (5): 475-483.
- Bennett, M. 2004. “Becoming interculturally competent.” In *Toward multiculturalism: a reader in multicultural education*, edited by J. Wurzel, 62-77. Newton MA: Intercultural Resource Cooperation.
- Chieffo, L., and L. Griffiths. 2004. “Large-scale assessment of student attitudes after a short-term study abroad program.” *The Interdisciplinary Journal of Study Abroad X*: 165-177.
- Cushner, K. 2007. “The role of experience in the making of internationally-minded teachers.” *Teacher Education Quarterly*, Winter 2007: 27-39.
- Cushner, K., and J. Mahon. 2002. “Overseas student teaching: affecting personal, professional, and global competencies in an age of globalization.” *Journal of Studies in International Education* 6 (1): 44-58.
- Cushner, K., and J. Mahon. 2009. “Intercultural competence in teacher education”. In *The SAGE handbook of intercultural competence*, edited by D. Deardorff, 304-320. LA: Sage.
- Deardorff, D. 2004. “In search of intercultural competence.” International educator. <http://oregonstate.edu/instruct/pp/ctla-files/reading/reading-deardoff.pdf>
- Hammer, M., M. Bennett, and R. Wiseman. 2003. “Measuring intercultural sensitivity: the intercultural development inventory”. *International Journal of Intercultural Relations* 27: 421-443.

- Kambutu, J., and L. Nganga. 2008. “In these uncertain times: educators build cultural awareness through planned international experiences”. *Teaching and Teacher Education* 24 (4): 939-951.
- Keese, J., and J. O’Brien. 2011. Learning by Going: Critical Issues for Faculty-Led Study-Abroad Programs. *The California Geographer* 51: 3-24.
- Kitchin, R., and N. Tate. 2000. *Conducting research in Human Geography: theory, methodology and practice*. London: Prentice Hall.
- Leutwyler, B., and C. Meierhans. 2013. “Exchange students in teacher education. Empirical evidence on characteristics and motive structures.” *Educational Research* 4 (1): 1-11.
- Merryfield, M. 2000. “Why aren’t teachers being prepared to teach for diversity, equity, and global interconnectedness? A study of lived experiences in the making of multicultural and global educators.” *Teaching and Teacher Education* 16 (4): 429-443.
- Merryfield, M. 2008. “Scaffolding social studies for global awareness.” *Social Education* 72 (7): 363-366.
- Mezirow, J. 1981. “A critical theory of adult learning and education.” *Adult Education* 32 (1): 3-24.
- Mezirow, J. 1997. “Transformative learning: theory to practice.” *New Directions for Adult and Continuing Education* (74): 5-12.
- Mezirow, J. 1998. “On critical reflection.” *Adult Education Quarterly* 48 (3): 1-10.
- Pence, H., and I. Macgillivray. 2008. “The impact of an international field experience on preservice teachers.” *Teaching and Teacher Education* 24 (1): 14-25.
- Quezada, R. 2004. “Beyond educational tourism: lessons learned while student teaching abroad.” *International Education Journal* 5 (4): 458-465.
- Sinicrope, C., J. Norris, and Y. Watanabe. 2007. “Understanding and assessing intercultural competence: a summary of theory, research, and practice.” *Second Language Studies* 26 (1): 1-58.
- Stachowski, L., and T. Sparks. 2007. “Thirty years and 2,000 student teachers later: an overseas student teaching project that is popular, successful, and replicable.” *Teacher Education Quarterly* Winter 2007: 115-131.
- Taylor, E. 1994. “A learning model for becoming interculturally competent.” *International Journal of Intercultural Relations* 18 (3): 293-328.
- Walters, L., B. Garii, and T. Walters. 2009. “Learning globally, teaching locally: incorporating international exchange and intercultural learning into pre-service teacher training.” *Intercultural Education* 20 (1-2): 151-158.
- White Paper no. 11. 2008-2009. *Læreren Rollen og utdanning*. Oslo: Kunnskapsdepartementet.
- Willard-Holt, C. 2001. “The impact of a short-term international experience for preservice teachers.” *Teaching and Teacher Education* 17: 505-517.
- Wiggins, R., E. Follo, and M. Eberly. 2007. “The impact of a field immersion program on pre-service teachers’ attitudes toward teaching in culturally diverse classrooms.” *Teaching and Teacher Education* 23 (5): 653-663.
- Wilson, A. 1993. “Conversation partners: helping students gain a global perspective through cross-cultural experiences.” *Theory into Practice* 32 (1): 21-25.

[Back to contents](#)





## **Practicum as transition**

*Sirkku Männikkö Barbutiu*

*Stockholm University, Sweden*

sirkku@dsv.su.se

### **Abstract**

Practicum in teacher education is an important part in becoming a teacher. It is also a contested part of the teacher education with several stakeholders involved. This paper reports on a study that scrutinizes the mentoring dialogues within practicum in an effort to understand the dynamics and contents of these dialogues with the aim of contributing to the development of practicum. A number of authentic dialogues have been analysed. Findings show that the guidelines defined by the teacher education institution and the teacher educator steer the mentoring dialogues. The focus is on summative assessment even though the rhetoric of the practicum suggests that the dialogues could be student driven and focused on further professional formation of the student. The study is part of an international, comparative research project where practicum and its transformation potential as an empowering, communicative space for professional development is subject to inquiry.

**Keywords:** student teacher; mentoring dialogues; practicum; teacher education.

### **Context of the research**

This paper reports on a study of mentoring dialogues with the aim of understanding how the mentoring dialogues are staged in the communicative space of practicum. The knowledge of mentoring dialogues will support us in further developing the practicum experience of student teachers.

In our previous research, we have claimed that practicum is both under-developed and under-theorised (Mattsson, Eilertsen, and Rorrison 2011). This study builds on earlier international collaborative projects aimed at understanding the development of professional practice knowledge during the practicum in teacher education. Notions that emerge in these studies as critical include “communicative spaces”, “empowering relationships” and “memorable/purposeful encounters” (Männikkö-Barbutiu and Rorrison 2011). For further exploration of these concepts, we have initiated research on the mentoring dialogues between student teachers and their supervisors during the practicum.

Our research on student teachers’ practicum experiences suggests that the mentoring dialogue (Carsborn and Hennissen 2010) between the student teacher, mentoring teacher at school and the teacher educator at the teacher education institution does not always support the development of student teacher but leaves the central experiences during the practicum unprocessed. Thus, teacher education misses an important opportunity to enhance learning of the student teachers and helping them with the transition from a novice to a professional teacher (Männikkö-Barbutiu and Rorrison 2011).

Recent developments in teacher education imply that practicum could again be considered as a central part of teacher education (referred to as the practicum turn (Mattsson, Eilertsen and Rorrison 2011). The latest reform (in 2011) in teacher education in Sweden intends to change the position of practicum from a fragmented part included in all the courses within a teacher education programme into a separate, unified entity with its own specifically defined goals. The practicum architecture (Kemmis and Grootenboer 2008) includes new features that are considered as supportive and developmental to the practicum experience of student teachers. The mentoring dialogue now includes the student teacher, the mentoring teacher at the school where the practicum is taking place and the teacher educator from the teacher education institution. Mentoring dialogues have an assessment purpose but they should also be developmental in nature and give student teachers guidance during the practicum (Jönsson and Mattsson 2011). Mentoring teachers are to be trained in mentoring through a specific course that intends to add to the participatory and

empowering dimension of practicum as a tool for school development. Another feature that has been introduced is the digital portfolio, which is offered as a tool for documentation and reflection for student teachers. The reflective paradigm within mentoring (Pajak 1993) has long been prevailing but unsuccessful in bringing systematic and contextual meaning to the actual exercise of reflection.

### Research questions

In the pilot phase of this inquiry we have been asking mentoring teachers and teacher educators how they see the mentoring dialogue and how they would like to develop it (identification, praxis and vision). This pilot included a number of mentoring teachers and teacher educators in Sweden and in Australia. The analysis of their responses suggests that there exists a general agreement on the importance of the mentoring dialogue and the experiences of the student teachers during the practicum. However, the practicum architecture and other institutional conditions influence, if not hinder, the realization of the visions and the actual praxis remains a shallow compromise between various interests and requirements. The results from the pilot trigger several issues about the mentoring dialogues: What is the nature of these dialogues? Are they mainly occasions of assessment or do they function as advisory and formative conversations? What is the content of dialogues? How can the roles of mentors, teacher educators, and students be characterised? What is the role of mentoring dialogues in becoming a teacher, in the professional development of student teachers?

The focus of our research interest is thus on the communicative space that is formed in the meeting of the three actors: student teacher, teacher educator and mentoring teacher at practicum school. The figure (Figure 1) below illustrates the meeting of the three actors and the formation of the communicative space in the very centre, where the mentoring dialogues are taking place. The figure also shows the other three spaces (shadowed) of interaction and communication that are possible and in use between the three actors: the space between the student teacher and the mentoring teacher; the space between the teacher educator and the mentoring teacher; and the space between the teacher educator and the student teacher. It needs to be added that the communicative space in practicum includes all the other actors and relations that are present in the school context. However, the figure here also illustrates the only meeting between the three actors present in the mentoring dialogue: student teacher, mentoring teacher and teacher educator.

The focus of this paper is the meeting between the three actors: student teacher, mentoring teacher and teacher educator in the context of the mentoring dialogue which is regulated through steering documents and formed in the individual practices of the participants. In order to understand this meeting point we ask following research questions: How the mentoring dialogues are staged in the communicative space of practicum? What are the roles of the participants? What is the content of the dialogues?

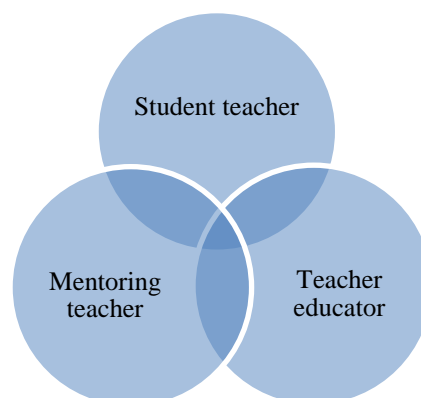


Figure 1. Communicative space in practicum

## **Theoretical framework**

In this section I will describe the practicum and the mentoring dialogues as they are presented in the formal documents of the teacher education program. This description will give a frame and a background for the phenomenon studied. In 2010, a new model for practicum assessment was introduced in teacher education within the institution under study. As the practicum now constituted an independent course, it was important to collect coherent documentation from the whole practicum period for the assessment. The assessment model consists of three parts: a digital portfolio for documentation (student teacher owns the portfolio); mentoring dialogue as part of the follow-up and assessment of practicum (student teacher, mentoring teacher and teacher educator meet), and a practicum report (the official document reporting student’s learning outcomes) as support for the documentation and assessment of practicum.

### ***The guidelines for mentoring dialogues***

The following description of the practicum dialogues can be regarded as the official version of the mentoring dialogues. This is how the organizing institution of teacher education defines the dialogues and their role in the program (Oredsson Blomberg 2014). Of course, this is how the participants strive to conduct the dialogues in the frame of their own interpretations of the guidelines and their conditions and possibilities.

A mentoring dialogue is conducted between student teacher, teacher educator from the university and the local teacher educator (mentoring teacher). The assessment model consists of two dialogues during the three and a half year teacher education program for the preschool teachers. The student teacher is asked to prepare for the mentoring dialogue by conducting a self-evaluation based on his/her individual study plan. Evaluation should include descriptions of situations where the student teacher thinks that he/she reaches the goals (the expected learning outcomes). According to the guidelines, the self-evaluation should be submitted into the digital portfolio at least three days before the mentoring dialogue. The mentoring dialogue is led by the student teacher and is based on the self-evaluation of the student teacher.

The overall purpose of the mentoring dialogue is that the teacher student should reflect on and be able to assess his/her practicum and professional development on the basis of the expected learning outcomes defined for the practicum and on the basis of the professional development matrix. The recurrent mentoring dialogues should contribute to continuity and progression in the professional development of the student teacher. Mentoring dialogues should have the character of a formative development dialogue with the following objectives: to support the development of the teacher student through discussions of his/her strengths and areas of development and possible ways for future action; to assess students’ prospects for realising the learning outcomes for the practicum course and the practicum period.

### ***Preparations***

A prerequisite for a good mentoring dialogue is that all parties are well-read in the student’s self-evaluation, the course’s expected learning outcomes, and the professional development matrix. It is the teacher educator at the university who is responsible for informing both the student teacher and the mentoring teachers at schools of the purpose, contents, and the structure of the mentoring dialogue.

#### ***Self-evaluation***

Prior to the mentoring dialogue, the student teacher writes a self-evaluation in a form of reflections on his/her development starting with the individual goals, the expected learning outcomes of the course and with the support of the matrix. This is done in collaboration with the mentoring teacher at the practicum school.

### *Points of departure for the mentoring dialogue*

Points of departure for the conversation are the self-evaluation done by the student and the expected learning outcomes of the practicum. Both strengths and areas of further development should be discussed during the conversation.

### *Structure for the mentoring dialogue*

The teacher educator begins by clarifying the purpose and scope of the mentoring dialogue and is responsible for ensuring these are followed. The student teacher states what he/she wants to take up during the conversation. The student's responsibility for content and implementation increases from first to last dialogue during the teacher education program.

Student, mentoring teacher and teacher educator are jointly responsible for ensuring that all three have a voice in the conversation, and that the conversation gives a comprehensive and problematizing picture of the student's efforts during the practicum. It is also important that the formative purpose of the dialogue can be achieved.

At the end of the conversation, all three parties should be given an opportunity to give a summary of the conversation. The oral statement of the mentoring teacher about the progress of the student is documented in a specific form (practicum report) by the teacher educator.

According to a report on the expected learning outcomes of the practicum by the teacher education organiser, mentoring dialogues should be seen as formative (underlined by the author) assessments rather than summative ones (Stockholm University 2013).

### ***Communication and the mentoring dialogue***

Our understanding of the communicative space draws on Habermasian theory of communicative action. The central concept in Habermas' theory is that “communicative action” serves to transmit and renew cultural knowledge, in a process of achieving mutual understandings. It then coordinates action towards social integration and solidarity. Finally, communicative action is the process through which people form their identities (Habermas 1987, 140). Habermas' notion of a deliberative communicative action is further developed in the context of action research (see for example Kemmis and McTaggart 2005).

Another central concept is “lifeworld” which depicts the subjective, individual and autonomous human consciousness in contrast to the “system” world that represents the economic, hierarchical and oppressive forces in a society. Habermas thus describes the modern society as a two-level construction where these two - lifeworld-level and system-level - operate. According to Habermas, there is a tension between the two, and he calls for independent utterances of will by autonomous groups in order to counterbalance the institutionalised global systems (of media, for example).

In the case of mentoring dialogues, we could argue that the individual lifeworlds of the three actors - student teacher, teacher educator and mentoring teacher - encounter not only each other but also the system of practicum and teacher education, which conditions the communicative actions/mentoring dialogues. Habermas suggests that there is a deliberative potential in the communicative action leading towards social integration and solidarity. This gives us an opening to attach transformative hopes to the mentoring dialogues as empowering third spaces where “... where the potential for an expanded form of learning and the development of new knowledge are heightened” (Gutiérrez 2008, 152). Such spaces should be designed to foster communicative freedom among participants, which in turn engenders communicative power and legitimacy for the ideas and practices they develop through their communicative action (Habermas 1996; Kemmis and McTaggart 2005).

### **Research methodology**

The data in this study has been collected in authentic situations during the spring term 2013 within the preschool teacher education programme at Stockholm University, Sweden. The sample

consisted of 20 student teachers in their second term of studies. This was their first mentoring dialogue. Prior to the dialogues, an ethics approval was administered by their department. The ethical guidelines for research in social sciences have been applied securing the anonymity of the participants and guaranteeing that the study will in no way influence the study results of the participating student teachers. As the study received the approval, the teacher educator who was to conduct all the dialogues, sent an introductory letter to the student teachers and their mentoring teachers about the coming mentoring dialogue and the study that was to be conducted. A letter of consent with short information was enclosed. The letter of consent was to be returned to the teacher educator before the dialogue but in practice, letters were collected when the participants met for the dialogue. Eighteen out of the 20 student teachers gave their consent to the audio recording of the mentoring dialogue.

The mentoring dialogues took place at the practicum school of each student. The duration of the meeting was approximately 60 minutes. Present were the student teacher, teacher educator from the university and the mentoring teacher/s of the respective student teacher who were teachers at the practicum placement school. The teacher educator administered the recording of the mentoring dialogue.

The analysis is based on the 18 authentic mentoring dialogues that have been (audio) recorded. The audio recordings have been carefully transcribed. Transcripts have then been subjected to detailed, repeated readings in order to find the central themes, which have been analysed and interpreted through grounded research methods (Bryant and Charmaz 2012; Silverman 2011). The focus of the qualitative analysis of the mentoring dialogues has been on the relations and interactions between the participants. In the analysis of the conversations we have looked for who is the initiator of a conversational sequence, turn taking in conversation, and who brings up new themes. We also looked for the tone of the conversation by identifying factual questions, advice, encouragement, affirmation and appraisal. Thirdly, we have analysed the content of the dialogues: what were the topics of conversations.

## Findings

In this section, we will report the results of our findings and answer the three research questions: How the mentoring dialogues are staged in the communicative space of practicum? What are the roles of the participants? What is the content of the dialogues?

### *How the mentoring dialogues are staged in the communicative space of practicum?*

The analysis of the 18 conversations shows that the conversations are conducted in a polite and friendly atmosphere. Although the mentoring dialogue is meant to be a formative assessment, it still carries the name of assessment, which puts some pressure on the student teacher. In most of the conversations, the student teacher is showing some insecurity and nervousness, and the teacher educator is easing the situation by a lot of laughs. The conversation is moving from one subject to another following the self-evaluation the student teacher has prepared for the occasion. The teacher educator poses a question addressing the student teacher and the student teacher gives an answer. Often the answer is quite short, even a simple yes/no. Then the teacher educator moves to a next subject. This gives an impression of a fairly superficial discussion. There is never any deeper elaboration of a subject. The mentoring teacher enters the discussion only occasionally to clarify or amplify something the student teacher has said. After having gone through the whole self-evaluation document, the teacher educator asks the student teacher and the mentoring teacher if there is anything else they wish to add. Usually they decline.

The final part of the conversation is dedicated to the professional development matrix, which is again introduced by the teacher educator as an instrument for the follow-up of the student's progression in the professional skills and competences. This part of the conversation relates to the future: what are the areas that the student teacher needs to focus on during the rest of the practicum period. As a concluding act the teacher educator asks the mentoring teacher if she thinks that the student teacher has reached the goals for this practicum period. In every case the answer is positive

and the goal document is signed by the participants as a confirmation of the positive outcome of the assessment.

The mentoring dialogue is concluded in high spirits. There is relief in the air. The following quotation demonstrates this:

“Teacher educator: Now then, we have done this well. How was this conversation for you N (student teacher)?  
 Student teacher: Yes, it was better than I thought. We were making up most dreadful scenarios on Friday, well me and U (a peer) were discussing how it would be. You think that they are going to be like...  
 Mentoring teacher: (interrupting the student): Well, I told you that this is a nice conversation. I have done these before and there is nothing to be afraid of.  
 Student teacher: But you don't know and then you just think of the worst possible.  
 Teacher educator: Well, you survived, I can see that.  
 Student teacher: Absolutely!”

The main structure of the dialogues that we have studied is the same. They repeat a certain pattern with a beginning, the main part, and the end. The following Figure 2 illustrates this:



Figure 2. A mentoring dialogue pattern

The analysis indicates that the introductory mentoring dialogue is set up by the teacher educator, who represents the institutional organisation and makes the interpretation of the goals and structure and process defined in the steering documents. She takes the lead. Even though the practicum rhetoric emphasises that the mentoring dialogue is owned by the student teacher, it is the teacher educator who sets the agenda and sets the stages the communicative space of practicum dialogue.

### ***What are the roles of the participants? What is the content of the dialogues?***

Even though the practicum rhetoric emphasises that the mentoring dialogue is owned by the student teacher, the analysis confirms that it is the teacher educator who sets the agenda in these conversations. There is quite a lot of uncertainty and nervousness among the student teachers. They do not know what the dialogue is about and understand it as a pure assessment situation where their performance during the practicum is being assessed by an outside authority, which represents the teacher education institution. The teacher educator has no prior knowledge of the student teachers she meets other than what she can find in the written self-evaluations from the student teachers (Interview with the Teacher Educator).

Mentoring teachers are also uncertain of the form and purpose of the dialogue and they keep themselves in the background during the dialogue. They fill in, clarifying and amplifying the student teacher's sayings, and only seldom do they take initiative in the discussion. It happens that they give appraisal to their student. Their attitude is always supportive and encouraging.

Teacher educator takes a multiple role in the dialogue: she an advisor, a coach, and an expert all during a single dialogue. She gives concrete advice to the student teacher in the various aspects of the practicum. She is also very supportive, like a coach doing pep talk and encouraging a student teacher that might be feeling insecure in front of different situations in the school. The mentoring teacher acts as an authority, an expert in the field of teaching and learning, which both the student teacher and the mentoring teacher recognise by never questioning her. She decides what is discussed from the student's self-assessment document. She asks for clarifications, explanations, and elaboration of issues that the student teacher has described in the document. The following quotation gives an example of how a typical conversation can develop between the participants, in

this case, between the teacher educator and the student teacher:

“Teacher educator: Ok, I read here what the student is required to be able to do after the practicum course: be able to participate in planning and implementation of everyday activities in preschool and reflect over the career choice based on the past experiences... yes, you write that you have participated in a lot of things here.

Student teacher: Yes, it has happened a lot here (laughs).

Teacher educator: It has, hasn't it (laughs) and you have participated a lot it says here and you think that it has worked well. How do you think you could describe what is well? Yes, because I get curious when you write “well” (laughs).

Student teacher: Well, what did I think...

Teacher educator: You write like this...I have participated in the everyday activities, gatherings, play, putting the clothes on and off - I think it has worked well.

Student teacher: Yes, I don't think that I have had direct problems with children and it has worked well with the personnel when we have done different activities, and ... children include me when they do things and ...

Teacher educator: You are allowed to participate everywhere

Student teacher: Yes

Teacher educator: And do you do something special yourself? Do you think apropos awareness and all that... (laughs)

Student teacher: (laughs) I don't know about that but they remember me from the previous time I was here, some of them do and they remember my name and what I did last time which is really nice.

Teacher educator: Oh, when was this?

Student teacher: I was here in December.

Teacher educator: Oh, I see

Student teacher: So it is not such a long time between... so they recognize me and then it is easier to build a relation with them again.” (Mentoring dialogue 25, 2-3).

This excerpt from a mentoring dialogue is typical in several aspects. First of all it shows how the teacher educator tries to make sense of the written self-evaluation of the student by asking additional questions. It is important for her to understand what the student is trying to mediate with the self-evaluation and further how the content relates to the expected learning outcomes of practicum. From this she then needs to make the assessment whether the student has fulfilled the expected learning outcomes of the practicum.

In this particular sequence, the teacher educator tries to make the student explain in more detail what she means by “well”. The student is not really sure how to answer and the teacher educator tries to help her by reading from the self-evaluation. What this leads to is only the realization that the student had been in the preschool before and that the children knew her which made things easier. After this they move on to a next subject.

One might have expected a further elaboration on the subject: how continuity is important for establishing a sense of security and trust among the children; or trying to think how the student had done the first time in order to enter the group. However, these kinds of elaborations do seldom take place during the dialogues. Consequently, the dialogues tend to maintain a superficiality that does not give much support to professional formation of the student teacher.

An example of an effort of making conversations formative could be the “translation” work done by the teacher educator. What takes place in all the dialogues that we have analysed is that the teacher educator often “translates” the sayings of the student teacher into more professional language. We can interpret this as an intentional strategy from her part in order to familiarise the student teacher with the language of the profession or is it just a byproduct of the effort to understand what the student teacher is trying to express in the self-evaluation?

In all the dialogues that we have analysed, the student teacher clearly takes the role of the one to be assessed. This is the role of a subordinate, which manifests so clearly in the short “yes” and “no” answers that most of the questions from the teacher educator manage to emanate. There are seldom any longer reasoning taking place, which gives the discussion a notion of superficiality.

The third person in the room, the mentoring teacher, takes the role of a witnessing, background figure in the dialogue. She sometimes interprets what the student is saying giving the short “yes and no” answers more substance and linking them to concrete situations in school. She may add some factual information about the school, the staff, and the ways of working as a representative of the practicum school. She may also bring concrete examples from the everyday



practicum life to the discussion. These examples of various situations in the practicum are descriptions and they are never analysed during the mentoring dialogue. The practicum supervisor may also signal how good the collaboration between the student teacher and herself actually is, thus adding a piece to the assessment. This is the part where the mentoring teacher plays a more significant role in describing the communicative space that is shared by the student teacher and the mentoring teacher in their daily interactions during the practicum. The teacher educator has no knowledge of this space other than what is written in the self-evaluation and what is told to her during the mentoring dialogue. This is why it is of great importance to mentoring teachers to get the chance to “speak up” during the mentoring dialogue. Some of them do it very clearly, as is shown in the quotation:

“... I feel that we have talked about this in and out... and I think that we have a very good communication, yes,... I think that you are so conscious, you reflect upon yourself all the time, how you work, how you interact with the children, how you interact with the parents, so I feel that we have a living conversation all the time...” (Mentoring teacher 25: 13).

The very final part of the mentoring dialogue is used for examining the professional development matrix. Here, again, the teacher educator is the one leading and explaining the matrix. The student teacher and the mentoring teacher do not seem to know the matrix very well. Students have been introduced to it briefly before the practicum period but do not seem to have any deeper insight of its contents nor its function in the teacher education program.

In sum, our analysis of the 18 mentoring dialogues shows that the dialogues are staged in the communicative space of practicum according to a certain pattern where the two documents, the student teacher’s self evaluation and the development matrix, are in focus. The role setting gives the teacher educator the main part as she leads the conversation from the beginning to the end following the guidelines and steering documents. The content of the conversation is about the self-evaluation document and the achievements that the student teacher has made. Only at the very end of the dialogue is the focus turned to the future and what the student teacher could be doing during the rest of the practicum period.

### *Discussion*

A conversation is always characterised by the participants, how they are as individuals, but also by their institutions, the society, and the time in history. Participants in a mentoring dialogue have their different positions and different tasks in the teacher education system. All this, of course, reflects in the conversations. In Habermas’ words, the lifeworlds of the three actors meet in the mentoring dialogue; the student teacher in her position as a novice and the two professionals, the teacher educator and the mentoring teacher who partly come to the meeting as individuals with their “subjective, individual and autonomous consciousness” but also as representatives of the system world of educational institutions with their ‘economic, hierarchical and oppressive forces.

The system world of the teacher education becomes operational through the teacher educator as she takes the leading role in the dialogue. She represents the official teacher education, bringing in the rules and regulations and the steering documents like the expected learning outcomes and the professional development matrix. She summons the participants and she orchestrates the whole mentoring dialogue. She decides the structure and the content, and she tends to conduct the dialogue in the same manner. There is a certain pattern that is followed each time. There is an informal introduction part during which the short introductions are made. After that the self-evaluation is examined and the teacher educator poses questions and asks for clarifications and elaborations in order to understand in which ways the student teacher has managed to reach the set goals and realised the expected learning outcomes.

The mentoring dialogue can be described as “a communicative action”, which serves to transmit and renew cultural knowledge of the teaching profession. The conversation is called in Swedish “treparsamtal” which translates into “three-part-conversation”. The reason for using the word “mentoring dialogue” instead of “three-part-conversation” in this paper is to conform to the wider audience and contexts where the term is applied. The Swedish term is neutral in the sense that it only describes the actual number of participants “three” and the nature of the activity

“conversation”. The term does not give any clues to the actual nature of the conversation or the content of it. The English term is more demanding on this point. The word “mentoring” defines the conversation. The question then raises how this “mentoring” is understood and implemented. The word “dialogue” also defines the communication as a two-way one and not a monologue.

In the Swedish conversations, the mentoring or counselling aspects are diminutive. We could characterise the mentoring dialogues as affirmative and confirming rather than mentoring and counselling. This is certainly due to the fact that the conversation is to be an assessment and consequently the focus lies on the goal achievement of the student teacher: what has the student done this far and what needs to be done next? The steering documents, however, emphasise the mentoring aspect, which does not come to realisation in the dialogues that we have analysed. One explanation for this could be the time aspect. One-hour conversation does not give much room for elaboration of any subject. This is where the potential of the communicative space could be developed so that it can be transformed into a true “third space” and support student teachers in their transition from novices into professional teachers. As the model of mentoring dialogues is still new, there is room for further development of the dialogues. Our study raises a general concern of how teacher education can support student teachers in their transition from a novice to a professional teacher. In the case of mentoring dialogues, it is important to understand the mechanisms of the dialogues as communicative actions and how the communicative space could be scaffolded in order to support the transition. Our analysis show that the dialogue is superficial without a real focus, which raises the question how does this kind of conversation support and guide the student. A discussion of the fruitful linkages between practice knowledge and academic knowledge in teacher education suggest that there exists potential for a development of the communicative space (Darling-Hammond, et al. 2005; Zeichner 2010). Technology might be able to provide solutions to enhance and focus the communication. Could some digital practices support the dialogues? Despite the introduction of digital portfolios for documentation, in the mentoring dialogues participants seem to rely on paper versions. For example, could the introduction of video clips from the student’s practicum help to focus the conversation and make it more engaging and meaningful? An authentic situation from the students’ own practicum could both illustrate student’s real progress for the assessing teacher educator but also provide an opportunity to discuss a situation of real concern for the student teacher and become a true mentoring session where the two professional teachers can contribute with their knowledge to the novice.

### **Conclusions and implications for teacher education**

The mentoring dialogues that have been analysed in this study were the very first ones for these student teachers and in many cases even for their mentoring teachers. This may partly explain the tentative nature of their conversations. It is also important to note that the dialogues involved the same teacher educator in each case. Others may react and organize differently.

For a fruitful continuation it is important to scaffold the conversations so that they can bring true contributions to the professional development of the student teachers. Having a deep conversation between professionals should be the goal, the creation of the third space in Gutierrez’s words: “...where the potential for an expanded form of learning and the development of new knowledge are heightened” (Gutiérrez 2008, 152).

In our further work we wish to interview the participants of the mentoring dialogues in order to understand more about the meaning of the mentoring dialogue. We want to learn more about how each participant understood the dialogue; the dialogues are linked to the continuation of the practicum and how they see the coming dialogues.

### **References**

- Bryant, A., and K. Charmaz. 2012. *The SAGE handbook of grounded theory*. London: Sage Publications.
- Carsborn, F., and P. Hennissen. 2010. *The skilled mentor. Mentor teachers’ use and acquisition of*

- supervisory skills*. Eindhoven: Eindhoven School of Education.
- Darling-Hammond, L., K. Hammerness, P. Grossman, F. Rust, and L. Shulman. 2005. “The design of teacher education programs.” In *Preparing teachers for a changing world*, edited by L. Darling-Hammond and J. Bransford, 390-441. San Francisco: Jossey Bass.
- Gutiérrez, K. 2008. “Developing sociocultural literacy in the third space.” *Reading Research Quarterly* 43: 148-164.
- Habermas, J. 1996. *Between facts and norms: contributions to a discourse theory of law and democracy*. Cambridge: The MIT Press
- Habermas, J. 1987. *The theory of communicative action. Liveworld and system: a critique of functionalist reason*, vol. II. Boston: Beacon Press.
- Habermas, J. 1984. *The theory of communicative action. Reason and the rationalization of society*. Vol. I. Boston, Massachusetts: Beacon Press.
- Jönsson, A., and M. Mattsson. 2011. “Assessing teacher competency during practicum.” In *A practicum turn in teacher education*, edited by M. Mattsson, T. Eilertsen and D. Rorrison, 169-186. Rotterdam: Sense Publishers.
- Kemmis, S., and P. Grootenboer. 2008. “Situating praxis in practice.” In *Enabling praxis. Challenges for education*, edited by S. Kemmis and T. Smith, 37-62. Rotterdam: Sense Publishers.
- Kemmis, S., and R. McTaggart. 2005. “Participatory action research. Communicative action and the public sphere.” In *Handbook of qualitative research*, edited by N. Denzin and Y. Lincoln, 559-603. Boston: Sage Publications.
- Männikkö-Barbutiu, S., and D. Rorrison. “Memorable encounters. Learning narratives from preservice teachers’ practicum.” In *A practicum turn in teacher education*, edited by M. Mattsson, T. Eilertsen and D. Rorrison, 45-66. Rotterdam: Sense Publishers.
- Mattsson, M., T. Eilertsen, and D. Rorrison. 2011. *A practicum turn in teacher education*. Rotterdam: Sense Publishers.
- Oredsson Blomberg, G. 2014. *VFU-handboken Från novis till professionell för lärarstudenter antagna vid Förskolläraprogrammet*. VFU-handböcker. [http://www.su.se/polopoly\\_fs/1.204648.1411729764!/menu/standard/file/VFUhandbok%2C%201%C3%A4rarstudenter%20antagna%20till%20F%C3%B6rskoll%C3%A4rarutbildningen25-9.pdf](http://www.su.se/polopoly_fs/1.204648.1411729764!/menu/standard/file/VFUhandbok%2C%201%C3%A4rarstudenter%20antagna%20till%20F%C3%B6rskoll%C3%A4rarutbildningen25-9.pdf).
- Pajak, E. 1993. *Approaches to clinical supervision: alternatives for improving instruction*. Norwood: Christopher-Gordon.
- Silverman, D. 2011. *Interpreting qualitative data*. Thousand Oaks: Sage Publications.
- Stockholm University. 2013. *Förväntade studieresultat och examinationsformer för verksamhetsförlagd utbildning*. Dnr: SU FV-6.7-1409-13. Stockholm: Stockholm University.
- Zeichner, K. 2010. “Rethinking the connections between campus courses and field experiences in college- and university-based teacher education.” *Journal of Teacher Education*: 89-99.

Back to contents

## **Sustainable mentoring in kindergartens and schools: an equal partnership**

*Magne Jensen, Thorbjørn Karlsen & Geir Luthen*

*Østfold University College, Norway*

magne.jensen@hiof.no, thorbjorn.karlsen@hiof.no & geir.luthen@hiof.no

### **Abstract**

The purpose of this study has been to develop insight into the extent to which multi-professional networks contribute to the learning and development of mentoring. The target group for the study has been owners, managers, mentors and employees in kindergartens and schools in Østfold County. The methodological strategy has been participatory action research, with a phenomenological approach to the material. Through the use of logs and open questions we revealed three categories that we wanted to examine in relation to learning about mentoring in multi-professional networks: motivation, relations and polyphony. The main findings of the study and our discussion regarding these three categories indicate that multi-professional networks provide contributions to both individual and collective learning about mentoring.

**Keywords:** mentoring; multi-professional networks; participatory action research.

### **Context of the research**

The project Mentor Network Østfold was established in 2012. The target group for the project is school- and kindergarten owners, managers and mentors in Østfold County. A central empirical basis for the project was a survey conducted in 2011, aimed at teachers and kindergarten teachers who graduated as mentors in 2007-2010. The project Mentor Network Østfold is a central part of the regional mentoring program New Teacher (Bjerkholt and Karlsen 2003), which is a collaboration between the university colleges in the counties of Buskerud, Telemark, Vestfold and Østfold. The regional mentoring program is part of the national program Mentoring Newly Qualified Teachers in kindergartens and schools (Bjerkholt 2002).

Interesting trends in the survey indicate that a clear majority of the mentors in Østfold County did not participate in any form for professional mentoring networks. Of these, most mentors wished to participate in such networks, and they wished for follow-ups and support from the university college.

Østfold University College's responsibility and participation in the project Mentor Network Østfold was carefully reviewed, and in collaboration with the professional community, it was decided that the professions were a central supplier to the content and form of establishing professional mentoring networks in the project. It was an emphasized objective that the professional field should experience a sense of ownership and be a creative force. At the same time, the project is an equal cooperation between parties with different responsibilities and different positions related to the teaching professions. Equality in this context means that the parties have the same value for the objective of developing mentoring and mentor networks. This implies an expectation that one part cannot take over responsibility for another. For example, it is the owner who will design and operate mentoring programs for graduates, whilst the University College Østfold shall contribute to the quality of the mentor's work by offering mentoring education and professional development (Ministry of Education and KS 2009).

The project Mentoring Network Østfold works with four focuses as entrances into establishing a mentoring network. First, the national program Mentoring new teachers in kindergartens and schools, as mentioned above. Secondly, workshops, which will be discussed in more detail in this article. Furthermore, the project is run by a project steering committee representing various positions and competencies of the teaching profession. Finally, the last focus is on research and development work, which this article documents.

## Research question

On this basis, we find it interesting to focus on the following research question: How can multi-professional mentoring networks contribute to learning about mentoring?

In our phenomenological approach to the material, we found three categories that may be of interest to elucidate further when it comes to the importance multi-professional networks may have for learning about mentoring: motivation, relation and polyphony.

## Theoretical framework

The article is based on Bandura’s social cognitive learning theory, which claims that motivation has its origins in cognitive structures and is the main generator to human behavior and actions (Bandura 1986). Bandura combines individual learning and thinking with the human ability to interact with their social and cultural surroundings. Based on Bandura’s discussion of self-efficacy and the mutual interaction between the person, the person’s behavior and environment, we consider it relevant to bring in the relational term as found in Bateson’s (1972; 1978) communication theory. When discussing relations we will use the term context as human’s mental framework of understanding. In the discussion of polyphony and plurality, we let ourselves be inspired by Bakhtin (1981) and Biesta (2006). Bakhtin binds together the concepts of polyphony and dialogue through his understanding of dialogue as “keeping all differences together simultaneously.” Likewise, Biestas’ (2006) presentation and elaboration of the concepts of plurality, diversity and difference provides us with access to perspectives that we see as fruitful in our context. When discussing the findings, we will relate motivation to the seminars, relation to Gnav School and polyphony to both the seminars and Gnav school. This is related to what the material has revealed.

## Motivation

Motivation is related to the belief that we can master a task, which in turn affects the choice of strategy to solve it. Bandura (1994) argues that self-efficacy is the key to our motivation, and that we are motivated for different actions on the basis of past experience. It's about a cognitive evaluation of one’s own problem-solving capacity in the future, and the experience of having the skills required in a given situation. High self-efficacy is influenced by context and prior learning, and is of significance for behavior, mindset and motivation, which in turn contributes to greater persistence and intensity in facing new challenges.

According to Bandura (1997), self-efficacy is based on several factors. In our material we have findings that illustrate three of these; Mastery experience, Vicarious experience and Verbal persuasion.

### *Mastery experience*

Mastery experience is about personal experiences and is considered to be the main source of self-efficacy (Bandura 1997). When a person through internal cognitive thought processes has faith in himself and masters a particular task, it contributes to an increased effort to implement the action. At the same time this has a positive effect on the person’s self-image.

### *Vicarious experience*

Vicarious experience occurs in the person’s environment. Bandura (1997) argues that our expectations of mastery in various situations are shaped by other role models’ performances. Model learning takes place through observing and interacting with others who hold different forms of expertise. Through meeting with others and being inspired by others’ expertise, this can contribute to the belief and expectation that one can master a task oneself (Manger, Lillejord, Nordahl and Helland 2013).

### *Verbal persuasion*

Verbal persuasion is achieved through positive feedback from significant others (Bandura 1997). The fact that others believe in someone has a major impact on how a person thinks about her/himself. The experience of positive feedback from others can make a person put more effort into executing a task than if the person acts alone. In the meeting between colleagues in professional networks, dialogue and feedback strengthen each other’s know-how and expertise (ibid.).

### **Relations**

The relational perspective is central to Bateson’s (1972, 1978) communication theory. There is an understanding that in addition to deal with relationships between people, also deals with phenomena and events. A relationship is not observable, but we can get knowledge about the relation through man’s descriptions of their experiences of interaction. The descriptions represent the relation that makes up the entirety of the interaction. Human expressions and properties are not localized to the human alone, in addition it is also shown in the relation. Expressions and properties become a result of the relation. “If you want to talk about, say, “pride”, you must talk about two persons or two groups and what happens between them” (Bateson, 1979, 147). Context becomes a part of the relation and is described as a psychological frame of understanding that has significance for the individual opinion of phenomena, situations and actions. Context involves metamessages that represent the actions and expressions of the interaction, and it is the recipient of the message that creates the context (Watzlawick et al. 1967; Bateson 1972). For example, the message “The weather is nice” will have different meanings, and will only take on meaning when it is related to the context it is presented in. It is the context that classifies the message. “But to act or to be one end of a pattern of interaction is to propose the other end. The context is set for a certain class of response” (Bateson 1972, 275). The context concept can be useful if we want to examine the established perceptions of phenomena. By examining the psychological frame of understanding for a perception, an opportunity for new understanding will open. Our idea of what confronts us is, according to Bateson, not identical with the phenomena. All experience is subjective (Bateson 1972, 1979). Our understanding of a mentoring will according to this concept be answered with a variety of statements, depending of the recognition we have.

### **Polyphony**

Bahktin (1981) provides a detailed and fruitful understanding of the dialogic perspective in his presentation of polyphony. In our study we have found statements that we perceive can be categorized as polyphonic. Based on interpretation of Bahktin and Dysthe (1995) gives content to the concept of polyphony. Polyphony is characterized by many voices exist and co-exist simultaneously. The voices we hear represent different experiences, different opinions, different skills, etc. Bahktin (1981) attributes this to dialog and calls it mutuality and reciprocity of differences, meaning that the voices are in an interactive and dialogical relation to each other. According to Bahktin there is a learning potential in the polyphonic perspective. Once the voices are in a dialogic interaction with each other in the way they are set up against each other, contradict each other or are complementary, a conceptual change occurs (ibid.).

We see the concept of polyphony as closely related to the concepts of diversity and pluralism. Biesta (2006) also stresses the dialogic perspective implied as “to be able to build over the gorges between individuals.”. He has in his works on education discussed and argued the content of these concepts, and contributes other and more precise terms to give a fuller meaning. Plurality, according to Biesta, can be understood as variations of an identical background. He is concerned with the concept of diversity which puts greater emphasis on dissimilarity and otherness. A further clarification is introduced when he uses the concept of difference, which expresses the presence of high levels of diversity and otherness. An important point according to Biesta is how individuals “break into a world” of pluralism and diversity through the responsibility for someone else than ourselves.

## Research methodology

As a research strategy, we use Participatory Action Research. Participatory Action Research is an approach in which the basic principle is to generate complementary perspectives for changing discourses among participants. The research strategy represents an understanding that emphasizes participation, action and reflection. Scientists and involved participants follow a process over time and pay attention to both process and outcome. A key criterion is that all participants are included in the dialogue-based learning processes (Pålshaugen 1994). Another important criterion is that Participatory Action Research is applied from the start of the project, preferably in the initial phase.

According to Participatory Action Research, the transitions between the dialogue and evaluation and intervention can be diffuse. The intention is that the researcher shall hold a role as evaluator and dialogue partner. “The commitment of the trailing researcher is to contribute to the program’s learning: it is the management’s responsibility to carry any learning into practice” (Finne, Levin, and Nilssen 1995, 20). Pålshaugen argues that important tasks related to the evaluator’s role are to organize/build relevant dialogue arenas and direct dialogue processes (Pålshaugen 1994).

A fundamental characteristic of this research strategy is the formative aspect. The formative aspect enables learning- and development promoting dialogue between participants and researchers where they perceive themselves as active agents of change in their own workplaces.

We have had an essentially phenomenological approach to our material. By this we mean that we have searched for and identified units of meaning in texts, and then put these meaning units together in to overall meaningful categories (Giorgi 1997). We see a clear connection between the phenomenological approach and the participatory action research strategy. The strategy emphasizes a holistic approach and a mutual meaning process in the interaction between the sources and the fields examined (Boch Seegard 2007).

One of the methods we found fruitful was to examine logs written by participants. The logs are composed by two mentors at Gnav School. Log is a structured method for sorting and processing of experiences (Tveiten 2008) and can provide a comprehensive account of the phenomena described (Bjørndal 2013). The logs embrace a period from early to late autumn 2014.

In two of the seminars in 2013 we let the participants answer a few open questions. Asking open questions paves the way for a phenomenological approach (Kvale 1997). With open-ended questions, the participants are encouraged to comment on something he or she thinks is important or interesting.

## Findings

### *Motivation and self-efficacy*

#### *Mastery experience*

In the seminars, mastery experiences are expressed by the participants’ renewed faith in themselves and the desire to implement mentoring in their own workplaces. The seminars seem to strengthen the participants through making them feel safer in the mentor role and their mentoring skills. One mentor says: “That I get to refresh my skills ...”. Bandura argues that a person’s belief in having the capabilities needed to deal with future challenges will determine the degree of motivation for the activity (Bandura 1997). Several participants also expressed their wish to clarify mentoring to a greater extent and to contribute to put it on the agenda at their respective workplaces. One mentor expresses: “I feel I am left with a lot of exciting information and new ideas that I want to pass on to my kindergarten.”. Statements from the seminars also show that the motivation for developing their own workplaces concerning mentoring is present. According to a mentor: “The content has given me an interest in mentoring as a good method for working with development and competency development in a personnel group.”. Bandura (1997) associates the term “human agency” to people who are referred to as proactive, self-regulating and reflective, and who are people with faith in themselves. Skaalvik and Skaalvik call these people “agents in their

own lives”. Being agents in their own lives means amongst other things that one is determined, evaluate their competencies and work strategically and holistic with the task (Skaalvik and Skaalvik 2012). Bandura (1997) argues that motivation for development is created through self-efficacy and autonomy. Goddard (2001) emphasizes the collective expectation of mastery as a condition for development. When we believe in ourselves and believe that we can master a particular task, we put more energy and effort in the implementation, which in turn strengthens our self-perception. Statements from the seminars indicate that participants are strengthened in the belief in their own capacity and motivation to apply mentoring as a system in their own workplaces. The seminars also contribute to the forming of opinions and development of the participant’s subjective context understanding.

#### *Vicarious experience*

In Bandura’s understanding of vicarious experience, the observation of achievements of others is central. Observing others mastering a task can increase the belief in oneself mastering the task (Bandura 1965). As seminars only to a limited extent invite to observation, vicarious experiences in our material is about exchanging experiences about mentoring between professionals. In the material we see that the seminar participants find it motivating to be connected to a multi-professional network where they get an insight into each other’s everyday life and have the opportunity to make contacts across workplaces and professions. A mentor puts it like this: “A forum for exchange of views and insight into how other workplaces conduct mentoring”. Some statements are also about the experience of self-mastery when meeting others. “It’s important for me to meet others in order to develop myself.”. In addition, several express that they find it motivating to meet other mentors so that they can benefit from each other. “The seminars provide motivation and commitment, and sharing experiences makes sense.”. It also appears from the material that establishing local networks in their local communities is desired. “Can get useful advice, reflections that can be passed on to my own practice and further networking.”. By demonstrating mentoring through vicarious experiences and model learning in networks, strengthened self-efficacy could lead to the implementation of mentoring. In this way it becomes a natural part of the daily work in meetings between professionals.

#### *Verbal persuasion*

Verbal persuasion addresses the importance of providing positive feedback to others, and how this can contribute to provide greater self-efficacy. This means that significant others express an expectation to a person’s ability to master a task (Bandura 1997). Our findings indicate the participants’ satisfaction with taking part in discussions and sharing experiences together. “We who are present here need to bring “home” what is said and experienced here.”. This is consistent with Bandura who claims that positive verbal feedback from others contributes to a conviction about their skills and capabilities, and enhanced self-efficacy (Bandura 1997). Other statements show that the feedback is perceived as supportive and affirmative, and also contributes to a broader understanding of mentoring. “Good discussions between different kindergartens that gave many suggestions and different perspectives.”. Most of the seminar participants are employees in kindergartens and schools, and they are qualified mentors. Many express that mentoring in the professional field primarily is focused on mentoring students and/or graduate teachers, which they also perceive as legitimate. This often implies an everyday professional existence where professional carry out mentoring when they have graduates at the workplace for a specific period of practice for students. These tasks are time-limited, which often means that mentors for long periods of time do not get to practice mentoring or keep up their competence. As the statements point out, the seminars open up for a broader understanding of mentoring, focusing on mentoring as a method for competence development of colleagues as well as developing the quality of their own workplaces. Many mentors perceive this as a much larger task representing many barriers in order to get it implemented. Bandura (1997) sees it in connection with low self-efficacy, where one chooses to avoid specific tasks. Verbal persuasion is therefore particularly effective when



professionals doubt whether they can master a task. Through other’s verbal persuasion and support the seminars can, in the meeting between the practitioners, strengthen each others self-efficacy, which in turn helps to make it easier to take on challenging tasks.

## ***Relations***

### *Awareness and change*

In the mentoring sessions at Gnav School, we listen to the mentor’s descriptions of events and statements. The descriptions represent amongst other topics relations that are established in mentoring. One mentor says the following about a mentoring session: “Many asked good, open questions to the mentoree, who in turn responded in an elaborate and good fashion.”. The mentor’s open questions represent a relation of wonder and willingness to face the unexpected. The open query form is supportive in character, but it can also be challenging seen from the mentoree’s perspective (Lauvås and Handal 2014). In this lies a potential for change. A relation characterized by curiosity which contributes to reflection in the mentoree can be characterized through participation and the attentive presence. Participation is about the willingness to become involved in the other’s world of experience, and to be present both in one self, for the other individuals involved and in the processes created in the relation (Karlsen 2011). In descriptions given after the mentor session described in the above statement, the mentor says: “The mentoree stated that he had been thinking about giving up spesific method of teaching, but he has now found new courage to continue.”. Learning and change are considered by Bateson (1972) as a relational phenomenon. It is the relationship that initiates learning, either between people or between people and their encounter with knowledge. Related to Bateson, the statement above is an indication that mentoring causes a changed psychological frame of understanding in the mentoree. The context described in the quotations above is the basis for the individual work in the classroom and suggests an altered perception of the issue that was the basis for the mentoring.

### *Diversity and context*

The mentors’ descriptions in the logs indicate that the participants’ experience of mentoring were expressed differently. One of the logs states: “I felt that not everyone was equally enthusiastic about participating in mentoring.”. This statement may indicate that the participants have different psychological frames of understanding for mentoring. According to Bateson (1972), human beings establish a psychological frame of understanding for phenomena in order to make sense. At the same time the context is alterable in the way that new information provides new or expanded context. One mentor says: “I started to say something about mentoring often being associated with giving and receiving advice, while professional educational mentoring aims to create reflection that leads to development and change.”. The mentor provides information about what mentoring might be about. The statement becomes what Bateson (1972) calls a context marker, a signal of how the situation should be understood. Even though such frameworks are clarified, it will according to Bateson (ibid) still occur different interpretations and understandings of phenomena, events and actions. Linked to our context, the psychological framework of understanding for mentoring will be diverse and provide different meaning for each participant. Many people associate mentoring with the mentoring of students or graduates who can be seen as dependent on help in performing the profession. From this perspective, it can be difficult for a competent practitioner to understand the importance of mentoring for themselves. Still, we see that the project at Gnav School has initiated processes that show that the participants have strengthened their faith in mentoring through experience. One mentor describes: “The next day, another colleague came to me and expressed enthusiasm about mentoring. She clearly saw the transfer value related to challenges in her own class, and thought it was super that we could spend time on this. ““It’s the core of what we do” she said.”. Such statements represent an attitude that suggests that participants’ psychological frame of understanding for mentoring is conducive to relations characterized by enthusiasm and motivation for mentoring.

## *Polyphony*

The material from the seminars is characterized by a form of diversity that tends to be less problematizing and more uniform (Tolo 2014). The findings provide room and space for many voices, but the voices are highly coherent, simultaneous and mutually complementary (Bahktin in Dysthe 1995). In contrast to the findings in the seminars, the findings at Gnav School to a greater extent also expressed tensions, differences and contradictions. In addition, we can consider logs from Gnav School as a form of narratives, which are different from the actions described; “Narratives reflect experience (as per Dewey), narratives are sense-making tools, and recounting narratives involves reconstructing the experience” (Stuart 2012, 441). In this way, the logs become experiential narratives as double constructions of events and actions. The narrative perspective opens up to an awareness of the multi-voiced when we look at the logs as narratives. These provide room for the voices of the two mentors and the voices of mentorees in a mentoring group as they are rendered by the mentors as authors of the logs. According to Bahktin (1981), both the above mentioned forms of assembly of voices lead to conceptual change. Findings and discussions of findings mainly focus their attention to the “visiting” and listening, power and asymmetry and that polyphony also has a time aspect.

### *Visiting and listening*

The participants at the seminars are, naturally, occupied with professional mentoring themes. Similarly, the logs from Gnav School are centered on narratives linked directly to mentoring. The statements of the seminars are of a relatively general nature; “We are made aware of each other's expertise, we develop mentoring skills across professional groups.” Exactly what caused “opening our eyes for each other’s expertise,” or how “mentoring expertise is developed across professions” we do not get to know. However, we assume that the dialogic processes are a condition for mentoring expertise to be shared and developed. Central to the dialogue are the abilities to listen. In the logs we “hear” voices taken from mentoring sessions that elaborate and give meaning to the concept of listening when we understand mentoring as dialogue. “The next day, another colleague came to me and expressed enthusiasm about mentoring. She clearly saw the transfer value related to challenges in her own class, and thought it was super that we could spend time on this”, and in another log we read: “The third teacher in the class was also very involved, and these three teachers eventually came to an agreement that everyone should try to implement the advice that worked so well for one.”. To arrive at such knowledge related to teaching presupposes that they really have listened to the mentoring sessions they’ve participated in. They recognize that another teacher has seen something they have not seen. Biesta (2006), when clarifying the concept of pluralism, has looked to Disch (1994) and introduces the concept of visiting which entails “Visiting is therefore not to see through the eyes of someone else, but to see with your own eyes from a position that is not your own - or to be more precise, in a story different from one’s own” (Biesta 2006, 91). Visiting is connected to listening. Greene (2005) refers to Hannah Arendt, who is concerned that listening must be viewed in the context of visiting; “Visiting involves carefully listening to the perspectives of others because the more people’s standpoints I have present in my mind while I am pondering a given issue... the better I can judge” (Arendt 1968, 241, in Greene 2005, 16). The teachers who give voices to the logs appear to have listened and been inspired to try out the principles of a teaching program through “visiting” a colleague in a mentoring session. In addition, the teachers show a capacity for self-appraisal through their statements, as Anne Lise Løvlie Schibbye defines as our ability to distinguish between our own and others’ experiences, views or representations (Løvlie Schibbye 2004).

### *Power and asymmetry*

Mentor relations are characterized by power and asymmetry (Kristiansen and Mathisen 2005). The asymmetry is closely related to the mentor’s knowledge and skills, and allows mentors to make judgments that mentorees cannot make because they do not possess this expertise. Løgstrup (1975) points out that the mentoree exposes herself in interaction and dialogue with

others, and this demands safeguarding. The mentor needs to balance his power and his standpoint in order to support the mentorees in a way that contributes to learning and development for the mentorees. It is not interesting to observe if power is exercised in the mentor relation, but how power is exercised and experienced (Allgood and Kvalsund 2003).

We sense that both mentors at Gnav School feel uncomfortable with using the power they actually have. One gives voice to the statement; “I see in retrospect that I possibly could have controlled this somewhat firmer than I did. There and then I thought that if I stop them, they may not contribute further to the mentor sessions.”. The other mentor states; “... I felt that during the rounds of questions, some of the mentors were prone to embedding advice in the questions. I can point out separating questions and advice a little clearer in the next round.”. If the mentors’ voices become too vague during the mentoring session, this can lead to uncertainty in the relationship between mentors and mentorees. The asymmetry cannot be removed or repealed. This makes the mentor relation risky, and can result in those involved being less visible to each other and becoming unsure of whether they understand each other (Kristiansen and Mathisen 2005).

### *The polyphony and time*

A way to understand the polyphony which we observe in our data is that the same voices change with time. In addition to the exterior, immediately observable, like how the latest logs describe new phenomena and events, the few texts that have been available seem to have changed character from being relatively descriptive and sober to move towards more detailed and “writing for thinking” (Dysthe 1995, 86). The statements in the first two logs contain many statements that are not heavily influenced by reflection: “The mentoree thinks it would be a good experience.”. This statement is attributed to a group mentor conversation without any subsequent considerations as to why the mentoree thought “it had been a good experience.”. One of the later logs contains statements that are of a different nature; “The other mentoree had worked with the advice he had received and experienced a positive change.”. And again, a bit further down in the same log; “The mentoring we had was probably characterized more by the support group method, which aims to ensure that everyone contributes to the focus person being able to assess and reflect. In my opinion, it was exactly this that came out of the mentoring session.”.

## **Conclusions and implications for teacher education**

Findings and our discussion of findings divided into the three categories of motivation, relations and polyphony open up to conclude that multi-professional networks provide many contributions to learning and development about mentoring, both individually and collectively. Participants in the seminars link learning and development to collective processes like being associated with a multi-professional mentoring network, to benefit from each other, coping when facing others, individual mastering when interacting with others and to be confident about their skills in interaction with others. In our discussion of the findings at Gnav school linked to the concept of relations, we show that the open query form in the mentoring sessions gives room for reflection and a sense of presence, that relations that have arisen during the mentoring leads to change and learning, and that the frame for understanding peer mentoring leads to relations characterized by enthusiasm. At Gnav School, learning and development is associated with visiting and listening skills, the conceptual pair power and asymmetry, and that voices change with time.

The closeness to practice and reality that characterizes both seminars and mentor sessions at Gnav School suggests why learning and development of mentoring takes place. Cervero (1988, 1992) brings together mentoring and workplace learning when he states; “Valuable models of continuing professional education includes opportunities for participants to learn from and in their everyday work practice, situating their knowledge out of the tools, contexts, experiences and feedback in their everyday work place environment.” (Cervero in Hansman 2002, 7).

Other key characteristics we can associate to seminars and Gnav school is a strive for equality, dialogue and interaction. Buck endorses such an approach when she writes about mentoring as a strategy for creating learning organizations: “The dimensions of a learning

organization ... are apt to be enhanced through mentoring programs that are dialogic, horizontal, and collaborative in nature” (Buck 2004, 11).

Our findings and the research we have used to illustrate findings suggest that multi-professional mentor networks are suitable tools for sharing knowledge and experiences that contribute to learning and development in professions.

## References

- Allgood, E. and R, Kvalsund. 2004. *Learning and discovery - for professional educators*. Tapi academic press.
- Bahktin, M. 1981. *The dialogic imagination*. Austin TX: University of Texas Press.
- Bandura, A. 1965. “Influence of model’s reinforcement contingencies on the acquisition of imitated responses.” *Journal of Personality and Social Psychology*: 589-595.
- Bandura, A. 1986. *Social foundations of thought and action: a social cognitive theory*. Englewood Cliffs, N.J.: Prentice Hall.
- Bandura, A. 1994. “Self-efficacy.” In *Encyclopedia of human behaviour*, edited by V. Ramachaudran, vol. 4, 71-81. New York: Academic Press.
- Bandura A. 1997. *Self-efficacy, the exercise of control*. New York: Freeman & Company.
- Biesta, G. 2006. *Beyond learning. Democratic education for a human future*. USA: Paradigm Publishers.
- Biesta, G. 2006. *Bortom lärandet. Demokratisk utbildning för en mänsklig framtid*. Studentlitteratur AB: Lund.
- Bjerkholt, E. and T. Karlsen. 2003. *Delrapport 1 - veiledning av nyutdannede lærere i barnehage og skole*. Notodden: Høgskolen i Telemark.
- Bjørndal, C. 2002. *Det vurderende øye*. Oslo: Gyldendal Akademisk.
- Boch Seegard, S. 2007. *Refleksivitet i følgeforskning. Strategi, roller og utfordringer*, Fagkonferansen Trondheim.
- Buck, M. 2004. “Mentoring: a promising strategy for creating and sustaining a learning organization.” *Adult learning June*, 15.
- Disch, L. (1994). *Hannah Arendt and the limits of philosophy. With a new preface*. Ithaca: Cornell University Press.
- Dysthe, O. 1995. *Det flerstemmige klasserom*. Ad Notam Gyldendal. Oslo.
- Finne, H., M. Levin, and T. Nilssen, T. 1995. “Trailing research.” *Evaluation 1* (1): 11-31
- Geertz, C. (1973). “Thick description: towards an interpretive theory of culture.” In *The interpretation of cultures: selected essays*, edited by C. Geertz, 3-32. New York: Basic Books.
- Giorgi, A. 1997. “The theory, practice, and evaluation of the phenomenological method press as a qualitative research procedure.” *Journal of Phenomenological Psychology 28* (2): 235-60.
- Goddard, R. 2001. “Collective efficacy: a neglected construct in the study of schools and student achievement.” *Journal of Educational Psychology 93*: 467- 476.
- Hansman, C. 2001. “Mentoring as continuing professional education.” *Adult learning 12*.
- Karlsen, T. 2011. “Forhold av betydning for veileders delaktighet i veiledning.” In *Veiledning under nye vilkår. Skapende prosesser i møtet mellom veileder og veisøker*, edited by T. Karlsen, 19-32. Oslo: Bokmål.
- Kunnskapsdepartementet 2003. St.meld. nr. 30 (2003-2004). *Kultur for læring*. Oslo: Dept.
- Kunnskapsdepartementet 2006. St.meld. nr. 16 (2006-2007) ... og ingen sto igjen. Oslo: Dept.
- Kunnskapsdepartementet and KS. 2009. *Avtale mellom Kunnskapsdepartementet og KS om veiledning av nytilsatte, nyutdannede pedagoger i barnehage og skole*. Oslo: Dept.
- Kunnskapsdepartementet 2013. Meld. St. 20, (2013-2014) *På rett vei. Kvalitet og mangfold i*

*fellesskolen*. Oslo: Dept.

Lauås, P., and G. Handal. 2014. *Veiledning og praktisk yrkesteori*. Cappelen Damm Akademisk, Oslo.

Manger, T., S. Lillejord, T. Nordahl, and T. og Helland. 2013. *Livet i skolen 1. Grunnbok i pedagogikk og elevkunnskap*. Bergen: Fagbokforlaget.

Pålshaugen, Ø. 1994. *A Norwegian programme of action research for participative democracy*. Oslo: Arbeidsforskningsinstituttet.

Kristiansen, A., and P. Mathisen. 2005. "Etiske retningslinjer i profesjonelle veiledningsforhold." *Norsk pedagogisk Tidsskrift* 3: 221 - 230.

Kvale, S. 1997. *Interview. En introduktion til det kvalitative forskningsinterview*. Hans Reitzels Forlag. København.

Løgstrup, K. 1975. *Den etiske fordring*. København: Gyldendal.

Løvlie Schibbye, A. 2002. *En dialektisk relasjonsforståelse. I psykoterapi med individ, par og familie*. Oslo: Universitetsforlaget.

Pålshaugen, Ø. 1994. *A Norwegian programme of action research for participative democracy*. Oslo: Arbeidsforskningsinstituttet.

Tveiten, S. 2008. *Veiledning - mer enn ord*. Oslo: Fagbokforlaget.

Tolo, A. 2014. *Kompetanse for mangfold: om utdanningens rolle og skolens utfordringer i det flerkulturelle Norge*. Bergen: Fagbokforlaget.

Skaalvik, S., and E. Skaalvik. 2012. *Skolen som arbeidsplass. Trivsel, mestring og utfordringer*. Oslo: Universitetsforlaget.

[Back to contents](#)

## The changing role of deans in higher education: from leader to manager

*Eystein Arntzen*

*University College of Østfold, Norway*

eystein.arntzen@hiof.no

### Abstract

During the latter decades new perspectives on academic leadership have emerged along with new ways of organizing the decision making structure. The image of academic leader as manager has slowly but steadily been diffused internationally. In addition to the structural changes in the system of higher education the idea of new public management has changed the way academic work is supposed to be managed, in favour of enhanced managerial control and high demands on academic staff. It is reasonable to assume that these changes within the higher educational institutions, along with changes in the relationship between the government and the higher educational institutions, has led to changes in the role of the leaders, both referring to the tasks leaders are supposed to solve and which responsibility and authority they have. In this paper I study how the role of deans in teacher education is influenced by those changes.

**Keywords:** role of deans; organizational changes; leadership; management.

### Context of the research

Higher education institutions have a long history, and are of central importance in economic, social and cultural development for countries everywhere. Throughout time, academic institutions have sought to respond to the demands of changing and evolving environmental conditions of society. On the other hand they have also been among the most stable institutions during the past centuries.

Higher education has a long tradition in emphasizing academic leadership. The influence of the distinguished professor was for a long time perhaps the most important characteristic of the European higher education system. While it is recognized that higher educational institutions are historically collegial organizations, it is also recognized that the collegial system needs to support accountability and institutional responsibility, or even be more managerial in order to face the challenges of the future.

During the latter decades, new perspectives on academic leadership have emerged along with new ways of organizing the decision making structure in higher education institutions. Thus, images of academic leaders as coordinators, coalition builders, or entrepreneurs have slowly but steadily been diffused internationally, and has had a wide impact on higher education. These new images of academic leaders have been supported by a new set of ideas on how the sector should be organized and led (Askling and Stensaker 2002).

In addition to the structural changes in the system of higher education the idea of new public management has changed the way academic work is supposed to be managed, in favour of enhanced managerial control and high demands on academic staff. New public management emphasizes that leadership is vital in achieving organizational objectives and promoting organizational change. The normative elements in the new public management rhetoric are quite strong, emphasizing ideals rather than realities, simplicity rather than complexity, and unambiguous solutions rather than paradoxical ones.

It is reasonable to assume that these changes within the higher educational institutions, along with changes in the relationship between the government and the higher educational institutions, has led to changes in the roles of the leaders within the institutions, both referring to what kind of tasks leaders are supposed to solve and which responsibility and authority they have.

## Research aims

Decentralization and delegation of responsibility from public authorities to higher education institutions, and from institutions to faculties and basic units are important elements in this development. However placing new responsibilities on lower levels in the education system increases the pressure on the academic leaders on these levels (Aasen and Stensaker 2007).

In short, it would be interesting to see how the role of deans has been influenced by these developments, and how the deans experience the changes of role.

## Theoretical framework

### *Theories of leadership and management*

In research literature there are mainly two different views on leadership: Leadership could be conceived as the individualistic qualities of a person or as organizational function as a response to external or internal challenges within particular frameworks of history and social structure.

The idea that leadership is based on individual attributes is known as trait theory and goes back to antiquity when Plato in *The Republic* and Plutarch in his *Lives* discussed the attributes of leaders. The main question for this sort of theory is “What qualities distinguish an individual as a leader?”. In this theory leaders are mainly individuals who are born leaders or develop leader qualities in early childhood. According to these theories a good leader can lead anything. To educate leaders seems a bit paradoxical from this perspective.

Later leadership theories see leadership more as a relation between an individual or group of individuals and their surroundings. There is often a distinction between contingency theories and functional theories. Situation, context and function are central concepts in these sort of theories. According to these theories leadership can be learned and developed, but a good leader in one context is not necessarily a good leader in another. The focus is on explaining leadership behaviour. What leaders actually do is to a large degree dependent upon characteristics of the situation in which they function. Leadership is a complex process consumed by complications of timing, circumstances and individuals. Thus, a simple formula for leadership does not and will probably never exist.

The time spectrum shows a theoretical evolution that advanced from trait theories to behavioural theories, followed by contingency theories to transformation and transactional theories. Today we will often find a mixture of these theories when leaders and leadership are discussed (Aasen and Stensaker 2007; Bargh et al. 2000).

It has been fashionable to distinguish leaders from managers. It can be said that one does the right things; the other does the things right (Zaleznik 2004). There is little disagreement that leadership is a process for influencing decisions and guiding people, whereas management involves the implementation and administration of institutional decisions and policies. Management is a relatively structured process for achieving organizational objectives. Leadership is more often viewed as an interpersonal process for establishing objectives, inspiring and motivating followers. However, a meaningful understanding of both concepts can only be reached when they are examined in relation to one another. Management reacts, while leadership transforms (Neumann and Neumann 2000; Taylor and Machado 2006).

The manager can never be free to forget the work; can never have the pleasure knowing, even temporarily, that there is nothing left to do (Mintzberg 2009). The pressures of the managerial environment do not encourage the development of reflective planners. The manager does not leave the telephone, the meeting, or the e-mail to get back to work. These contacts are their work. On the other side, according to Waldrop the adaptive institution must live on the edge of chaos. This creates a delicate balance between stability and instability that must be orchestrated by strong leadership (Waldrop 1993).

According to Henry Mintzberg it is agreed that managing is controlling and doing and dealing and thinking and leading and deciding and more, not added up but blended together. Leaders cannot simply delegate management; instead of distinguishing managers from leaders, we

should be seeing managers as leaders, and leadership as management practiced well. Leadership is earned, not anointed. Leadership and management is neither a science nor a profession; it is practice, learned primarily through experience, and rooted in context.

To him managing is about a person performing on three levels, from conceptual to concrete: with information, through people and to direct action (Figure 1).

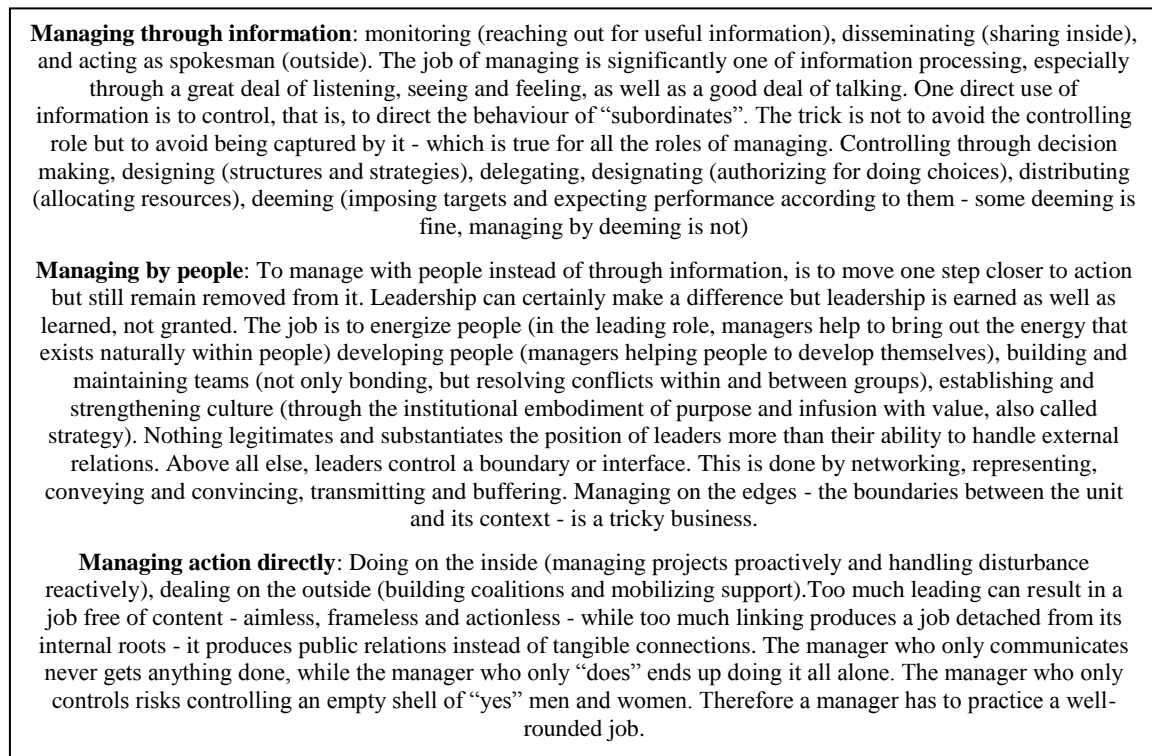


Figure 1. Levels of managing

The pressures of the managerial environment do not encourage the development of reflective planners. The manager does not leave the telephone, the meeting, or the e-mail to get back to work. These contacts are their work. On the other side, according to Waldrop the adaptive institution must live on the edge of chaos. This creates a delicate balance between stability and instability that must be orchestrated by strong leadership (Waldrop 1993).

Management and leadership are as much about lateral relationships among colleagues and associates as it is about hierarchical relationships. A good part of the work involves doing what specialists do, but in particular ways that make use of the manager’s special contacts, status and information. The leader has to help bringing out the best in other people, so they can know better, decide better and act better.

Strategic planning can play a role such as providing analysis to managers, helping translate intended strategies into realized ones, and providing a control device, but that is not necessarily effective for the development of strategy. One can view strategic management from positive as well as negative perspectives. It serves as a mechanism to provide direction to an institution and at the same time it has the potential to propel the institution on a perilous course (Mintzberg 1994; Mintzberg et al. 1998).

The role of deans implies both leadership and management; however, the focus has changed from leadership to management during the last years.

### *Deanship and academic leadership*

There is no such thing as a standardized dean. The concept dean is used differently in countries throughout the world and even varies between institutions in the same country. However



an academic dean is a leader and manager of an organizational entity in higher education institutions.

Leadership in such institutions has changed over time. Historically the role of academic deans emerged when presidents or rectors needed an individual to relieve them of duties. The dean’s primary role was to maintain collegiate and human values in an atmosphere of increasing scholarship and specialization. The typical dean was the elected professor. Today deans are more often appointed, externally recruited or even hired for fixed periods than elected (Rudolph 1990; Gould 1964). The responsibility of deans can be categorized in four areas (Figure 2).

- Professional and strategic responsibility. Deans have superior professional and strategic responsibility; it includes responsibility for developing goals and strategies for education, research and communication, and responsibility for quality control and development.
- Economic and administrative responsibility. This includes budgeting, fundraising, controlling income, spending and managing resources according to laws and regulations.
- Personnel responsibility. This includes human resource management and development. The dean has to see to that the unit has the right human resources and competences to meet the demands and strategic goals. The dean should also prepare for good work conditions and is responsible for managing human resources according to law and regulations.
- Internal and external cooperation. Deans should attend to the interest of their units and stimulate for internal cooperation included cooperation with students and other departments. Deans should develop a good organizational culture, and represent their units in relation to private sector, public sector and general public. In addition they are responsible for international relations. Last but not least the deans are members of the leader team.

Figure 2. Areas of deans’ responsibility

While the deans may still have kept some of the humanist ideals of the past, the academic dean of today is viewed quite differently. The deans’ duties have changed from being almost exclusively staff, student and curricula oriented to include a multifaceted array of activities, such as budgeting and fundraising, personnel and work environment.

While the deans may still have kept some of the humanist ideals of the past, the academic dean of today is viewed quite differently. The deans’ duties have changed from being almost exclusively staff, student and curricula oriented to include a multifaceted array of activities, such as budgeting and fundraising, personnel and environment management, program oversight and external public relations. As a result of legal and organizational changes, their positions got “enriched” with administrative duties while, at the same time, the former idea of a dean representing the academic staff on a collegial basis has declined more and more. The collegial role is crumbling while the managerial role takes over. Moving from an elected dean with collegial expectancies and academic internal standards to an employed dean representing the employer with managerial expectancies and external defined standards, implies challenges and conflicts.

The collegial role is crumbling while the managerial role takes over. Moving from an elected dean with collegial expectancies and academic internal standards to an employed dean representing the employer with managerial role expectancies and external defined standards implies challenges and conflicts. These areas of responsibility can be illustrated by differentiating the leader role. In his work Henry Mintzberg (1980) distinguishes between three basic types of leader/manager activities represented by 10 observable partial roles.

Deans need to offer service, be accountable, fulfil a moral role, act as a steward, build diverse communities with trust and collaboration and promote excellence. Expertise with budgetary matters is extremely important and experience in administration and supervisory skills are essential since deans are the individuals that hire and evaluate the academic staff (Wolverton et al. 2001; Robillard 2000; DiFronzo 2002).

Within this framework the tasks of deans can be interpreted as being that of functional leaders. Their role provides them with executive powers to manage personnel as well as material resources, and their strategic competencies can be seen as the formal equivalent to developing solutions to problems. Therefore deans have to assume managerial and entrepreneurial tasks; on the

other hand they must be careful not to violate the academic values which connect them with their peers. Goal setting is the main task of a functional leader. Acceptance of goal is central to goal attainment. Only when goal acceptance is high is the energy to reach goal activated. Anyway with respect to goal setting theory, acceptance of goals by those who will have to act up to them is crucial for successful implementation of change (Locke and Latham 2002, 2006).

One of the most demanding aspects of academic leadership in the current climate is the ability to respond productively to the myriad ongoing changes that characterize modern universities. However, deans cannot know everything. Some of the best skills a dean can possess are the constant thirst for knowledge, commitment to lifelong learning, and the courage to embrace the ever-evolving world of higher education. Along with exercising the necessary skills to meet the challenges of the position, the dean of an institution must always assume a leadership position. The dean needs always to be thinking ahead to the future while dealing with the present. Efficient and knowledgeable management is of considerable importance to any departmental entity, but under effective leadership much of it should be delegated to well-informed non-academic administrators.

Jones (2011) argues that the role of academic leaders is a role of crucial importance within the maelstrom that is today's academic environment. This argument holds regardless of the administrative structure found within any particular institution and regardless of whether the model of operation is a chair model or a faculty-college model. Heads of academic units are academic leaders whatever level they are occupying within the academic hierarchy, and regardless of whether they are appointed from inside or outside the university, until retirement or on a rotational basis for a defined period of time.

In the institutions of higher education, deans provide the delicate but crucial backbone of university decision making. They link central administration with academic departments. On the one hand, they serve as extensions of the presidency; on the other, they are regarded as extensions of the academic staff. Deans walk a delicate administrative tightrope. They head professional bureaucracies within professional bureaucracies. As deans within a university, they have legitimate authority, but within their faculty such direct power can rarely be exercised. Here, the dean often functions as a disciplinary expert, who happens to be carrying out administrative tasks. (Wolverton et al. 1999).

Deans are caught between the expectations of their colleagues and those of the central administration. Each group, because its success depends on the dean's performance, develops beliefs about what deans should and should not do. These expectations shape perceptions and understandings of the roles in which deans engage. In other words, the role of dean, and how it gets enacted, is influenced by social norms, by the perceptions of those who interact with deans, and by personal abilities. Through such interactions, deans create meaning that determines their behaviour in given situations. As administrators in hierarchical settings, deans behave in ways that seems situational appropriate to them, given the demands and expectations of those with whom they work.

When expectations of the university run counter to those of the academic staff, or when expectations of either entity remain ill defined, deans who attempt to meet these expectations experience a certain amount of conflict.

One function of good academic leadership is to make staff aware of the consequences of government policy for the university sector as a whole and their own university and faculty in particular. In order to do this the deans must have an understanding of the wider environment within which they are all functioning, and the implications of this for faculty dynamics. Time spent on jobs outside academia can have a positive effect on a dean accepting the strategic goals set by others.

## **Research methodology**

The empirical analysis is based on three main sources:

- a review of articles and reports. This usually implies selection problems. However, since my study is concentrated on Norway and Scandinavia from recent years, there is not much to select from. The material is therefore more or less representative;

- my personal experiences. Taken isolated the main methodological problem with those data is reliability. However those data are compared with other sources;
- survey data. The problem here is low response rate. Isolated these data are not valid, but seen in connection with the other sources they give an important insight.

## **Findings**

### ***Review of research studies***

In a study at Lund University (2009) most deans find that their tasks were adequate and sufficiently clear defined, but that frequent organizational changes kept creating uncertainties. Many deans argued that it was important that the dean had the possibility to participate in core activities such as teaching and research.

Many deans found that introduction of ICT (administrative systems) reduced their role as leaders and that they more and more were serving electronically based systems. In their opinion deans were at risk of being so event-driven that it was no longer room for strategic work.

Some deans were sceptical to big leader-teams. Their argument was that the bigger teams the more likely it was that they were reduced to alibies for already made decisions. Some deans stated that they experienced conflict in their roles between expectations from board and rectorate on one side and colleagues on the other.

The majority of deans had the opinion that research activities do not create good leaders and that it is a lack of rewards and incentives for leaders in higher education. However for most the greatest problem was lack of adequate administrative support.

In a study from Norway (Aasen and Stensaker 2007) found that academic leaders participating in leadership training program was generally positive. However, this seems not to indicate a managerial view of leadership. One of the most profound effects of leadership training program was that the participants had established a stronger identity as a “leader”. Participant’s definition of leadership after completion of the program was one that was closely associated with developing visions and strategies for the organization. Academic merits were still viewed as important, but not as a sufficient foundation for forward-looking institutional leadership.

Stress and lack of time was the dominant factor limiting participants’ ability to implement what they learned at the program. It was a mismatch between leadership expectations and organizational characteristics. The rather high expectations some of the leaders had after completion of the program seemed to have been quite rapidly brought down to ground when facing the organization afterwards. As such one could question the relevance of only training leaders when seeking to establish a more dynamic organization.

In a study from 2008 Arntzen and Aastveit found surprisingly big differences in how the deans experience the distribution of tasks connected to their roles. It seems to be a general tendency to value the role as “figurehead” and external relations together with dealing with transfer of information as being of less importance and extent than other tasks.

According to the study these differences could be explained in different ways. There might be genuine differences in tasks based on institutional or faculty situation. The differences might also be due to individual choices based on interest or competence or be a result of how leaders want to spend their time, more than how they actually act.

Two quite sustainable different types of leaders were identified one more managerial type of leader and the other a more entrepreneurial type of leader. The managerial type of leader focused mostly on managing personnel and conflict solving, while the entrepreneurial type of leader focused mostly on strategy, innovation and research.

On the positive side most of the respondents emphasized their opportunity to have real influence on the development of teacher education and considerable freedom to shape their own role as dean. Some of the respondents connected this to development of unitary leadership. In addition most respondents emphasized the importance of working with professional, positive and resourceful colleagues.

On the negative side the respondents most often mentioned high work load and stress often caused by lack of capacity and competence in administrative support. Problems were also connected to the fact that support and administrative systems were not adjusted according to development from divided to unitary leadership.

The most important measures suggested on national level were more explicit non contradictory priorities. An offer of formal managerial education or managerial development for leaders was also asked for. On the institutional level many mentioned the unreasonable budget model with lack of legitimacy which results in unpredictable outcomes and eternal fights for resources. Better administrative support and offering of managerial development was also mentioned frequently. On faculty level suggested measures were better and more extensive administrative support.

It seems that deans from university colleges and deans from universities had different preferences. Deans from universities were stressing formal education somewhat more often than deans from university colleges. When it came to what qualifications were most important for a leader of teacher education, it looks as if the answers are divided in two groups. On the one side were those who think experiences from school and teacher education were of crucial importance, on the other side were those who emphasise academic competence, preferably at PhD-level, as the most important.

Several respondents stressed experience as leader, and some that this experience has to be extensive since the job was very demanding. When it comes to personal characteristics there were no agreement, but decisiveness and ability to communicate and cooperate were mentioned most frequently.

### *Personal experiences*

When I was a student and later on lecturer at the university, the dean was a distinguished, elected professor. Deanship was taken on by turns between institutes of the faculty. Deanship was looked upon as a necessary burden by most of the professors even though most administration and managerial work was done on the institutional level.

When I started as a dean I had many years of experience as leader from both private enterprises and public services, first of all in the health sector. I was for the first time in the history of the University College an appointed, externally recruited dean at the faculty of teacher education. I was employed by the board with rector and the university college director as my prime superiorities, which sometimes was a bit confusing since the division of responsibility between them was not always clear. On the campus level my most significant relation was to the head of campus administration. At the faculty level my most significant relations were the board elected by the academic staff, later on also with external representatives from schools and pre-schools, and my heads of studies. Other important role partners were representatives of local unions and student association. However the relation to the academic collegium was in my opinion the most important, without their acceptance that means without legitimacy, I would not had accomplished much.

As a dean I was member of the institutional leader team, composed of the deans and led by rector. This team was meant to deal with strategic questions, which it sometimes did, but it also had to deal with a lot of day to day operational questions.

I came to a faculty that up to my arrival had had divided leadership with an elected dean and an externally recruited, appointed office manager. The faculty had its own administration lead by the office manager who was responsible to the administrative director. This was changed to a unified leadership. The main argument was to strengthen the academic leadership. However, the result was that the role of the dean was “enriched” with managerial and administrative tasks in a way that left less and less room for academic leadership.

Simultaneously, for the first time the institution had an appointed rector but still a divided leadership on top level. New public management was introduced with considerable force. During my time as a dean, I had three rectors of which two were elected, and three different directors.

The University College had three campuses when I started as dean. Soon a process started to reduce the number of campuses from three to two. At the same time my office manager retired and

local administrations were shut down and a new common administration established directly under the University College director. It did not work too well, and after a short period we ended up with a campus-based administrations led by a leader team composed of the campus deans and head of campus administration. In addition we had a central administration taking care of institutional matters.

Then started a process for merging three University Colleges which included a discussion of changing from enterprise organized activities to discipline organized. The process failed with the consequence of a new rector taking over and the start of a strategy process for a new, independent University College.

Through all these changes the organizing of teacher education was changed, with new studies, new curricula and new qualification requirements. Teacher education moved from a mainly experience based education to a mainly research based activity and the faculty started preparing for teacher education as a Master’s degree programme instead of a four year Bachelor’s degree programme. This meant new demands for qualification and new standards for recruitment. Personal management, specially recruitment and competence development, moved to be a dominant task. The change from a staff dominated by lecturers to a staff where more than 50% had their PhD and where a group of professors was established also changed the prerequisite for academic leadership.

The position of the dean was not remarkably changed during these processes. The dean was head of the teacher education faculty and member of the leader team all the time. The most significant relations, with rector, director and board were unchanged even though the persons changed. However the organizational changes were a challenge since the majority of the staff disagreed with the institutional leadership on the strategy for the University College. Due to externally introduced new goals for the teacher education conflict between traditional, collegial leader role and managerial leader role was increased and need for motivation and conflict solving developed fast.

The distribution and content of tasks changed considerably during these processes. First of all the institutional strategic processes were time-consuming at the expense of teacher education centred processes. Secondly the amount of administrative work increased dramatically due to changes in the administrative support and introduction of new public management.

My experience was that not two weeks were similar even though the general tasks were more or less the same. Mintzberg (2009) estimated that on average a manager is occupied about 50% of his or her time in meetings. By selecting three weeks at random I found that about 30% of my time was spend in external meetings with three or more persons, about 15% in internal meetings outside my faculty and about the same amount in internal meetings at the faculty. In addition at least one hour each day was spend on reading and managing e-mails or other ICT based systems. Together these activities constituted about 80% of my ordinary working time. There was no room for teaching or research activities and few possibilities for career improvement. However I had the opportunity to participate in a leadership training program for deans.

### ***Result of questionnaire send to deans of teacher education***

A questionnaire was send to more than 20 deans responsible for teacher education in Norway. This text is based on answers from eight of them. Even though this is a selected sample with the possibility of bias, I think the answers confirm other results and are quite illustrative for the actual situation.

All deans was appointed and externally recruited even though a couple had been elected deans earlier. All have experiences from leading positions in higher education either from higher education institutions or governmental bodies. The answer on who were their three most important role partners as deans, six answered the institutional leaders, their own leader team and their staff or representatives of the staff, only one mention representatives from school sector and one mention representatives for the owner (Government).

Three out of eight experience no or little role conflict, the rest experience conflict between representing their faculty and representing the whole institution or between expectancies from their staff and expectancies from their superiors.

Six out of eight thought development of strategies and plans were the most important task while one thought implementation of other’s strategies and plans were most important, and one that managing personnel was the most important. Six out of eight thought it was a good correspondence between what they thought most important and what task was most time consuming.

On the question: How do you experience to be part of a rapidly changing system influenced by international and national trends? Six out of eight deans answer that they found it both frustrating and problematic with low predictability and frequent changes, but they also saw the potential for change and development as positive, or as one formulated it:

“It is frustrating because it would have been possible to create better educations if the institution had more predictability and greater freedom. On the other side the ever changing environment creates possibilities for development and change.”.

One dean found it only challenging and positive, while another found it only frustrating and negative.

On the question: In your opinion what is the most attractive about being a dean? Seven out of eight answer that the most attractive about their job was the possibility to influence something that they found important, or as one formulated it: “The teacher profession is the most important profession in the world. To be able to manage and influence the development of teacher education is most rewarding.”.

On the question: If you were asked to suggest one initiative which could make the job as a dean more attractive, what would you suggest? Four out of eight mention more and better administrative support. Two deans mention better and more predictable institutional leadership and one mentions more influence on the strategic development of his institution.

## **Conclusions and implications for teacher education**

Higher education institutions are organized in different ways. Even though every institution is different in some details there are two main models which I would call the university college model and the university model. In the university college model the academic staff is organized in entities according to the profession they educate. These entities, called faculties or departments, have usually a unified leadership, and are led by a dean. Members of the staff represent different academic disciplines and can be organized in more or less formal groupings due to discipline. In the university model the academic staff is organized in institutes according to academic discipline. A number of institutes constitute a faculty led by a dean. In this model, economic and personnel responsibility is often delegated to the institutional level and responsibility for education of a profession i.e. teachers is often delegated to a program coordinator who is responsible for ordering relevant resources from different institutes. All together we may conclude that dean’s position and thereby role, differs dependent on organizational model. However, all deans are mid-level managers.

In a (surprisingly) short period of time the role of deans in higher education has changed from the elected, distinguished professor to an externally recruited manager. For a substantial part this change has been justified by arguments of quality and intent of strengthening the academic leadership. This change is concurrent with the introduction of new public management as a managing system. It indicates that the role of deans as an academic leader has been impaired at the expense of administrative and managerial tasks.

A dean has a crucial role linking central administration to academic activities in higher education institutions. If it is true as argued in this article, that it is not possible to be a good leader, at least over time, without taking care of managerial tasks, and that good management is dependent of the legitimacy of leadership, then this change is not without challenges.

Even though the role as leader and manager is intertwined it is also a source of conflict. Many deans experience conflict between being a manager implementing and administrating institutional and governmental decisions and policies, and being a leader with the possibility to influence the development of academic activities. This is in their opinion, partly due to inconsistent and ever changing framework conditions and indications. To do well the deans have to have the

opportunity to balance this conflict. However, the conflict is not necessarily something to avoid. Some deans think of conflicts as a source of creativity.

It is expected that deans are able to cope with all sort of managerial tasks including priorities, delegating and solving them within a limited space of time. Most deans think developing strategies and plans are the most important task, but how they allocate time and resources to tasks differ.

Most deans like and are enthusiastic about their job. The different sources of data seem to agree that it is important to deans to be able to influence the development of the education they are responsible for in a personal way. They like to think that their efforts “make a difference”. However, many deans feel their positions threaten by increased managerial and administrative tasks.

Most deans find their job rewarding because they are able to influence the development of teacher education which they find most important. However, there is not possible anymore to combine the dean’s role with academic activities as teaching and research, and experiences in teaching and research is not necessarily important for doing a deans job. Being a dean gives little credit to an academic career.

The changes in the role of deans probably means a professionalization of academic leadership which imply changes of criteria for recruitment, more and better supplementary education, and change of incentives. As the role of deans is being more and more management oriented it will probably require that moral and social incentives are compensated with economic incentives. However, the main incentive for doing good cognitive work are the feeling of autonomy, mastery and of making a contribution, or as Daniel Pink (2009) formulates it:

“Perhaps it’s time to toss the very word “management” into the linguistic ash heap alongside “icebox” and “horseless carriage”. This era doesn’t call for better management. It calls for a renaissance of self-direction... In our offices and our classrooms we have too much compliance and way too little engagement... It’s in our nature to seek purpose...”.

Even though incentives can be substituted, research seems to indicate that economic incentives cannot substitute moral and social incentives for this kind of work (Pink 2011). Therefore, the development presented here give reason to be worried about the future role of deans and deans’ work.

## References

- Aasen, P., and B. Stensaker. 2007. “Balancing trust and technocracy? Leadership training in higher education” *International Journal of Educational Management* 21 (5): 371-83.
- Arntzen, E., and K. Åstveidt. 2008. “The deans in Norwegian teacher education”. Paper presented at the ATEE Annual Conference 2008, August.
- Askling, B., and B. Stensaker. 2002. Academic leadership: prescriptions, practices and paradoxes. *Tertiary Education and Management* 8 (2): 113-125.
- Bargh, C., J. Boccock, P. Scott, and D. Smith. 2000. *University leadership: the role of the chief executive SHRE*. Buckingham: Open University Press.
- DiFronzo, C. 2002. *The academic dean Widener University*. <http://www.newfoundations.com/Org/Theory/DiFronzo721b.html>
- Gould, J. 1964. *The academic deanship*. NY: Teachers College Press.
- Jones, G. 2011. “Academic leadership and departmental headship in turbulent times.” *Tertiary Education and Management* 17 (4): 279-88.
- Lock, E., and G. Latham. 2002. “Building a practically useful theory of goal setting and task motivation. A 35-year odyssey.” *American Psychology* 57 (9).
- Lock, E., and G. Latham. 2006. “New directions in goal-setting theory”. *Current Directions in Psychological Science* 15 (5).
- Lund Universitet. 2009. Granskning av dekanrollen.
- Pink, D. 2009. *Drive. The surprising truth about what motivates us*. NY: Riverhead Hardcover.

- Mintzberg, H. 1980. *The nature of managerial work*. Englewood Cliffs: Prentice Hall.
- Mintzberg, H. 1994. *The rise and fall of strategic planning, plans, planners*. N.Y.: Free Press.
- Mintzberg, H. 1998. “Covert leadership: notes on managing professionals.” *Harvard Business Review* 76 (6): 140-47.
- Mintzberg, H. 2009. *Managing*. San Francisco: Prentice Hall.
- Neumann, Y., and E. Neumann. 2000. “The president and the college bottom line: the role of strategic leadership styles”. *Library Consortium Management* 2: 97-112.
- Robillard, D. 2000. “Toward a definition of deaning.” *New Directions for Community Colleges* 109: 3-8.
- Rudolph, F. 1990. *The American college and university. A history*. Athens, GA: University of Athens Press.
- Taylor, J., and M. Machado. 2006. “Higher education leadership and management: from conflict to interdependence through strategic planning.” *Tertiary Education and Management* 12: 137-60.
- Waldrop, M. 1993. *Complexity: the emerging science at the edge of order and chaos*. N.Y.: Simon and Schuster.
- Wolverton, M., M. Wolverton, and W. Gmelch. 1999. “The impact of role conflict and ambiguity on academic deans.” *Journal of Higher Education* 70.
- Wolverton, M., W. Gmelch, J. Montez, and C. Nies. 2001. *The changing nature of the academic deanship* vol. 28, no. 21. San Francisco: Jossey Bass.
- Zaleznik, A. 2004. “Managers and leaders. Are they different?” *Harvard Business Review* 82 (6).

[Back to contents](#)





## **Mobile devices and development of learning strategies**

***Davide Parmigiani, Andrea Traverso, Valentina Pennazio, Alessia Olivieri & Marta Giusto***

*University of Genoa, Italy*

davide.parmigiani@unige.it, a.traverso@unige.it, valentina.pennazio@unige.it,  
o.alessia.ao@gmail.com & marta.giusto@gmail.com

### **Abstract**

This research was carried out in the Italian lower and upper secondary schools and was aimed at analysing the role of mobile devices for the development of pupils' learning strategies. The participants were: 57 pupils (aged 12) and 27 pupils (aged 15). We collected the data through a one-to-one semi-structured interview to all participants with five questions related to the research aims. The qualitative analyses highlighted that mobile devices support: the organization of study even if there is still a risk of distraction; the flexibility in using materials, instruments, other medias because they can support the interaction among several devices; finally, the strategic elaboration of materials and devices because they help pupils in retrieving materials and information, but it is still significant the difference between the possibility to connect several kinds of information and the possibility to create interesting digital products.

**Keywords:** mobile devices; secondary school; learning strategies.

### **Context of the research**

Technologies and, in particular, mobile devices have had a rapid development in recent years and they will continue to grow up in the world, involving the school and the educational contexts in general. This is the reason for which we decided to conduct this research. We were interested whether the use of mobile devices at school could affect the development of pupils' learning strategies. In particular, we wanted to observe the potential changes in the organization of study, the flexibility in using materials and the strategic elaboration of materials and devices. The overall research purpose was to analyse the real situation in the school context, with the intention to confirm or deny the popular conviction that the simple use of mobile devices can contribute to the learning improvement. We collected qualitative data through semi-structured interviews, carried out with the pupils throughout the school year. We selected the participants in two different kinds of secondary schools: lower and upper. The first one welcomes pupils aged between 11 and 13, the second one welcomes pupils aged between 14 and 19. So we had the opportunity to underline and highlight the potential differences between the two different groups.

### **Research questions**

The study was aimed at analysing the role of mobile devices for the development of pupils' learning strategies. In particular, we can specify the research questions as follows: 1. How do the mobile devices affect the development of pupils' learning strategies in organizing their study methods? 2. How do the mobile devices affect the development of pupils' learning strategies for the flexibility in using materials, instruments, other medias? 3. How do the mobile devices affect the development of pupils' learning strategies for the strategic elaboration of materials and devices organizing their study methods?

### **Theoretical framework**

#### ***Mobile devices at school***

The use of mobile devices at school is based on the concepts of digital literacies (Gillen and

Barton 2009), multiliteracies and transliteracies (Cazden et al. 1996), ubiquitous learning (Cope and Kalantzis 2009) and cloud computing (Cope and Kalantzis 2012). The introduction of mobile devices in the school allows us to reflect both on educational teaching practices of the formal context, both on the possibility of knowledge of the informal context. Therefore, mobile devices connect the formal dimension with the informal dimension making the learning “mobile”. In the literature (Ranieri 2011; Bruschi and Carbotti 2012) there are five different approaches to mobile learning. The first approach focuses on “mobile” and “technology”: mobile technologies allow you to disseminate information without limits of time and space (Godwin-Jones 2011). In this approach, the attention is focused on the ubiquitous power of mobile devices, but not on the impact of mobile devices in teaching and learning. The second approach focuses the mobile learning as an evolution of e-learning: mobile learning has the same potential and criticality of e-learning and his evolution concerns the technological component but not the teaching component. This approach does not highlights the complexity of the new educational context. The third approach focuses the mobile learning as an element that integrates the formal education: the “mobile” is an informal context but it may be used in the formal educational practices; therefore the mobile learning uses the ubiquity to establish a continuity with the school. The fourth approach focuses mobile learning for the “mobile learn”: mobile devices allows students to be able to learn even if they are not in school. Learning emerges from the interaction with the contents and the interaction with other people through 2.0 applications (social networks, forums, blogs). The fifth approach focuses mobile learning for a “mobile society” and a “mobile culture”: the mobile devices show their relevance and presence in the contexts related to learning and also in other situations and in other components of the social system. This “ecological” perspective is the most useful for analysis and application of mobile devices in school. As claimed by Park (2011) the most important technologies are those that are perfectly integrated with a learning environment. In this environment the most important aspects are: students, contents and practices of teachers. In fact, the use of mobile devices allows you to use interactive, stimulating, engaging contents. Even a ludic application may allow learning (the term “education” is not always synonymous of boring). The teacher must pay attention to the type of contents offered and to the strategies and the methodologies that he/she uses to present the contents. When teachers don’t pay attention to these aspects, the mobile devices and the applications can become useless, they can be cause distraction and cognitive overload (Calvani 2009).

### ***Mobile devices and learning strategies***

The international scientific literature underlines some potential benefits which are directed towards the development of inquiry and hypothesis formation activities (Ahmed and Parsons 2013); collaboration and argumentation activities (Laru 2012; Laru et al. 2012); problem-solving and problem-based learning activities (Sánchez and Olivares 2011); collaboration in classroom to improve face-to-face collaborative learning activities (Echeverría et al. 2011). In addition to these aspects, the use of the mobile devices at school can also encourage the development of some learning strategies. The learning strategies are intentional and controlled processes that allow you to learn and remember more (Pettenò, Tressoldi, and Cardinale 1990; Legrenzi 1994; Cornoldi, De Beni, and MT Group 2001) through the processing of contents. Some strategies are cognitive (reading, underline, take notes), other strategies are metacognitive (creating diagrams, concept maps, summaries; organizing study material; connecting different types of information obtained from different devices; recovering materials and information of different types). The strategies are distinguished, depending on the phase in which are implemented, in: acquisition strategies (Cook and Mayer 1983); strategies for browsing (Zielke 1991) and understanding (De Beni and Pazzaglia 1995); memory strategies (Hall, Hall, and Saling 1999); use of mental images (De Beni, Pazzaglia, and Moe 1995) and associations. The mobile devices lead students to put into practice some of the actions that are associated with cognitive and metacognitive learning strategies: reading, underline, take notes, connect different types of information (Huang et al. 2012; Hutchison et al. 2012; Kagohara et al. 2012). These strategic actions are often carried out in an unconscious way by students while these to be effective, must be applied in a conscious way. In fact, it is necessary that

the student knows the different strategies, the usefulness of different strategies but he also should be able to use them at the right time (Pressley, Borkowski, and O’Sullivan 1985). Other necessary aspects for students are: the knowledge of a topic, self-awareness, self-regulation skills (Zimmerman 1990; Calvani 2011) and strategic coherence. The strategic coherence enables to use learning strategies that are considered effective and delete those which are considered less valid. The use of mobile devices at school should increase also students’ motivation and concentration (Keane et al. 2013; Kalz et al. 2014). These two aspects are very important because they support a strategic approach to the task. In fact, mobile devices have applications that can encourage interaction, collaboration and community building in presence and online. Each student becomes, at the same time, user and author of digital materials. This involvement should foster a bigger motivation in facing the instructional tasks, promote the discussion of the learned knowledges (metacognitive strategy). In addition, the mobile devices tend to connect the informal contexts with the formal ones (usually perceived as distant from students) (Jahnke 2013). Tiene and Luft (2001) argue that it is common in any technology-rich learning context for students to be motivated and focused because of the tools themselves and the learning opportunities they facilitate. In general, the researches emphasize that mobile devices can solicit aware learning strategies and motivation for the task when they change a passive task in a “problem posing”, to which should correspond an active problem solving (Lumbelli 2009). In fact, students’ new forms of learning and the use of strategies are not encouraged by mobile devices, but rather by the teaching methodology associated at the use of mobile. This teaching method is characterized by a reversal of the action student-teacher, as theorized in the concept of Flipped Lessons (Mazur 1991) and in subsequent concepts Inverted Classroom (Lage, Platt, and Treglia 2000) and Classroom flip (Baker 2000). This method refers also to Situated Learning Episodes (Rivoltella 2013).

### ***Pitfalls of mobile devices***

In conclusion, the presence of mobile devices at school is not enough to develop a strategic approach to the task (Looi et al. 2009; Laru 2012) by students. Mobile devices are motivating and can urge the use of strategies, but without a correct design by the teacher may cause distraction and cognitive overload (Calvani 2009). For these reasons it is necessary to underline also the pitfalls (Peluso 2012) of the use of mobile devices. The international literature highlights some issues related to technical and practical difficulties, including small screens and limited input options (Ting 2012); some limits in argumentation activities (Laru et al. 2012); some limits regarding the mobile devices acceptance affected by the role of the social influence (parents and peers) and the expectation of having a more enjoyable learning experience (Montrieux et al. 2013); the comparison between mobile devices and computers or printed books linked to the weak sides of tablets, mainly problems with internet connection and compatibility with other devices (Seisto et al. 2011); the potential carelessness during the lessons caused by playing with apps, surfing on web, chatting, etc. (Schnackenberg 2013). Some difficulties are due to many applications that can be used. Students and teachers before choose an app, must evaluate if this is an appropriate tool in relation to what they must do (Jonas-Dwyer 2012). Finally, there is the danger that the mobile devices have a negative impact on the commitment of the students (Hutchison et al. 2012; Attard and Northcote 2011; Banister 2010)

## **Research methodology**

### ***Context, participants and procedure***

This research has been carried out in the Italian lower and upper secondary schools. The former welcomes pupils aged between 11 and 13, the latter welcomes pupils aged between 14 and 19. We selected the participants in two school levels, in order to underline potential differences. In particular the participants were: 57 pupils (1st grade of lower secondary school - aged 12); 27 pupils (1st grade of upper secondary school - aged 15). The research design was based on two phases. The former was focused on teachers’ training in order to encourage them to use mobile

devices during their lessons, suggesting the suitable apps to carry out several teaching strategies, like flipped lessons and collaborative learning. The latter provided a data collection regarding the research aims.

### ***Instrument and qualitative data***

The data collection has been carried out through a one-to-one semi-structured interview to all participants with five questions related to the research aims. The first two questions were related to the organization of study (how do you use the mobile device when you're studying at home? Does the mobile device help you in managing your study at home?). The 3rd question was focused on the flexibility in using materials, instruments, other medias (When you're studying, do you use only the mobile device or also other instruments?). Finally, the last two questions were focused on the strategic elaboration of materials and devices (When you're studying with your mobile device, can you create digital materials, take notes, look for information? When you're studying with your mobile device, are you able to connect different kinds of information?). We chose to collect qualitative data, since we wanted to analyse thoroughly the ideas of pupils about their own learning strategies.

### ***Data collection and analysis***

We analysed the data with a software for the text analysis (T-LAB ver. 7.2) and we carried out the following qualitative analyses: co-word analyses, word associations and cluster analyses. The co-word analysis (also named mapping) has been done through the factor analysis with Sammon method. This method displays the used words within Cartesian axes to underline the semantic polarizations. The words are spread through the axes on the basis of their meaning and their position within the text (proximity/distance). Instead, the cluster analysis examines less words than the previous one, so we can aggregate them, not only from a semantic point of view and on the basis of their position, but also from a logic point of view and on the basis of the structure of the sentences. Finally, the word association measures the co-occurrence frequencies of all words with some keywords considered as central for the research questions.

## **Findings**

### ***Data analysis: 1<sup>st</sup> research question***

Regarding the first research question, we drew the mapping of the most used words by the pupils, answering the first and the second question of the semi-structured interview. The Figure 1 shows the results. We grouped the words according to the proximity and by the similarity in a didactic sense, namely we grouped the words which refer to similar situations in the classroom.

The words' group in the upper right part of Figure 1 indicates clearly the studying activities carried out by the pupils at home with their tablet. They read, underline, repeat and use applications to take notes and create summaries or diagrams. In this way, they can study more thoroughly. The second important words' group is in blue. Those words show that pupils use the tablet to study with the digital books included into their devices, but together with paper books and exercise books. This group indicates explicitly that the pupils use the digital devices in connection with the analog and traditional instruments. In the lower left part of the Figure 1, we can underline the green word group related to the use of the net and the consequent opportunity to share their studying methods with their schoolmates or other friends. The words indicate that the pupils look for information on the internet and share files or concept maps in order to help (or to ask for help) some schoolmates the days before an oral (or other kinds of) test. During those activities, in particular while they are surfing the net, they are tempted by the possibility to download games (the red word group).

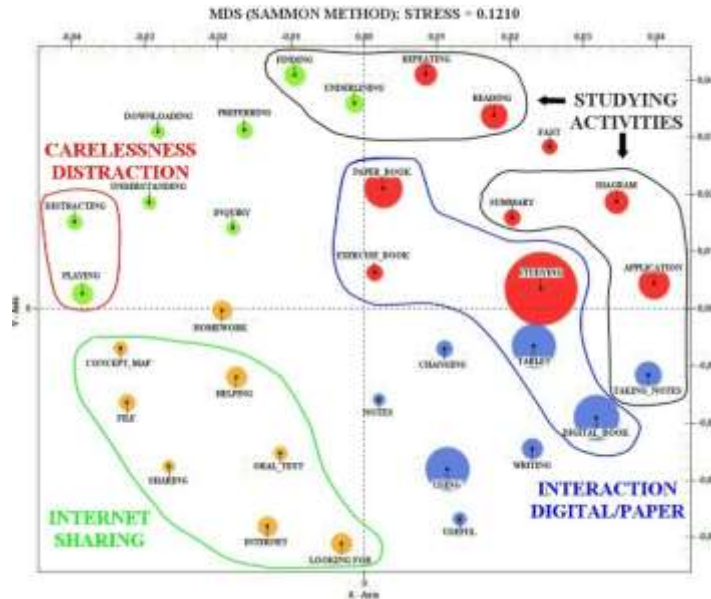


Figure 1. Co-word analysis concerning the 1<sup>st</sup> research question

So the possibility to distract themselves is still high. In order to investigate deeply how do the mobile devices affect the development of pupils’ learning strategies in organizing their study methods, we extracted the clusters from the data. The clusters 1, 3 and 4 represent the core of the studying activities. They indicate that the pupils concentrate their study methods in repeating, reading, underlining and understanding, through the creation of diagrams and summaries. “I create diagrams with some applications...it’s really easier and faster do it with the tablet”. They confirm the use of several devices (paper books, exercise books and tablets) but they underline also the risk of opposing the digital devices against the paper ones: “I read the digital books to study and I create diagrams to summarize the information, but I’m about to play and download something. I prefer paper books...they don’t distract me”.

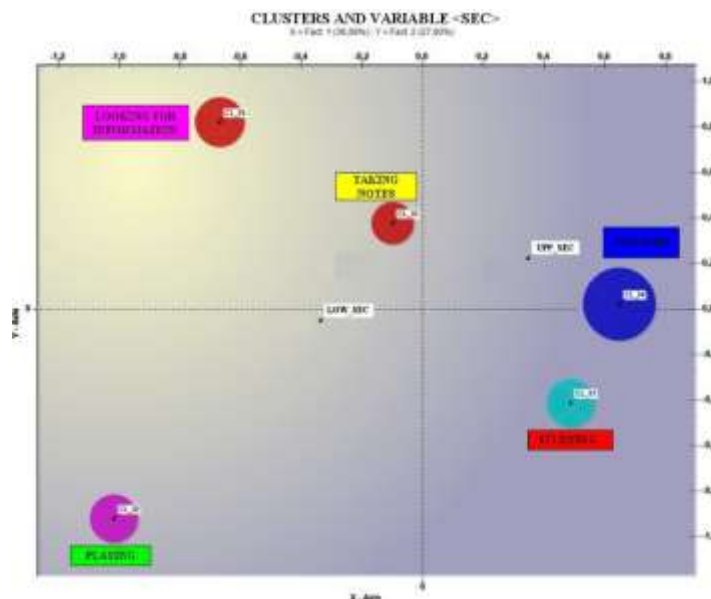


Figure 2. Clusters and variable concerning the 1<sup>st</sup> research question

At the end of this sentence, the pupil emphasizes again the possibility of distraction (cluster

2). Fortunately, the high distance of the cluster 2 from the other ones shows that the possibility of distraction is far but still present. The cluster 5 points up the specific role of internet in studying with the tablet.

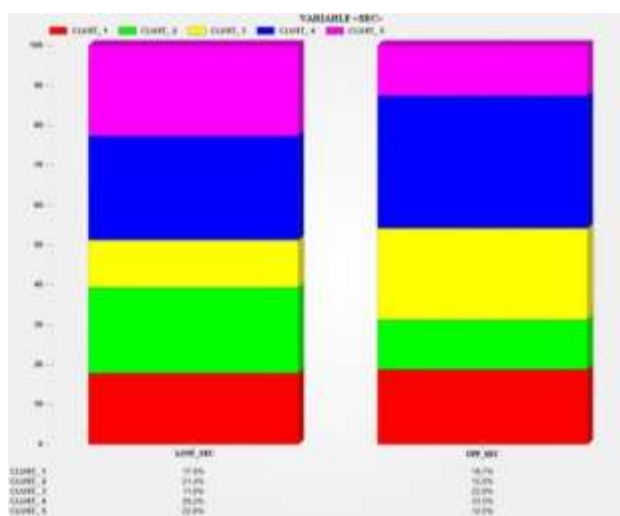


Figure 3. Clusters' percentage within the variable <SEC>

The opportunity to read the digital books in connection with a good information retrieval can add value to the pupil studying methods. Unfortunately, the distance from the centre of the studying activities reveals that the pupils are not aware yet of this opportunity provided by the tablet. The last remark concerning the first research question is related to the distance and the differences between the words used by the pupils of the lower and the upper secondary level. As already shown in Figure 2, the position of upper secondary pupils (UPP\_SEC) is located in the middle of clusters 4, 3 and 1. This means that the upper secondary pupils can use the tablet to study, creating diagrams, materials and taking notes. Instead the pupils of lower secondary level stressed the importance of the net, but they revealed also high risks of distraction. The figure 3 shows clearly the percentage of each cluster, according to the variable <SEC>, lower and upper secondary level.

#### **Data analysis: 2<sup>nd</sup> and 3<sup>rd</sup> research question**

For the second and the third research questions, we focus our attention on the mapping shown in the figure 4. We analysed the words most used by the pupils, answering the third, the fourth and the fifth question of the semi-structured interview. The words grouped into the green ring confirm the observation underlined in the previous paragraph. The pupils are able to use several kinds of devices while they are studying. This indicates that they are flexible in using materials, instruments and other medias. They do not use only one kind of device but they tend to compare and combine different sources of information. Regarding the third research question, the words grouped in the red ring and the blue one indicate that, firstly, the pupils are aware of the opportunity offered by the mobile devices in order to use the net to look for useful information. With this information, they can create materials (diagrams, summaries, notes, etc.), improving their strategic elaboration of materials and devices and organizing better their study methods. Secondly, the words included into the blue ring show that the pupils use the mobile devices to connect the information provided by the teachers during the lessons, with further information retrieved on internet.

However, it is important to analyse deeply whether the ability in connecting information and creating materials is strong or weak. In fact, the mapping shows only the words used by the pupils, but it does not indicate the strenght of the relationship. The cluster analysis (see Figure 5) confirms that the pupils are flexible in using materials, instruments and other medias (clusters 2 and 4). In

particular, the lower secondary pupils are especially skilled in using several types of devices.

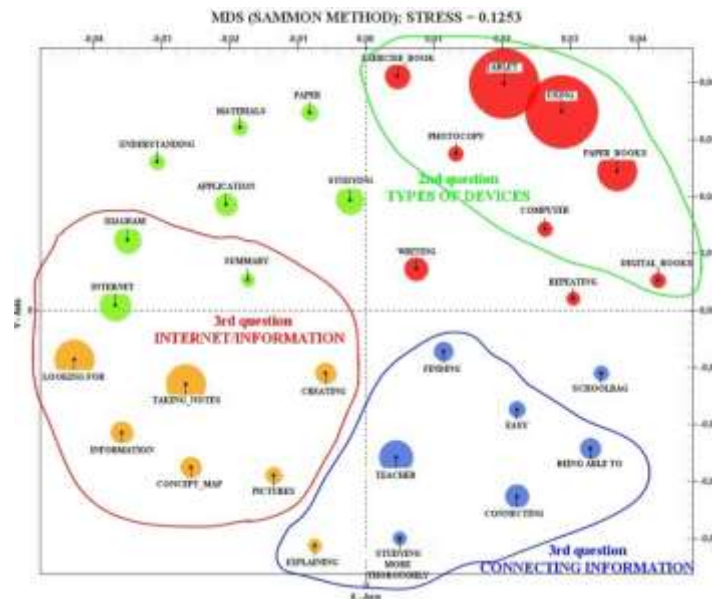


Figure 4. Co-word analysis concerning the 2<sup>nd</sup> and the 3<sup>rd</sup> research questions

Instead, the upper secondary pupils are more talented in connecting information. Probably, the 15-year-old pupils have already crossed the problem concerning the use of digital or analog devices, and they can focus their attention and concentration on the opportunities of connecting information to improve their studying methods.

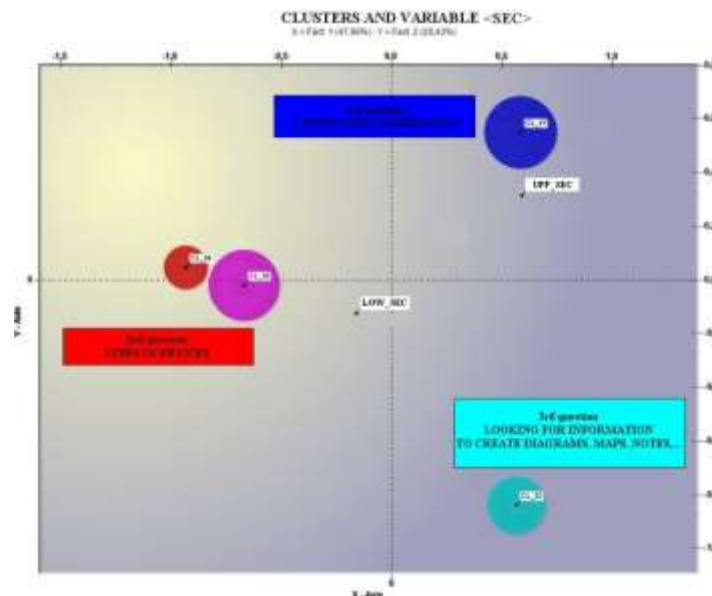
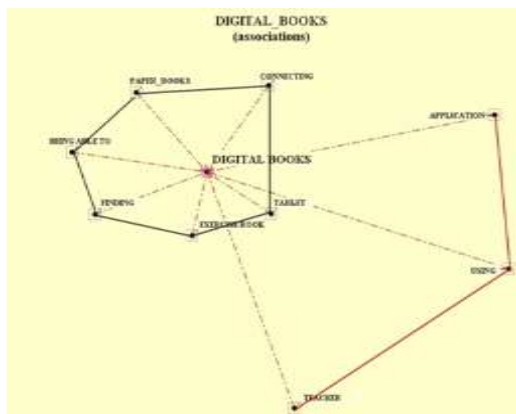


Figure 5. Clusters and variable concerning the 2<sup>nd</sup> and the 3<sup>rd</sup> research questions

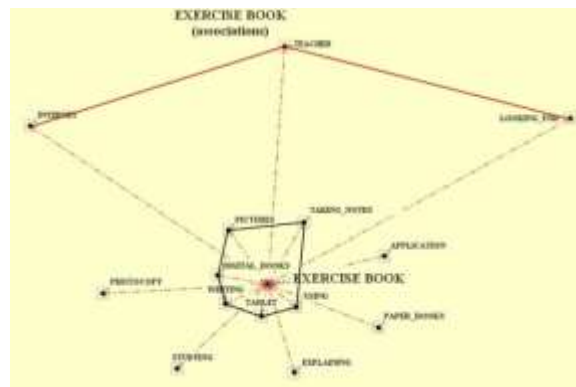
It is important to emphasize and underline the distance between the ability in connecting information (cluster 1) and the ability in using such information in order to create meaningful digital materials (cluster 3) significant. We can state that the cluster analysis suggests us that it is still statistically significant the difference between the possibility to connect several kinds of information and the possibility to create interesting digital products which can show the pupils’ learning processes. Especially, the 12-year-old pupils are still far from the ability to use and



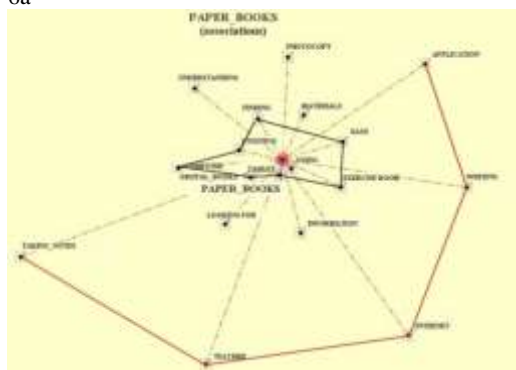
connect information in order to study more thoroughly. Since this is a key point for our research, in order to bring out the pupil learning strategies, we carried out also some word associations, focusing our attention on some keywords, strictly correlated with the research questions. We selected the following keywords for the second research question: digital book, paper book and exercise book, because they can explain deeply the relationship among the different devices and the learning strategies. As we stressed previously, the interaction among the digital and analog devices is high. In fact, the words like paper book, digital book, tablet, exercise book are very close, indicating a high level of co-occurrences. Nevertheless, in the figure 6a, 6b and 6c we notice that the words “looking for” and “internet” or “application”, “teacher” and “taking notes” are far from the centre. This is a clear indication that it is still difficult to connect effectively the analog devices (books, etc.) and the opportunities offered by internet (mainly for the lower secondary level). The pupils use several devices but they struggle to connect the respective potentialities. The figure 7, with the keywords “taking\_notes” (cluster 3) and “connecting” (cluster 1), correlated with the third research questions, confirms that the ability in connecting information (see Figure 7b) is not yet clearly connected to the advanced learning strategies. In fact, the terms like “explaining”, “studying”, “materials” and “diagram” are still far from “connecting”. We can quote some sentences said by the pupils to argue this assertion. “I do not use the tablet to take notes, I use it to do some inquiries”. “I take some notes at school, then I look for information on internet and I make some concept maps”. “During the science lessons, I request to use the paper to take notes even if I use the tablet to draw the diagrams”.



6a

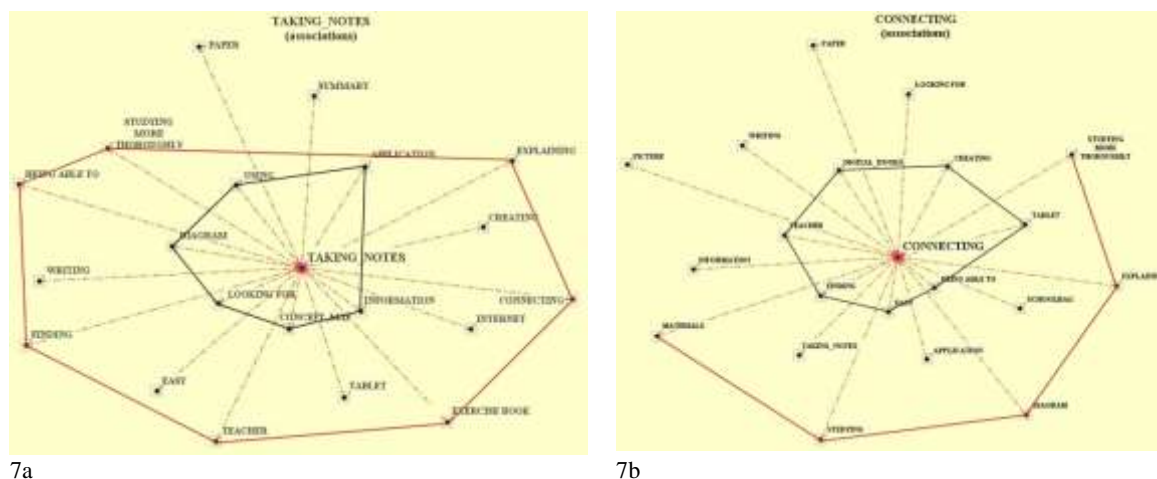


6b



6c

Figure 6. Word associations concerning the 2nd research question



7a

7b

Figure 7. Word associations concerning the 3rd research question

### Conclusions and implications for teacher education

After this research, we can draw and outline some findings about the contribution of the mobile devices for the development of learning strategies. Regarding the 1<sup>st</sup> research question, we can state that the mobile devices help pupils in:

- carrying out several studying activities (taking notes, creating diagram, etc.): in this way, the mobile devices allow pupils to improve their study methods because they offer several opportunities for managing information;
- looking for information to study more thoroughly: mobile devices allow pupils to find information whenever they want or they need, so they are able to integrate the information provided in the classroom with further information, in order to implement their studying methods;
- sharing materials with their schoolmates: the use of mobile devices in the classroom supports the creation of online formal and informal groups and communities, so the pupils have the opportunity to share, compare and elaborate materials during their studying period at home;
- there is still a high risk of distraction, mainly for the lower secondary level, because the pupils feel the temptation to play, download music/games or chat while they are studying.

Regarding the 2<sup>nd</sup> question, we can state that the mobile devices:

- do not limit the possibilities to use other devices (books, exercise books, PC, etc.), on the contrary they can support the interaction among several devices: this is an important point because, firstly, it indicates that the pupils have the possibility to get more sources of information and, secondly, the pupils are flexible from a learning strategy point of view;
- it is still difficult to connect effectively the analog devices (books, etc.) and the opportunities offered by internet, mainly for the lower secondary level: the pupils use several devices but they struggle to connect the respective potentialities; this is a key point for the education of student teachers in using mobile devices for their future educational commitments.

Regarding the 3<sup>rd</sup> question, we can state that the mobile devices:

- help pupils, from a technical point of view, in retrieving materials and information in order to implement diagrams, maps, and notes created with the digital devices: the pupils start to elaborate information and materials but they have some difficulties in changing this kind of elaboration into a real strategic elaboration, in order to improve their studying methods;
- it is easier to compare and connect what the teachers tell in the classroom with the information retrieved on internet: in particular, the upper secondary pupils are able to

combine several information effectively;

- it is still significant the difference between the possibility to connect several kinds of information and the possibility to create interesting digital products which can show the learning processes of pupils: at the moment, we observed that the mobile devices offer the platform for a good strategic elaboration of materials, but teachers should support this process, because it seems that pupils are not able yet to exploit completely and properly the potentialities of mobile devices;
- in addition, there is still a great difficulty, for the lower secondary pupils, in order to connect information: as indicated in the previous point, the pupils have to be supported in finding links among several and different kinds of information.

To conclude, in mobile education, the role of teachers is still fundamental for two reasons. The former is focused in the planning activities: the teachers have to arrange and set up suitable mobile activities for the pupils with different ages. In case the activities are too complex, in the sense that the tasks require too high-level cognitive abilities, the pupils cannot manage too many kinds of information and, consequently, they cannot catch the opportunity to connect information in an effective way. The result can be a cognition overload. Just for this, the second reason is focused on the support typology provided by the teachers during the mobile activities. It is necessary that teachers help pupils to find connections between information provided by different teachers or arised from several activities. In this way, it is more likely that the pupils can develop good learning strategies and be aware of the potentialities of mobile devices in a step-by-step and autonomous way.

## References

- Ahmed, S., and D. Parsons. 2013. “Abductive science inquiry using mobile devices in the classroom.” *Computers & Education* 63: 62-72.
- Attard, C., and M. Northcote. 2012. “Mathematics on the move: using mobile technologies to support student learning (Part 2).” *Australian Primary Mathematics Classroom* 17 (1): 29-32.
- Banister, S. 2010. “Integrating the iPod touch in k-12 education: vision and vices.” *Computers in the Schools* 27 (2): 121-131.
- Baker, W. 2000. *The classroom flip. Using web course management tools to become the guide on the side*. Paper presented at the 11 International Conference on College Teaching and Learning, Jacksonville, FL.
- Bruschi, B., and S. Carbotti. 2012. *Per imparare c'è un'app*. Roma: Aracne.
- Calvani, A. 2009. *Teorie dell'istruzione e carico cognitivo*. Trento: Erickson.
- Calvani, A. 2011. *Principi dell'istruzione e strategie per insegnare*. Roma: Carocci.
- Cazden, C., B. Cope, N. Fairclough, J. Gee, M. Kalantzis, G. Kress, A. Luke, C. Luke, S. Michaels, and N. Nakata. 1996. “A pedagogy of multiliteracies: designing social futures.” *Harvard Educational Review* 66 (3): 60-87.
- Cook, L., and R. Mayer. 1983. “Reading strategies training for meaningful learning from prose.” In *Cognitive Strategy Research. Educational Applications*, edited by M. Pressley and J. Levin, 87-131. New York: Springer-Verlag.
- Cornoldi, C., R. De Beni, and Gruppo MT. 2001. *Imparare a studiare 2*. Trento: Erickson.
- Cope, B., and M. Kalantzis. 2009. Multiliteracies: “new literacies, new learning.” *Pedagogies: An International Journal* 4 (3): 164-195.
- Cope, B., and M. Kalantzis. 2012. “Towards a new learning: the scholar social knowledge workspace in theory and practice.” *E-learning and Digital Media* 10 (4): 332-356.
- De Beni, R., A. Moè, and F. Pazzaglia. 1995. “Immagini mentali e memoria.” In *Le immagini mentali. Teorie e processi*, edited by F.S. Marucci, 103-144. Roma: La Nuova Italia Scientifica.

- De Beni, R., and F. Pazzaglia. 1995. *La comprensione del testo. Modelli teorici e programmi di intervento*. Torino: UTET.
- Echeverría, A., M. Nussbaum, J. Calderón, C. Bravo, C. Infante, and A. Vásquez. 2011. “Face-to-face collaborative learning supported by mobile phones.” *Interactive Learning Environments* 19 (4): 351-363.
- Gillen, J., and D. Barton. 2009. *Digital Literacies. A discussion document for TLRP-TEL*. (Teaching and Learning Research Programme - Technology Enhanced Learning - workshop on digital literacies). Lancaster University 12-13 March 2009. <http://tel.ioe.ac.uk/wp-content/uploads/2009/02/digital-literacies-gillen-barton-2009.pdf>
- Godwin-Jones, R. 2011. “Emerging technologies: mobile apps for language learning.” *Language Learning and Technology* 15 (2): 2-11.
- Hall, R., M. Hall, and C. Saling. 1999. “The effects of graphical postorganization strategies on learning from knowledge maps.” *Journal of Experimental Education* 67 (2): 101-112.
- Huang, Y., T. Liang, Y. Su, and N. Chen. 2012. “Empowering personalized learning with an interactive e-book learning system for elementary school students.” *Educational Technology Research and Development* 60 (4): 703-722.
- Hutchison, A., B. Beschomer, and D. Schmidt-Crawford. 2012. “Exploring the use of the iPad for literacy learning.” *Reading Teacher* 66 (1): 15-23.
- Jahnke, I. 2013. “Informal learning via social media. Preparing for didactical designs.” In *Science and the Internet*, edited by A. Tokar, M. Beurskens, S. Keuneke, M. Mahrt, I. Peters, C. Puschmann, T. van Treeck, and K. Weller, 59-72. Dusseldorf: Dupress.
- Jonas-Dwyer, D., C. Clark, A. Celenza, and Z. Siddiqui. 2012. “Evaluating apps for learning and teaching.” *International Journal of Emerging Technologies in Learning* 7(1): 54-57.
- Kagohara, D., J. Sigafos, D. Achmadi, M. O’Reilly, and G. Lancioni. 2012. “Teaching children with autism spectrum disorders to check the spelling of words.” *Research in Autism Spectrum Disorders* 6 (1): 304-310.
- Kalz, M., O. Firssova, D. Börner, S. Ternier, F. Prinsen, E. Rusman, H. Drachsler, and M. Specht. 2014. “Mobile inquiry-based learning for sustainability education in secondary schools.” In *Effects on knowledge and motivation. 2014 IEEE 14th International Conference on Advanced Learning Technologies*, 644-646.
- Keane, T., C. Lang, and C. Pilgrim. 2013. “Pedagogy, ipadology, netbookology: learning with mobile devices.” *Journal of ICT in Education* 35 (1): 11-17.
- Lage, M., G. Platt, and M. Treglia. 2000. “Inverting the classroom. A gateway to creating an inclusive learning environment.” *Journal of Economic Education*, Winter: 30-43.
- Laru, J. 2012. Scaffolding learning activities with collaborative scripts and mobile devices, *Scientiae Rerum Socialium*, University Of Oulu, September 30. <http://herkules.oulu.fi/isbn9789514299407/isbn9789514299407.pdf>
- Laru, J., S. Järvelä, and R.B. Clariana. 2012. “Supporting collaborative inquiry during a biology field trip with mobile peer-to-peer tools for learning: a case study with K-12 learners.” *Interactive Learning Environments* (2): 103-117.
- Legrenzi, P. 1994. *Prepararsi agli esami. Tecniche e strategie per superare gli esami universitari*. Bologna: Il Mulino.
- Looi, C., L. Wong, H. So, P. Seow, Y. Toh, W. Chen, and B. Zhang. 2009. “Anatomy of a mobilized lesson: learning my way.” *Computers & Education* 53 (4): 1120-1132.
- Lumbelli, L. 2009. *La comprensione come problema*. Roma-Bari: Laterza.
- Mazur, E. 1991. “Can we teach computers to teach?” *Computers in Physics*, Jan/Feb: 31-38.
- Montrieux, H., C. Courtois, F. De Grove, A. Raes, T. Schellens, and L. De Marez. 2013. “Mobile learning in secondary education: perceptions and acceptance of tablets of teachers and pupils.” *International Conference Mobile Learning*: 204-208.

- Peluso, D. 2012. “The fast-paced ipad revolution: can educators stay up to date and relevant about these ubiquitous devices?” *British Journal of Educational Technology* 43 (4): 125-127.
- Pettenò, L., P. Tressoldi, and M. Cardinale. 1990. *Lo studente di successo*. Pagus: Treviso.
- Pressley, M., J. Borkowski, and J. O’Sullivan. 1985. “Children’s metamemory and the teaching of memory strategies.” In *Metacognition, Cognition, and Human Performance*, edited by D. Forrest-Pressley, G. MacKinnon, and T. Waller, 111–153. Orlando, FL: Academic Press.
- Ranieri, M. 2011. “Mobile learning and social inclusion. The hopes and the reality.” *ICT for inclusive learning: the way forward*, 64–65.
- Rivoltella, P.C. 2013. *Fare didattica con gli EAS*. Brescia: La Scuola.
- Sams, A., and J. Bergmann. 2013. “2Flip your students’ learning.” *Educational Leadership* 70, (6): 16-21.
- Sánchez, J., and R. Olivares. 2011. “Problem solving and collaboration using mobile serious games.” *Computers & Education* 57: 1943-1952.
- Schnackenberg, H. 2013. “Tablet technologies and education.” *International Journal of Education and Practice* 1 (4): 44-50.
- Seisto, A., M. Federley, T. Kuula, J. Paavilainen, and S. Vihavainen. 2011. “Involving the en-users in the development of language learning material.” *International Journal of Mobile and Blended Learning* 3 (2): 43-56.
- Sharples, M., I. Sanchez, M. Milrad, and G. Vavoula. 2009. “Mobile learning: small devices, big issues.” In *Technology Enhanced Learning: Principles and Products*, edited by N. Balacheff, S. Ludvigsen, T. Jong, A. Lazonder, and S. Barnes, 233–249. Heidelberg: Springer.
- Tiene, D., and P. Luft. 2001. “Teaching in a technology-rich classroom.” *Educational Technology* 41: 23-31.
- Ting, Y. 2012. “Using mobile technologies to create interwoven learning interactions: an intuitive design and its evaluation.” *Computers & Education* 60: 1-13.
- Zielke, W. 1991. *Le tecniche di lettura rapida*. Milano: Franco Angeli.
- Zimmerman, B. 1990. “Self-regulated learning and academic achievement.” *Educational Psychologist* 25 (1): 3-17.

[Back to contents](#)

## **The interactive whiteboard as an artefact to support exploratory talk in primary school classrooms: a co-inquiry project between practitioners and researchers**

*Gerd Wikan & Kari Nes*

*Hedmark University College, Norway*

gerd.wikan@hihm.no

### **Abstract**

The point of departure for this article is that interactive whiteboards (IWB) in the classroom have the potential to support learning, in particular when the teacher has a dialogic teaching style. In the paper, we present the main findings from a participatory research project where this issue was explored. Our main research question was; under which circumstances can the teacher's use of interactive whiteboard stimulate conceptual interactivity in the classroom? We saw what most researchers have observed, namely that the IWB in itself does not make this happen. Only the teacher can help to establish a genuine dialogue. An artefact, like the IWB, is only as useful as the teacher allows it to be.

**Keywords:** interactive white board (IWB); classroom study; dialogic space; interaction.

### **Context of the research**

Manufacturers sell interactive boards as a technical aid with the capacity to increase interactivity in the classroom situation. The board offers the teacher easy access to sources and a flexibility to support and investigate ideas that come up during lessons. “Its particular affordances offer strong support for cumulative, collaborative and recursive learning. Its effective use by teachers can provide appropriate scaffolding to help create knowledge through opening up dialogic space.” (Hennessy, Mercer, and Warwick 2011, 483). However, without a conscious focus on using IWBs to promote interactive teaching, research shows that they are only used to support existing pedagogy, and that traditional patterns of classroom interaction persist (Beauchamp 2004; Blau 2011; Twiner, Coffin, Littleton, and Whitelock 2010; Nes and Wikan 2013; Wikan and Mølster 2010). It is easy for most teachers to incorporate them into existing practices, such as in the case of teacher-guided instruction (Digregorio and Sobel-Lojeski 2009-2010; Smith, Hardman and Higgins 2006). In our study in Norwegian classrooms, this conclusion is supported: the potential of the IWB to help establish a dialogic space is not being exploited (Nes and Wikan 2013). Glover, Miller, Averis and Door (2007) also claim that teachers often use the IWB as a traditional board and seldom to support reflection. The intriguing question is under which circumstances the teacher's use of interactive whiteboard may stimulate the reflective dialogue in the classroom. Theoretically, the IWBs multimodal functionality, offering smooth, rapid flows between text, pictures, sounds and movies, gives the potential to stimulate reflective talk and dialogical space.

### **Research questions**

The main research question in this study is; under which circumstances can the teacher's use of IWB stimulate conceptual interactivity in the classroom? Sub-questions are; in what way and to what extent is the use of IWB supporting exploratory talk among pupils or pupils/teacher? How can the potential of the IWB for stimulating exploratory talk in the classroom be maximised?

### **Theoretical framework**

Our research is embedded in a social constructive learning philosophy implying that interaction between learners as well as between learners and teacher will lead to increased insights for everyone. Dialogue is seen as a characteristic of education, but not all learner talks are dialogic; there are different types of pupil conversations, and these will be introduced below.

The dialogic space is not to be understood as a physical space, but as the social entity in which one can think and interact. In education, the dialogue is not just a means but also an end in itself, since education involves a shift from monological to dialogic thinking (Wegerif 2007). Mercer, Warwick, Kershner, and Staarman (2010) are studying learners’ opportunities for learning in interaction by interacting with others, and they note that certain forms of digital technology can be the instruments for such learning. They use dialogic space (Wegerif 2007) as a term to describe the arena for the common learning activities. They argue that interactive whiteboards have the potential to support the creation of dialogic space. Mercer’s own research has shown that with proper guidance learners can learn not only to interact, but to “interthink” (Mercer 2000). Interthinking means more than just interacting, it means developing joint understanding of curriculum topics. In order for this to take place pupils need to develop their talking skills.

In the dialogic classroom, it is essential to encourage children to talk and discuss, but how the learners talk is not irrelevant. Mercer and Littleton (2007) distinguish between three different types of talk: exploratory, disputational and cumulative talk. Exploratory talk is the most effective for collective problem solving. In the exploratory talk, learners share all relevant information, and they are critical and constructive. They are active, ask each other questions and listen to other people’s answers in order to arrive at a common result. In science education the way several aspects of exploratory talk influence learning outcomes positively has been documented (Howe, Tolmie, Thurston, Topping, Christie, Livingstone, Jessiman, and Donaldson 2007). Disputational talk is the second type of talk; according to Mercer et al. (2010), a characteristic of this style of talk is that learners do not share relevant information, but rather compete among themselves according to their individual interests. According to the authors, this conversation form is not associated with inclusive or cooperative behaviour or with good learning results. The third talk type of talk is cumulative talk. This includes, for example, “brainstorming”, which can be helpful in introducing a new theme. The aim is to facilitate exploratory conversation in the classroom. This talk is friendly and co-operative, but lacks the critical-constructive perspective inherent in exploratory conversation. Some researchers find that also cumulative talk is important because it allows a variety of opinions to be expressed, and, in the case of classes with special needs - children in particular - this might be the most one can achieve (Warwick, Hennessy and Mercer 2011). Along with exploratory talk, we consider cumulative talk - although less advanced - to have the potential to support conceptual interactivity in the classroom.

Through their studies in science Mercer et al. (2010) show how, under certain conditions, the use of interactive whiteboards has the potential for creating a dialogic space through the support of exploratory talk. However, in order to achieve a learning community where the IWB supports learning, it is necessary to develop “talk rules” for conversation and collaborative reasoning” (Kershner, Mercer, Warwick, and Staarman 2010, 381). By talk rules is meant concrete spoken and written rules that both the learners and teacher must obey. These can for instance be: respect for each other’s arguments, listening to and considering the value of arguments; and that arguments should be backed up by reason etc. What is important is that the teacher establishes the talk rules and that everyone is aware of them at all times.

## **Research methodology**

In order to answer our research questions the design of the study was inspired by action research literature (Carr and Kemmis 1986; Denzin and Lincoln 2008). What characterizes this research tradition is, for one, a certain problem or challenge that the participants want to address as the point of departure for the inquiry (Cohen, Morrison, and Manion 2000). In our case the challenge was to explore the dialogic use of IWB in the classroom and how it can be increased. A second characteristic of action research is its participatory nature; practitioners and researchers work together and influence the development of the project. Continual shared analyses of what is happening along the way may change the course of action (Cohen et al. 2000). This study was participatory in the sense that teachers were invited as co-inquirers along with the researchers, and that the observations and experiences were jointly discussed during the course of the project.

Finally, improvement in practice is always an aim of action research, as stated by Zuber-Skerritt: “... the aims of any action research project or program are to bring about practical improvement, innovation, change or development of social practice, and the practitioners’ better understanding of their practices” (cited from Cohen et al. 2000, 27).

There is, however, no agreed single understanding of what action research is, and definitions “...are re-made in local conditions, in response to local traditions and circumstances” (Kemmis 2007:11). For instance, one issue is to what extent (if any) the researchers or others should provide professional input in the process (Nes and Eriksen 2009). To support teachers - and faculty - who wish to develop practice and theory various models exist to be considered for participatory research or co-inquiry between practitioners and researchers. Examples are network learning across schools or the workshop model suggested by Hennessy et.al (2011). Our project has some similarities to these initiatives, but is not identical. However, according to Carr and Kemmis (1986) any action research model aiming to improve educational practice will include the following stages: planning, action, observation and reflection. The first two are constructive dimensions; the others are reconstructive (Steen-Olsen and Eikseth 2007). These are the four stages in our project:

1. planning: Based on theory and their own previous classroom studies (Nes and Wikan 2013), the researchers had identified the overarching research questions for the project. These questions and a brief description of the reasons for them were sent to a number of schools, along with an invitation to participate in a small co-inquiry project. The sample consisted of schools that previously had shown interest in the topic. Six teachers from three schools accepted the invitation, and a joint planning meeting was held. All the teachers were experienced users of IWB and wanted to develop their skills further. The rationale behind the project was presented and discussed in the meeting. The focus of the inquiry was the teachers’ own lessons in a chosen subject. The teachers shared their experiences so far, and through a brainstorming process, they identified subjects and topics they wanted to work with in their classes in order to increase the students’ active dialogue by the use of the IWB;
2. action: Lesson plans were worked out by the teachers and shared with the researchers. Seven innovative lessons in different subjects in the four schools were held;
3. observation: In these particular lessons, the researchers took part to observe and record the developments. Methods used were audio and video recordings, photographs and log notes. For the observations, an instrument based on the “Student Membership Snapshot” (Rivers, Ferguson, Lester, and Droegge 1995) was used. Categories for different types of learner talk were included in the instrument. In addition the teachers shared, what they had prepared as well as children’s texts saved on the IWB during the lesson etc;
4. reflection: Just after the lesson, usually a short interview with the teacher was conducted and audio taped. In the interview, spontaneous reflections about the lesson were exchanged. After the action period in all schools was finished, a joint reflection meeting with all participants was planned.

## **Findings**

Despite a small number of informants, data sources in this project were numerous. For instance, from one single lesson we would have access to a lesson plan, the teacher’s pp-presentation, her digital notebook, (links to) materials used in the lesson etc., in addition to our observation notes and audio & video recordings during and after the lesson. After analysing and comparing all data sources, main tendencies in the findings are presented and discussed below through examples.

### ***Example 1: a convenient technology***

We observed Marina teaching her class of 28 fifth grade learners in a small town. A second teacher, Ruth, was present, but she only observed. This was a multi-ethnic class and four of the



learners were relatively new immigrants to Norway. The subject was Religion and Ethics and the theme poverty and richness. Marina’s aim for the lesson was to give the learners increased insight in what it can mean to be poor or rich. The classroom setting was the teacher being in front of the room with the IWB switched on. The learners sat in groups of three with their “learning partners”. Marina started the lesson by reminding about the implications of being a “learning partner” and the “talk rules”. The teacher showed a picture of some very poor children on the IWB, and asked the learners to discuss what poverty implied. The following dialogue between three pupils is typical for the recordings from this lesson:

“Pia: Their houses are old - almost falling down  
 Mary: Yes, and they are really old and dirty  
 Pia: Maybe they do not get enough food?  
 Jenny: .... yes  
 Mary: But they do have clothes on, even though they are poor  
 Jenny: ... yes, but their clothes are not nice”.

Listening to the dialogue between these three girls revealed that they listened to each other’s arguments and partly built on it. For instance, when Marina said that they do have clothes, Jenny continued and said that the clothes are not nice and Pia reflected further, commenting that they cannot complain about the types and fashion. Together they developed an understanding that being poor is complex and has to do with lack of many things; food, good houses, nice clothes etc. This may be interpreted as an example of exploratory talk and interthinking although the children did not challenge each other’s argument. However, since they did reflect upon what the others said but lacked the critical-constructive perspective inherent of explorative talk, one could rather interpret the dialogue as a typical example of cumulative talk.

When we discussed the lesson with Marina and Ruth, they argued that firstly the rules of talk and secondly, discussions with the learning partners’ help to structure the discussion. In a class like this with different ethnic groups and some learners who are struggling with the Norwegian language, this approach is especially fruitful. The teachers claimed that their pupils became more confident and dared to express themselves in the full class after they had discussed with their learning partners. Marina explained that they had worked with talk rules for a long time. The rules are to listen to and respect others’ views and answers, and to avoid negative body language. We observed that talk rules in combination with a system of learning partners created an atmosphere where interthinking and exploratory talk could happen, and where disputational talk was rare.

We observed that Marina used the IWB as a screen to show pictures and films as well as a board to take notes of the answers and suggestions from the class. In our feedback, we asked whether she could have managed perfectly well without the IWB. Marina agreed, but she argued that to have all learning materials on one device was helpful and made the lesson proceed smoothly. The alternative would have been to change between the blackboard and a computer in order to show pictures, movies and take notes. Another advantage is that she could save everything for further use. This teacher used the IWB because of the smooth affordances of this technology, which allows her to use different modalities to motivate, stimulate talk and give information to the learners. She could have done the same without the IWB, though. It is the convenience of the technology in addition to the option it offers to save the work for later that are the main advantages of an IWB in the classroom, according to this teacher.

### ***Example 2: just a fancy board***

Lilly is a class teacher for a grade 7 class of 16 learners in a peri-urban community. We will present the maths lesson Lilly prepared and planned with the use of an IWB as an artefact to stimulate dialogue between the learners. She used the first 20 minutes of the lesson in full-class setting; she did not use the IWB. The next step was to divide the class into four groups. The groups were given different tasks to solve. The group work lasted for 30 minutes. Lastly, each group was invited to the IWB to present their solution. Group 4 - three girls and one boy - should calculate the cost total of five planks of different lengths. The following conversation took place in one of the groups:

“Ann: I think that we must start with adding the length of all planks first  
 Eva: yes, let’s do that, then we will get the total  
 Linn: No, I do not think that is the way to solve this problem  
 Linn: We must multiply each plank with the price first and then add  
 Dusan: Yes, I think that is better.”

Through this dialogue, we see that the four learners listen to each other’s arguments, and then argued for the best solution. We observed that, for instance, Ann argued for her method but in the end change her mind and went for Linn’s method. Ann and Linn seemed to be leaders and the others followed them. Eva believed that Ann’s method was best, but when Ann said OK to Linn’s method, she did not argue against it. The way both Ann and Linn argued for their own solution could have been interpreted as disputational talk, but the fact that Ann gave in and went for Linn’s solution shows that this group had an exploratory talk, they were interthinking. None of the other three groups discussed like this group. More typically, we observed that one learner decided how to solve the problem and there was no discussion. After 30 minutes each group were invited to the IWB in front of the class to present their solution. They wrote on the IWB. What we have observed here is a lack of dialogue. Each group came up in front of class, wrote their solution on the IWB and that was all. There were no discussions of solutions, few questions from the class and the teacher did not engage the group or the class in dialogue about the solution. The IWB was only used as a board to write on.

This maths lesson was an example of a lesson where it is difficult to see the usefulness of the IWB. Actually, the blackboard is better to write on than an IWB. The only reason to use the IWB could be if the teacher would like to save the work. However, she did not. During the group work, we observed that it was only in one group out of four that the participants listened to each other’s argument. One explanation for the lack of dialogue could be that Lilly had not set talk rules in her class. She had not really planned a lesson, which stimulated dialogue in the full class setting, and neither had she planned a lesson for utilizing the potential of the IWB to stimulate exploratory talk in groups.

### ***Example 3: exploratory talk in front of the IWB***

Elisabeth is a class teacher for grade 6 at a peri-urban school. She invited us to observe a lesson in social science; the theme is Drugs and Alcohol. The objective is twofold: learners shall get more information about drug and alcohol related effects both for the individual and society. Her plan was to start with brain storming to reveal what they already know. The learners were divided into groups from the start. Elisabeth first used the quiz program Kahoot to find out what they know; she used this because the learners like to quiz. Elisabeth is a strong believer in dialogical teaching and she wants the learners to talk and discuss before they answer. However, she has never set formal talk rules in her classroom.

The Kahoot quiz was prepared on the IWB with 10 questions and the four groups competed to win. We observed one group and noticed no interaction or dialogue. When the question came up, they competed to suggest the correct answer and pressed the button. Spirits, however, were high and obviously, the learners found the quiz very motivating. However, Elisabeth’s use of a quiz on the IWB did not create a milieu that stimulated dialogue in the group. On the contrary, we observed either a lack of dialogue or the presence of disputational talk - that is, they competed and did not listen to each other’s arguments. One reason could be the short time they had to come up with an answer and/or that the questions were of lower order and had clear and simple answerers. However, when they were challenged on higher order thinking, the typical dialogue below took place in the same group of four learners; they were now “interthinking”. The teacher had shown a picture on the IWB and the group was asked to combine eight blood-alcohol levels with eight descriptions of how people act when getting drunk. They must use the touch and drag options on the board.

“John: “Cannot walk without falling”  
 Peter: Maybe 0.5 o/oo  
 Eva: Yes  
 Teacher: Earlier you were allowed to drive a car with 0.5 o/oo  
 Peter: How many beers was that?”

Teacher: Three...

Peter: 0.2 o/oo

Astrid: No, I think 1.0 o/oo

John: No, not 1 o/oo. Do you remember when we were on excursion and we met that man, he drank beer, he smelt and he took only one - he only took one.

Eva: Maybe we shall say 0.5 o/oo?

Peter: Maybe

Astrid: I also go for 0.5”.

This was the first challenge presented by the teacher on the IWB that learners were not able to find a straight answer to. For the first time during the work, the group is put in a situation where they did not know the right answer, but must to reason together. They were obviously not that familiar with drinking and the influence alcohol has on the motoric and cognitive functions and was not able to match the numbers with the sentences. When Peter first suggests 0.5 o/oo Astrid agreed, but then the teacher interferes with some facts. Then Astrid suggested another number and we see that John disagreed and they continued to argue. The others then got convinced. In addition, as they worked through the task, we observed that they got more and more frustrated and they kept on changing what number went with which description.

The talks between the four learners were critical and constructive and a rare example of exploratory talk. They shared relevant information as in the example of the man they had seen taking a beer (when they were on an excursion). They also argued as well as asking each other questions and listening to other learners’ answers. They were “interthinking” but they struggled to arrive at a common result. The challenge the teacher gave them was so difficult that they had to think and reflect and they all seemed to realize that they needed each other in order to solve the problem. The quiz sequence at the start of the lesson was an example of simple and lower order questions under time stress that had another purpose.

In the example about how alcohol influences cognitive and motor control Elisabeth utilized the interactive potential of the IWB. The touch-and-drag options made it possible for the learners to discuss, end up with an answer, change their minds and move the number back and forth. The flexibility of the IWB made it easy for the learners to investigate and try out their ideas. Elisabeth had successfully planned this question and used the technology best suited to stimulating exploratory talk. She also used or allowed the learners to use the IWB during the other part of the lesson. However, as described, this did not create situations that stimulated exploratory talk. She had all the learning material prepared and loaded up on the IWB. She utilized the affordances of IWB to make her lesson flow smoothly, but only the last picture challenged the learners to discuss, reflect and listen. Mostly we saw that the IWB was used technically to stimulate activity and test knowledge. Other technologies could have been used, but the affordances of the board made it the convenient choice.

## **Conclusions and implications for teacher education**

The main research question in this study is; under which circumstances can the teacher’s use of IWB stimulate exploratory dialogue through interthinking in the classroom. We observed that the IWB technology is so flexible that it makes it possible for the teacher to create a space for investigation and dialogue, possibly more easily so than do other technologies. However, in most of our observations we did not find that the IWB was a crucial device in order to stimulate interthinking and exploratory talk. In most of the lessons, we observed the teachers had planned lessons that could stimulate interthinking. However, in most cases the IWB did not play a central or a crucial role. The cumulative and exploratory dialogue we observed came because of the problems the learners were challenged to solve, regardless of the IWB. In some instances, the teachers and learners used the IWB as a black/white board; in other cases, we observed an advanced use of the affordances and the modalities of the IWB to motivate and vary teaching, stimulating talk. Only in one lesson did we observe that the active use of the IWB was crucial in stimulating the exploratory talk. To create an IWB learning environment that stimulates exploratory talk, several factors must be present. The teacher must be careful to choose questions/problems of higher order to be able to

stimulate exploratory talk. Questions that is easy to find a correct answer to will at best stimulate cumulative talk and in the worst case disputational talk. Furthermore, the learners must be given time and training to discuss; establishing talk rules seemed very helpful in bringing about a climate of participation and dialogue. Finally, the affordances of the IWB must be utilized, for instance the touch-and-drag technology seems to be useful. When all these three factors are present we observed that the IWB was instrumental in stimulating interthinking and creating a dialogic space in the classroom. Not only the pupils, but the teachers too need training and support to be able to exploit the potential of digital devices, in this case the IWB. For instance, in Norway and in other countries teachers tend to use the computer more for lesson preparations than actually in the classroom (European Schoolnet 2013; Monitor 2013). What does it take to develop the digital classroom practices of teachers? Firstly, most initial teacher education programmes in Europe still fail to address the use of IWB in theory and practice to any extent as a compulsory part of the education if at all, a situation that has to change. Secondly, the continuing professional development of teachers must offer support for raising digital competence in a wide sense. That includes the theoretical background for teaching and learning activities, which emphasize dialogue and student involvement. However, Norwegian teachers - rather than attending courses - seem to prefer informal training through support from colleagues or through trial and error (Monitor 2013). We agree with the report that targeted professional staff development is not easily achieved with such an informal approach only.

Finally, some methodological reflections: Different models have been tried out successfully as digital innovation strategies in schools, cf for instance Hennessy et al (2011). Our approach is informed by such examples, but how successful it is, is too early to tell. The participants in the project were teachers and researchers, carrying out a co-inquiry, perhaps a new role for both parties. The role of the researchers in participatory research may be characterized by:

- Changing from observer to participant;
- Changing from a researcher expert to a learning researcher;
- Leading development processes and sharing responsibilities for solutions.)” (Steen-Olsen and Eikseth 2007:30).

A pitfall in participatory research is the asymmetry between, in this case, researchers and teachers. It is essential for the participants not only “becoming critical” (Carr and Kemmis 1986), but “staying critical” (Kemmis 2007) to power differences. For instance, even if strong commitment to develop practice was articulated by the teachers in our project, the researchers formulated the initial questions. On the other hand, the researchers did not have any advice as to “how” these questions should be pursued, while the teachers proved to have a lot to say and show for researchers and colleagues to learn from. By being two colleagues on the same project from a school, teachers can continue their exploration in a “reflective spiral” after the project is finished, perhaps involving other colleagues as well (Johns 2009). In any case, all participants must be aware that this is a long process, which should be seen as part of a continuous professional development.

## References

- Beauchamp, G. 2004. “Teacher use of the interactive whiteboard in primary schools.” *Technology, pedagogy and education* 13 (3): 327-348.
- Blau, I. 2011. “Teachers for “Smart classrooms”: the extent of implementation of an interactive whiteboard-based professional development program on elementary teachers’ instructional practices.” *Interdisciplinary Journal of E-learning and Learning Objects* 7: 275-289.
- Carr, W., and S. Kemmis. 1986. *Becoming critical*. London: Falmer Press.
- Cohen, L., K. Morrison, and L. Manion. 2000. *Research methods in education*. London: RoutledgeFalmer.
- Denzin, N., and Y. Lincoln. 2008. *Strategies of qualitative inquiry*. Los Angeles: Sage.
- Digregorio, P., and K. Sobel-Lojesk. 2009-2010. “The effects of interactive whiteboards on pupils’ performance and learning.” *Journal of Educational Technology Systems* 38 (3): 255-312.

- European Schoolnet. 2013. *Survey of schools: ICT in education*. Brussels: European Schoolnet.
- Glover, D., D. Miller, D. Averis, and V. Door. 2007. “The evolution of an effective pedagogy for teachers using the interactive whiteboard in mathematics and modern languages.” *Learning, Media and Technology* 32 (1): 5-20.
- Hennessy, S., N. Mercer, and P. Warwick. 2011. “A dialogic inquiry approach to working with teachers in developing classroom dialogue.” *Teachers College Record* 113 (9): 1906-1959.
- Howe, C., A. Tolmie, A. Thurston, K. Topping, D. Christie, K. Livingstone, E. Jessiman, and C. Donaldson. 2007. “Group work in elementary science.” *Learning and Instruction* 17 (5): 549-563.
- Johns, C. 2009. *Becoming a reflective practitioner*. Chichester: Wiley-Blackwell.
- Kemmis, S. 2007. “Action research. A Nordic perspective. Foreword.” In *Action research. A Nordic perspective*, edited by E. Furu, T. Lund, and T. Tiller, 11-18. Kristiansand: HøyskoleForlaget.
- Kershner, R., N. Mercer, N. Warwick, and K. Staarman. 2010. “Can interactive whiteboard support young children’s collaborative communication and thinking in classroom science activities?” *Computer-supported Collaborative Learning* (5): 359-383.
- Mercer, N. 2000. *Words and minds: how we use language to think together*. London: Routledge.
- Mercer, N., and K. Littleton. 2007. *Dialogue and the development of children’s thinking: a sociocultural approach*. London: Routledge.
- Mercer, N., P. Warwick, R. Kershner, and J. Staarman. 2010. “Can the interactive whiteboard help to provide “dialogic space” for children’s collaborative activity?” *Language and education* 24 (5): 367-384.
- Monitor 2013. *Monitor skole 2013. Om digital kompetanse og erfaringer med bruk av IKT i skolen*. Oslo: Senter for IKT i utdanningen.
- Nes, K., and Wikan, G. 2013. Do Norwegian primary school teachers use interactive white boards as artefacts to support dialogic learning spaces? *Seminar.net*, <http://seminar.net/index.php/volume-9-issue-2-2013>
- Nes, K., and S. Eriksen. 2009. “Ja takk, begge deler? Forskningsbasert utviklingsarbeid og/eller aksjonsforskning.” In *Skolen og elevenes forutsetninger. Om tilpasset opplæring i pedagogisk praksis og forskning*, edited by T. Nordahl and S. Dobson. Vallset: Oplandske Bokforlag.
- Rivers, E., D. Ferguson, J. Lester, and C. Droege. 1995. *Student membership snapshots. an ongoing problem-finding and problem-solving strategy*. Eugene: University of Oregon.
- Smith, F., F. Hardman, and S. Higgins. 2006. “The impact of interactive whiteboards on teacher-pupil interaction in the national literacy and numeracy strategies.” *British Educational research Journal* 32 (3): 443-457.
- Steen-Olsen, T., and A. Eikseth. 2007. “Utfordringer og dilemmaer i starten av et aksjonsforskningsprosjekt.” *Tidsskriftet FOU i praksis* 1 (1): 25-43.
- Twiner, A., C. Coffin, K. Littleton, and D. Whitelock. 2010. “Multimodality, orchestration and participation in the context of classroom use of the interactive whiteboard: a discussion.” *Technology, Pedagogy and Education* 18 (2): 211-223.
- Warwick, P., S. Hennessy, and N. Mercer. 2011. “Promoting teacher and school development through co-enquiry.” *Teachers and Teaching: Theory and practice* 17 (3): 303-324.
- Wegerif, R. 2007. *Dialogic, education and technology: expanding the space of learning*. New York: Springer.
- Wikan, G., and T. Mølster. 2010. “Norwegian secondary school teachers and ICT.” *European Journal of Teacher Education* 34 (2): 209-218.

Back to contents

## **The work context as a learning system: transferring experiences from work life to Technical and Vocational Teacher Education (TVTE)**

*Birger Brevik<sup>1</sup>, Arne Roar Lier<sup>1</sup> & Jan Wabø<sup>2</sup>*

*<sup>1</sup>Oslo and Akershus University College of Applied Sciences, <sup>2</sup>Norwegian Tax South office, Norway*

*birger.brevik@hioa.no; arneroar.lier@hioa.no & jan.wabo@skatteetaten.no*

### **Abstract**

The purpose of this paper is to present and discuss results of a study related to challenges to educate teachers for the 21<sup>st</sup> century. We have looked at the LEAN system and we ask questions about what kind of learning effects may be working for LEAN. Based on our empirical material from the Norwegian Tax South office, we have come to an understanding of LEAN and how it can provide learning transfer of knowledge from organizations outside the education system of vocational teacher education. This study has shown how we can implement LEAN in vocational teacher education. The transference of knowledge from organizations outside the educational system into teacher education, in general, and teacher education for vocational education, more specifically, poses great challenges to teacher educators and, therefore, is taken into account in the study and its discussions about teachers' identities through the life-course and how to cope with professional transitions.

**Keywords:** teacher education; technical and vocational education; work life learning; leadership; LEAN.

### **Context of the research**

This article documents collaboration between researchers on vocational teacher education and training managers in one of the Norwegian Tax Administration district office, designated as Tax South office. Cooperation was established through a common interest in learning in firms, and how the experience of learning in enterprises can be transferred to vocational teacher education (TVTE).

The study is carried out in a work context and it focuses on new leadership concepts applied in the working life and the learning that takes place in a manager's professional practice, known as LEAN, in the meaning of lean/skinny production process. LEAN can also be understood as a learning system, which corresponds to Knud Illeris' (2006, 109) model of comprehensive learning and learning in working life. Thus, the findings of the study are relevant to leadership contexts of organizations outside and inside the educational system. They are also relevant for developing our understanding of teaching and learning concepts, both inside and outside the educational system. Moreover, they will contribute to our understanding of transitions in teacher education and professional identities of educators inside and outside vocational education.

What is LEAN in Norway? LEAN is connected in Norway with “Slim production”. The definition “Slim production” is largely derived from Toyota Production System (TPS). TPS is known to seek to reduce the seven forms of waste (seven wastes) in a continuous improvement process (Womack and Jones 2003). There are different views on how the results can best be achieved.

As we understand it, LEAN can be summed up this way: “Lean is a management and business philosophy focused on creating customer value with minimum waste and errors. Fundamental respect for people, continuous improvement and various tools and methods are necessary to achieve this goal. This is based on mutual trust and respect between management and employees” (Johnstad et al. 2012, 111).

LEAN was introduced in Norway in the 1980s and gradually implemented in several organizations, including within education.

Two examples of Norwegian descriptions or definitions LEAN: “Lean is all about delivering customer value with minimal loss of resources by establishing flow and continuous improvement” (Wig 2013, 38). This description is focused primarily on “customer value”, understood that the

customer gets the right product with the right quality and price. This description is hardly relevant in our context, but is an example of how LEAN can be understood and used.

Central regulations in Norwegian workplaces are master agreement. A Master Agreement contains the basic rules of the workplace. The agreement, which is referred to as “social bible”, regulates general provisions concerning negotiation and cooperative relationship between employers and workers.

In relation to the development and use of LEAN in businesses is supplementary agreement through broad employee participation central (Johnstad et al. 2012, 122). This basic understanding of participation has been and is to form the Norwegian model of LEAN. At all levels of education in Norway, law and guidelines regulate pupils and students participation. This makes it natural to use LEAN in the training and study, and it can also be a good preparation for pupils and students to the working world.

Another definition, which is more holistic, refers to LEAN as: “a management and operating philosophy and methods, with a focus on creating customer value with minimum waste and errors through continuous improvement” (Johnstad et al. 2012, 17). This definition is rooted in management and business philosophy. It does not just focus on customer value, but it is also a justification for the management and business philosophy that we believe embraces a more holistic understanding.

In the Norwegian context, LEAN is related to all types of businesses, manufacturing and services. Eventually, public and private services will implement LEAN. This has inevitably led to LEAN being adapted to the Norwegian labour market. This adaptation is taken place in relation to the Norwegian party cooperation between management and employees. In the book that reports the Norwegian experiences with the implementation of LEAN at Raufoss Industry where Johnstad et al. (2012) refer to three dimensions of collaboration that are indicated and specified below:

- “1.The basic representative codetermination
  - Enforcement of laws and agreements
  - Handling local disagreements and negotiations
- 2.The collective direct involvement
  - Employee involvement in the operation and development
  - Organizational Learning
- 3.The extended representative collaboration
  - Local collaboration capability
  - The content of the cooperation” (Johnstad et al. 2012, 125).

To provide a better understanding of the Norwegian model with macro and micro dimensions that affect LEAN is there necessary to outline this model. The macro level includes the Master Agreement and tripartite cooperation. They further state that, “This is the national framework for the micro, which is part of the formal aspect of a business that demands and opens opportunities for cooperation” (Johnstad et al. 2012, 125). The concrete that happens at the micro level is based on the macro level as it relates to the basic agreement and the tripartite that is justified by the fact that: “... we have the broad and collective direct participation in the form of employee” (125).

Involvement in the operation, development and training: The micro level is the distinctive feature and that is the basis for the Norwegian model. This way of working will be fundamental in how LEAN can be learned and used in the training of vocational teachers in Norway.

Its importance for vocational education in Norway has been increasing, and it is expected that students who are apprentices or being offered jobs will have, in general, a basic understanding of LEAN. A corollary is that this is a central theme in our bachelor degree programs related to technology subjects in vocational teacher education at Norwegian universities and colleges. Although LEAN is relevant for vocational teacher training, it is relevant also for other professional programs.

## **Theoretical framework**

We have chosen to use a case from the organization Tax South office. Although Tax South office is not a technology business directly, they have a professional and thorough grounding in how LEAN is used by their leaders. The relevance of vocational teacher as leader, we will therefore be able to see connections in the Tax South office LEAN experience. In the Norwegian Tax administration, which Tax South office is part, has described their own understanding of LEAN, named as constant improvement (CI) (Norwegian: KF), understood as constant improvement (Skatteetaten 2012).

Our partner in the Tax South office has his master degree from our department. This means that we have a mutual understanding of the vocational education field. We therefore write this article together to develop each other's understanding of LEAN general. Primarily, this article will be centred on how the experience of Tax South office with LEAN can be embedded in our vocational teacher training in technology subjects.

The study aims to increase understanding of Lean, as a problem solving working method, and also as a way of learning. To address these questions, the study was conducted at Tax office, which has a well-established LEAN system, from top management down to production. The purpose is to examine LEAN practices and their implications for the improvement, development and organizational learning. The method is based on the collection of quantitative and qualitative data. Quantitative data will be sent to analysis of variance and the qualitative data will be analysed by a constant comparative method derived from Grounded Theory. Based on the results of the case study with Tax South office, we want to discuss issues such as: Is LEAN a mode of working? Is it a problem solving method? Can LEAN be a learning arena and, if so, what kind of learning is it? What experience from LEAN social context can be transferred to the study program?

How can experiences from a leadership-training program in LEAN in Tax South office be a model for LEAN training in a Norwegian study program? To answer this question, his article has been divided in two parts. In the first part we present results from a survey among managers in Tax office office, and, next, we discuss how these results can be used as a basis for the development of vocational teacher education in Norway.

### ***Vocational Pedagogy***

Vocational Pedagogy can be described as a pedagogy that includes and is rooted in work tasks; work processes and production processes in the profession students are trained to. Vocational pedagogy's role is to promote and articulate tasks and processes occupations, within which the professionals are trained to perform, and document, systematize, discuss and reflect on the tasks and processes (HiAk 2011). Furthermore, the vocational teaching work, management and organization of vocational learning. The term vocational pedagogy therefore includes both schools and working life work on education (Brevik 2014).

### ***Vocational didactics***

In the context from Europe didactics can be described in three key levels: the level of research, the practical level and the discussion level (Gundem 2011, 23). In this context, the research level can be described to include study and research field and its research texts, while the practical level is described as teachers work with teaching. The last of these three levels, the level of discussion can be like Hopmann and Riquartz description as a dialogue between teachers, and between teachers and others outside the school regarding conditions in the school context (as quoted in Gundem 2011, 23). This study deals with the dialogue between teacher educators and employees of the Norwegian Tax South office.

Vocational Didactics can, in the same way as the general description of Didactics above, be described as a term that is mainly in teacher education in general and particularly in vocational teacher education. In addition to the use of Vocational Didactics in the school context, the term also includes training in business and interaction between schools and business. The term can therefore be defined as follows:



“Vocational Didactics includes planning, implementation and evaluation of structured job-specific learning progress in school and business- based on relevant tasks implied in the organizational and social context- and how the learner as subject is involved in the entire process.” (Sannerud 2005, 211).

Sannerud defines the term Vocational Didactics in a comprehensive way in which he draws in relevant tasks and the learner as subject involved in the entire process. However, we emphasize that one should not make businesses into schools, or schools into businesses but let the school learning tasks has its roots in business work processes.

### ***Technical and Vocational Teacher Education in Norway (TVTE)***

Vocational Teacher Education consists of a Bachelor degree with a normal duration of three years (Brevik and Lier 2013). The admission requirements demand that the student has a craft or journeyman’s certificate. In addition, the applicant must have two-year experience in the subject after passing academic examinations. In addition, the person must have matriculation or equivalent qualification. From August 2014 takes colleges and universities in Norway introduced a new curriculum for vocational teacher training that clarifies the program’s content.

### **Research methodology**

The survey was designed by Wabø and his colleagues at Tax South office as an evaluation of a training program for managers and designed as a survey with a quantitative and a qualitative part. The quantitative part of the survey is analysed by Wabø and his colleague, while the analyses of the qualitative part of the survey is conducted by both researchers Brevik and Lier, referred as The researchers’ understanding, and Wabø and his colleague, referred as Practice field’s understanding. In this article it is mainly the analyses of the qualitative part of the survey that are presented and discussed.

#### ***Quantitative part of the study***

The survey was designed with questions within topics about Leader Behaviour, Use of process development methodology, Management, Employee Cabinets, “Esprit de Corps” and Transfer of Authority to the line. The sample consists of a total of 41 respondents. The whole group consists of three department directors, six Section Managers (Head of sections) and 32 Managers (sub directors) in the Norwegian Tax South office. In addition to the 18 quantitative questions the questionnaire allowed the respondents to make general comments regarding leader behaviours. There was a final open question for the informants to give a general feedback. While the responses to the two open questions aroused most interest among researchers, the practice field found the quantitative part of the study most relevant to their report. For this reason this study is based on analyses of quantitative data, with a subsequent emphasis on the qualitative analysis of responses given to the open questions.

#### ***Qualitative part of the study***

The qualitative data is as described above obtained via a questionnaire in which nine of the 41 respondents provided comments to the subject leader behaviours, and 19 of 41 informants made general comments that relate to the study’s theme. Since six of the respondents gave us comment on the question of the subject leader behaviours and general feedback, it means that we have received comments from a total of 22 of the 41 respondents. Although we have 22 respondents who have given us their commentary, we have chosen to analyse the data qualitatively based on Grounded Theory with open, axial and selective coding (Charmaz 2014), and do not quantify the results.

To get the research field’s understanding of the qualitative data selection we let two representatives from the Norwegian Tax South office (Wabø and his colleague), analyse the material under the guidance of the researchers. Prior to this work (the day before) the researchers had (Brevik and Lier) analysed the same data and drawn their understanding. This work resulted in

two different results on models, presented in this paper, respectively, as practice field's understanding and the researchers' understanding.

The actual implementation of the analyses was performed both days in the same way. First we went through all the statements line by line, and categorized their meanings (open coding). Then we grouped the generated code and found the correlation between these (axial coding), until we found the overall categories representing the survey results (selective coding). To assist in this process we used Atlas.ti which is a software for qualitative analysis (Friese 2011; Muhr 2001).

## Findings

The results of our study are described in two reports. One report, based mainly on the quantitative part of the study (Figure 1), acts as an internal document for managing the continuing process of leadership training in the Norwegian Tax South office. The second report, this paper, has a completely different audience, namely the professional field of educational research.

	Department Director	Head of Section	Sub Director
<b>3.1 To what extent have the CI-training in Phase 2 contributed to that in Phase 3 focuses on leadership principles?</b>			
Total	3 100,0%	7 100,0%	33 100,0%
Average	3,0	3,3	3,7
<b>3.2 To what extent has the CI-training in Phase 2 has helped to focus attention on employee ownership in your department, section or group?</b>			
Average	3,3	4,0	3,6
<b>3.3   To what extent has the CI-training in Phase 2 have helped to focus attention on the teamwork in your department, section or group?</b>			
Average	3,3	3,6	3,7
<b>3.4 To what extent do you believe that the goals of the CI program are reached in your department, section or group?</b>			
Average	3,0	3,4	3,4

Figure 1. Example of results from the quantitative part of the study

### *Discussion of result from the survey*

Informants answered in scale of 1 to 5 where 1: is a small degree, 3: to some degree and 5: is significantly. With reply from three to 33 informants in the three different groups, and with average response value between 3.0 and 4.0, it turned out that the results of the quantitative part of the study did not give us the insight we were looking for. Thus we decided make an in-depth analysis of the qualitative part of the study.

### *Findings from the Practice field's understanding*

As illustrated in Figure 2, revealed analyses three main categories. The presentation will therefore be structured with these three categories as headings.

#### *Organizational levels*

Leaders should go ahead and show the way. Our findings show that the organization is very important to get LEAN to work. Organization leaders are those that carry out working methods that are within Lean. Good LEAN program seems to lead to good references and examples of a LEAN

program that leads to learning and collaboration across the organization. In our material, we see that the employees belonging to an organizational unit with its leaders work based on organizational learning. Organizational learning brings to in the methodical use of blackboard meetings and PS sheets (PS: Problem Solving).

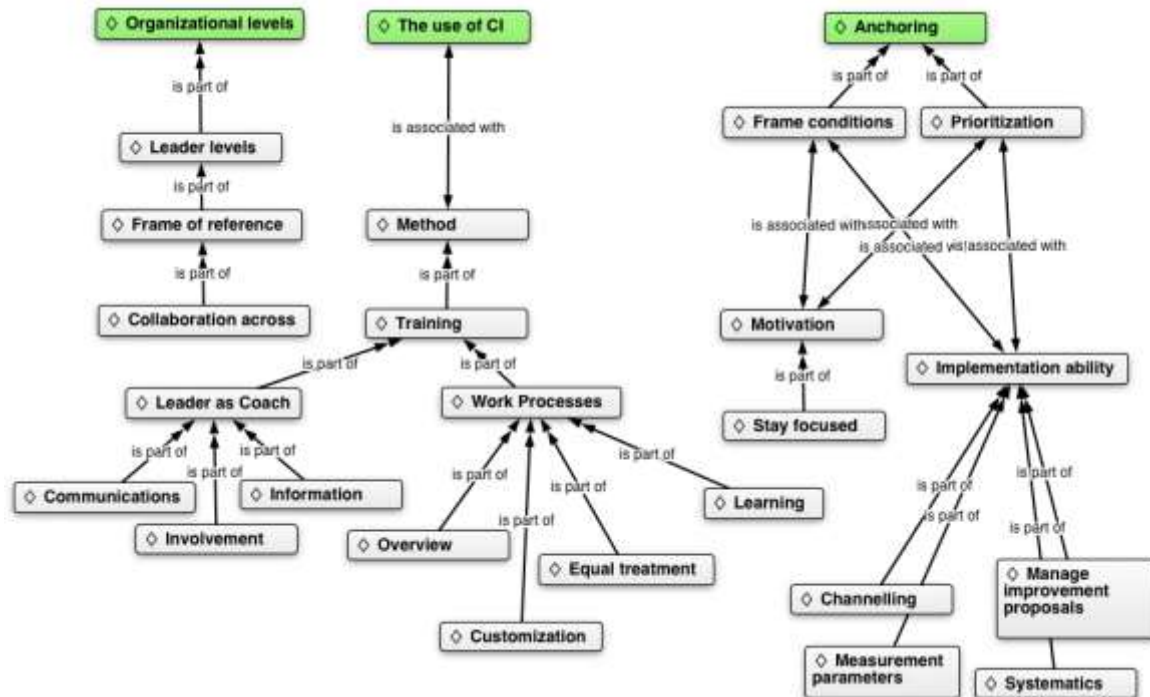


Figure 2. Practice field's understanding

### *Application of LEAN (The use of CI)*

Through the application of CI (CI: constant improvement) methods we see in the material that this may be a form of double circuit learning, where one in LEAN terminology look at the root cause which is to say not only look at the effect of a measure, single circuit learning, but also look at the reason for a phenomenon to occur. To become good at whiteboard meetings, “singular circuit learning” and use of problem solving sheets (PS), double circuit learning, use a coaching leadership style that involves focusing on communication, information and relationship.

### *Anchoring*

Anchoring is part of the overall picture of how they work with LEAN in daily work. On framework conditions, which in this context means resources to pursue LEAN principles. The framework also leads to that there is a focus on priorities.

### ***Findings from the researchers “understanding”***

It is not so much the similarities between the Practice field's understanding (Figure 2.) and the researchers “understanding” (Figure 3.), but we have some interesting findings in relation to the study topic. The participants in the practice field have a more practical approach as shown in the reports, while scientists have a more general perspective on what is happening in the field.

An example of the differences between these two analyses of the same data is the category method. We as researchers associate method with didactics, which again is associated with teaching and learning as an overarching category. As subcategories of method we have chosen tools, exercises and exemplary learning. Practice Field on its side associate method directly against LEAN, specifically here as The use of CI, and places category Training as part of the method.

Training reconnected with concepts like Leader as Coach and Work Processes, each with their underlying categories.

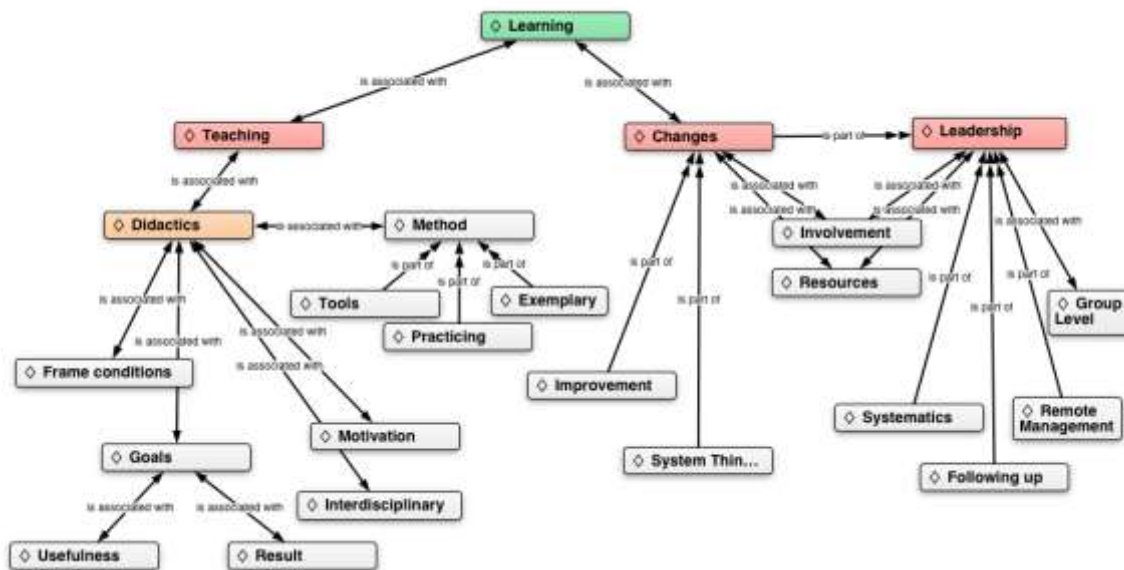


Figure 3. The researchers' understanding

This shows that we as researchers and educators have a different conceptual framework in relation to the practice field, which has a different understanding, aimed directly at their own practice.

#### *How can this difference be explained?*

Postholm and Moen (2009, 50) present a model for research and development activities in three levels or plateau: The development process, reflection, research plateau and Meta perspective on practice. In these understanding the, LEAN at the Norwegian Tax South office, can be placed on the level of the development process, and the researchers' understanding on the meta-plateau. We can also explain these differences when we consider the three key levels didactics: the level of research, the practical level and the discussion level (Gundem 2011, 23). By this we can explain the differences in different result form analysing of the same empirical material.

#### **Discussion**

We thus justifying the difference between the practice field's understanding of the context and the researchers' understanding that they operate at different levels of insight. Both have their own intrinsic values, but differ on the focus and goals.

Practice field's understanding: Here they have reflected on their own practice, but cannot say much more than the context that is examined. The researchers' understanding: Our goal as researchers is to find a transfer value from the examined practice field to other fields. Illeris (2012, 40) understanding of learning can be described two processes: Interaction process and Acquisition process. These are ways of understanding relationships, which can be transferred to TVTE. Our findings show that this can serve as a learning process in the workplace, and therefore transferable to TVTE.

We have earlier in the paper asked the following research questions: Is there a working method? Is there a problem solving method? Is there a way to learn? Can LEAN be learned in schools and in the academic context?

#### *Task*

How can experiences from a leadership-training program in LEAN at Tax South office be a

model for LEAN training in a Norwegian study program? Moxnes (1981, 56-57) says the following about organizational learning:

“All individual members of the organization can learn, but only when learning emerge in the organization in such a way that it also becomes a guideline for organization members’ recent actions, we can talk about organizational learning. If this process is not happening, the members of the organization might have learned, but the organization has not learned”.

We argue therefore that the LEAN method can also be a form of learning. Learning approach that appears to be relevant is organizational learning, which is proposed by Argyris as the concepts of “single loop learning and double-loop learning”.

LEAN can act as organizational learning and individual learning. The conditions for being a learning organization, according to Argyris’s (1977) Theory of Action, require that the concepts of “single loop learning and double-loop learning”. Single loop and double loop learning (Argyris 1976) is a form of learning that can make LEAN work to a form of learning. Single loop - and double loop learning occurs when the organization spends time focusing on the consequences of actions in their own organization and corrects behaviour as members see the consequences of their own actions.

By single loop learning incorrectly corrected without questioned the underlying values that underlie behaviour (Argyris and Schön 1978). By double loop learning, however, an assessment of the values that underlie the behaviour before the behaviour is corrected. In our empirical material, we see that LEAN takes place in defined organizations in Tax South office.

Argyris and Schön (1978, 26-28) developed also another step called “Deutero-learning”, developed from the “single loop”- and “double-loop learning. In this paper we will not describe “Deutero-learning”, because we do not have any empirical data in our material to illuminate and discuss this form of learning.

If we use examples from board meetings of Tax South office, they help to focus on current issues. As one of Tax South’ office leaders puts it: “At a quarter to 20 minutes are reviewed last week's activities and results, what problems/challenges we had and how we can improve this week's activities/production”. The limits for board meetings give little opportunity for in-depth causal analysis. Participants correct errors and improve without necessarily going to the cause. This example we believe is a form of organizational learning that corresponds to a single-loop learning.

Another practice used by Tax South office is called PS (Problem Solving) process (PS-sheets), which is employed to work thoroughly with end root cause analysis in order to identify the underlying root causes of the problem occurred, and develop measures to eliminate the challenge. This can be, both, challenges identified in board meetings and in process mapping meetings. Often identified queues in various administrative processes for the combination process mapping and subsequent problem solving process.

An example of a PS process was completed after it was determined to remove/block of 32 fax machines/lines in Tax South office who contributed to the important inquiry was not handled. This happened because no one had been responsible for capturing requests from fax. Tax South office. After a PS process was the cause analysed and it was found a professionally satisfactory solution is that now only a fax number included in mail system and monitored continuously. This work learning process has elements that suggest that there may be a double-loop learning. It’s not bar a deviation to be corrected, but goes beyond looking at the root cause or the values Argyris says.

## **Conclusions and implications for teacher education**

### ***Conclusions***

LEAN is a working method? Is there a problem solving method? Can LEAN be a learning arena and what kind of learning is it? What experience from the LEAN social context can be transferred to the study program?

Based on the empirical material we can answer yes to the question. Vilhelm Aubert

describing method as: “A method is a method, a means to solve problems and reach new knowledge. Any agent that serves this purpose belongs to the arsenal methods” (as quoted in Dalland 2012, 111). When we connect this to work, we can understand that LEAN is a process associated with the work.

For question two, there is a problem solving method? In relation to the examples using the boards, we can see that the board meetings are used to solve problems through a methodical approach.

### ***Implications and Challenges***

#### *Can LEAN be a learning arena and what kind of learning is it?*

Initially we maintain that LEAN is an organizational learning and can be based on individual learning circuit and double circuit learning. This is essential to be able to describe how LEAN lessons from the Tax south can be used to construct a model of how LEAN can be established in the bachelor program for vocational teachers.

If we look at our data some are described in the survey, we see that the material shows that the organization and organizational levels is focused. In the bachelor study the organization of management levels is a key foundation. Lean is an organizational form that must appear among the teachers in the first place. The teaching team must adopt tablet meetings and use PS processes and be aware of single loop learning and double loop learning and use these forms of learning actively. This is called Tax south office anchorage and it is based on their material. This is vital to get LEAN to work as intended. The intention of the teaching team in bachelor study is to be exemplary in the use of LEAN to students.

We define learning in LEAN as organizational learning. The question is how we can transfer this to the vocational student teachers? Normally, in the classroom, the students are organized in basic groups that consist of four to six students. This organizational form can be used to apply LEAN as an approach to solving challenges using whiteboard meetings and PS processes. University College teachers’ role will be to act as process advisors with the goal that students will learn to use LEAN as intended.

### ***Future work***

From the starting point of our problem and through our empirical material we can show that LEAN can be a learning arena. By using Argyris’s single and double loop model we can see that learning can be carried out according to the LEAN model to achieve task improvement. The experience gained will be useful to argue for implementing LEAN in our bachelor studies in vocational teacher education. For developing an understanding LEAN “LEAN house” for use in TVTE, is it necessary to outline an own model of LEAN. Form further implementing this understanding through the teaching of these student teachers. For this, we intend to use a technological learning workshop and simulate the work processes from the life of work.

### **References**

- Argyris, C. 1976. “Single-loop and double-loop models in research on decision making.” *Administrative Science Quarterly* 21 (3): 363-375.
- Argyris, C. 1977. “Double loop learning in organizations.” *Harvard business review* 55 (5): 115-125.
- Argyris, C, and D. Schön. 1978. *Organizational learning: a theory of action perspective*. Reading, Mass.: Addison-Wesley.
- Brevik, B. 2014. “LEGO & læring: en kvalitativ studie av elektrofaglæreres bruk av LEGO Mindstorms som læringsverktøy i norsk videregående skole.” PhD diss., University of Oslo.
- Brevik, B., and A. Roar Lier. 2013. “Technical and vocational teacher education practice: profession or semi profession?” In *Proceedings of the 37th Annual Conference of ATEE: Teacher*

- Education Policies and Professionalisation*, edited by E. Agaoglu, C. Terzi, C. Kavrayici, D. Ayduğ, and B. Himmetoglu, 102-109. Brussels: ATEE aisbl.
- Charmaz, K. 2014. *Constructing Grounded Theory*. 2nd ed. London: SAGE.
- Dalland, O. 2012. *Metode og oppgaveskriving* 5th ed. Oslo: Gyldendal Akademisk.
- Friese, Su. 2011. *ATLAS.ti 6: user guide and reference*. Berlin: ATLAS.ti Scientific Software Development GmbH.
- Gundem, B. 2011. *Europeisk didaktikk: tenkning og viten*. Oslo: Universitetsforlaget.
- HiAk. 2011. *Studieplan for nasterstudium i yrkespedagogikk*. Kjeller: Høgskolen i Akershus.
- Illeris, K. 2006. *Læring*. 2 ed. Roskilde: Roskilde Universitetsforlag.
- Illeris, K. 2012. “Læringsteoriens elementer - hvordan henger det hele sammen?” In *49 tekster om læring*, edited by K. Illeris. Fredriksberg: Samfundslitteratur.
- Johnstad, T., T. Giæver, H. Holtskog, and T. Strand. 2012. *Lean på norsk: med erfaringer fra raufoss-industrien*. Vallset: Oplandske bokforlag.
- Moxnes, P. 1981. *Læring og ressursutvikling i arbeidsmiljøet: pedagogisk arbeidslivspsykologi i forskning og praksis*. Oslo: Institutt for Sosialvitenskap.
- Muhr, T. 2001. ATLAS.ti: the knowledge workbench. Scientific Software Development.
- Postholm, M., and T. Moen. 2009. *Forsknings- og utviklingsarbeid i skolen: metodebok for lærere, studenter og forskere*. Oslo: Universitetsforl.
- Sannerud, R. 2005. “Læring på byggeplassen: utopi eller realitet?”. PhD diss., Roskilde Universitetscenter.
- Skatteetaten, ed. 2012. *Introduksjon til kontinuerlig forbedring i Skatteetaten*. Oslo: Skattedirektoratet.
- Wig, B. 2013. *Lean: ledelse for lærende organisasjoner*. Oslo: Gyldendal Norsk Forlag AS.
- Womack, J., and D. Jones. 2003. *Lean thinking: banish waste and create wealth in your corporation, revised and updated* 2ed. London: Productivity Press.

[Back to contents](#)

## **Impact of business education teacher programme on the twenty-first centuries’ teaching challenges in Nigeria**

*Udeme Isaac Akpan*

*Federal College of Education Omoku, Nigeria*

udemeikpo2009@gmail.com

### **Abstract**

The study examined the impact of business education teacher programme on the twenty-first century teaching challenges in Nigeria. Three research questions were posed to guide the investigation. Roger’s theory of experiential learning was found relevant and reviewed accordingly. One thousand five hundred student teachers from colleges of education in Nigeria constituted the population of the study, 306 were randomly selected as sample. Survey instrument was developed by the researcher and was used for data collection. Data obtained were analysed using mean and standard deviation. The result of the study revealed that business education teacher programme has not impacted significantly on the twenty-first century teaching in terms of application of new instructional technologies, and the skills required in the knowledge-based economy. This implies that the policies of business education teacher programme should be reviewed to include contents and materials of new technologies which will enhance effective training.

**Keywords:** business education; student-teacher; teacher education programme; ICT.

### **Context of the research**

The world is changing socially, economically and politically, so is the school, and so has what is meant by teaching and learning. The teacher-student relationship and teaching challenges are far more complex and demanding than ever before. The implication of this more diversified role for the teacher is what impelled a new view of the process of teacher education and training. Thus, teacher education is seen as a continuous process, beginning with a phase of initial training and continuing throughout the teacher’s professional life, and throughout regular and sustained periods of in-service training. In a specific term business education teacher programme refers to the policies and procedures designed with specific objectives to equip prospective teachers with the knowledge, attitudes, behaviours and skills required to perform their tasks effectively in the classroom. The emphases of the twenty-first century teaching challenge was acquiring skills in programming (content and material) and developing computer-assisted instruction, later, the focus shifted to educational use of computers and network systems in schools. It is important to note that teacher education programme is designed based on the needs of the society which “culture” is an element, it is a fact that globalization has not influenced some cultures which involves promoting life-style, consumption, products and identities. Therefore, it is obvious that the traditional method of training teachers still dominates the educational system in Nigeria. Okoro (2000) viewed teacher education programme to lack the necessary coordination with both the existing curriculum and the realities of the classroom which creates new challenge for teacher education and continuing professional developments. The curriculums need to maintain a safe environment for the learners and learning opportunities for experience. The author recommended computer assisted programme to be integrated into the curriculum so that the curriculum can offer a balance with the realities of the classroom. Mentoring programme and peer network were also supportive measures. Therefore, there is need for flexible and interactive teacher programme to breach the gap between theory and practice in education.

According to UNESCO (2005) teacher education programme addresses environmental, social and economic contexts to create locally relevant and culturally appropriate teacher education programme for both pre-service and in-service teacher. Moon (2010) noted that teacher education programme generally includes four elements: improving the general educational background of the



teachers; increasing their knowledge and understanding of the subjects they are to teach; pedagogy and understanding of children and learning; and development of practical skills and competencies (128). Conrad and TrainingLinks (2007) noted that for more individualized learning experience, online training courses are recommended for teacher programme, some courses offer learners the option to develop their own learning objectives and to select course content based on those objectives. The standardized format for the online teacher training courses must be adapted so that each course can meet the different learning needs of the individual student-teacher. To this end, this research work is based on Roger’s 1969 theory of experiential learning.

### **Research questions**

The purpose of the study sought answers for the following questions: 1) What are the impacts of business education teacher programme on the use of technologies as a twenty-first century teaching challenge in Nigeria? 2) What are the impacts of business education teacher programme on teacher communication skill as a twenty-first century teaching challenge in Nigeria? 3) What are the impacts of business education teacher programme on students- individualized learning as a twenty-first century teaching challenge in Nigeria?

### **Theoretical framework**

While conducting this study, Roger (1969) theory on experiential learning was utilized and analysed for a better understanding if the teacher education programme has an impact of the twenty-first century teaching. Roger’s distinguished two types of learning: cognitive (meaningless) and experiential (significant). The former corresponds to academic knowledge such as learning vocabulary or multiplication tables and the latter refers to applied knowledge such as learning about engines in order to repair a car. The key to the distinction is that experiential learning addresses the needs and wants of the learner. The author listed the qualities of experiential learning such as: personal involvement, self-initiated, evaluation by learner, and pervasive effects on learner. Roger’s experiential learning is equivalent to personal change and growth, the theorist felt that all human beings have a natural propensity to learn; the role of the teacher is to facilitate such learning which includes: setting of positive climate for learning, clarifying the purposes of the learner, organising and making available learning resources, balancing intellectual and emotional components of learning, and sharing feelings and thoughts with learners and not dominating.

Roger’s theory was found relevant to business education teacher programme because the two principles centred on: it is primarily based upon direct confrontation with practical, social, personal and research problems; the student participates fully in the learning process and has control over its nature and direction; and self-evaluation is the principal method of assessing progress or success.

Therefore, it is logical to review the concept of business education and business education teacher programme.

### ***Concept of business education and business education teacher programme***

The Nigeria’s National Policy on Education (2004) stated that business education programme is a medium by which people can acquire skills such as office skills, business skills (entrepreneurial skill) and teaching skills; this programme is based on the needs and wants of the learner. Ademola (2000) viewed business education as a programme of study which offers student-teachers who wish to pursue a career in business or teaching, it is a programme with opportunities to develop talents, skills, abilities and understanding that will enable them to enter, perform and progress in an occupation after graduation from higher school. The issue of: - what knowledge, attitudes, behaviours and skills should the teacher possess is a serious twenty-first century teaching challenges as the issue of culture influences the curriculum and concept of globalization. This is better understood as the teacher is entrusted with the responsibility of transmission to learners - the society’s beliefs, attitudes and deontology, as well as of information, counselling and facilitating learner’s acquisition of the key knowledge, attitudes and behaviours that they will need to be active

and relevant in the knowledge-based economy.

Olakulehin (2007) noted that globalization has increased the presence of corporation and branding of teacher education programme; this is with a view of the changes and innovations that have taken place in the formal setting of educational system. Noting that globalization involves the dissemination of new technologies which has a tremendous impact on the teacher training programme (modern global instruction method like the use of computer assisted instruction). Cohen, Manion, and Morrison (2003) observed that teacher education programme enables teachers to become highly qualified by: improving, increasing and advancing their knowledge through better understanding of effective application of instructional strategies. To further improve teacher’s quality and knowledge, information and communication technology (ICT) in its full operational base should be integrated into the programme; this will enhance the effectiveness of information presented to teachers and it will stimulate interest using various multimedia technologies and internet. This implies that the integration of computer education into teacher education programme will enhance efficient preparation of teachers for the twenty-first century teaching challenges. Nwosu (2009) opined that online education is an innovative form of distance education that delivers instruction to a remote audience, using computer networks as the main medium... it is a method of teaching learning. Ofojebe (2006) noted that educational technology is basically the process of communication between the teacher, instructional tools and the student while the subsequent feedback should signify understanding... This means that the teacher in tomorrow’s class must acquire reading, writing, and communication skills to explore and discover new technological capabilities

In the writings of Mark (2010) teacher education programme should be designed and packaged such that: it will respond and guide student-centred learning, meet individual needs, meet the global process of learning (online/distant learning). When individualized method of learning is introduced into the system and all its elements are present, the issue of evaluation becomes an easy task; and teachers will have enough time to take care of individual learning needs. Jegede and Taplin (2000) observed that teacher education programme is driving to a point where lessons delivery through modern equipment is student-centred and the teacher is seen as a facilitator to a teaching programme of instruction through computer assisted instruction (87). The challenge is the implementation and creative use of this equipment. Without a good design of instruction, appropriate learner support services and continuous staff development and evaluation; the potential benefits of ICTs may not be achieved. Studies have shown that online education produce learning outcomes equal or greater to those of conventional face-to-face education, if it employs appropriate techniques and skills in the design and implementation of its media-mediated learning modules.

Ashby, Hobson, Tracey, Malderez, Tomlinson, Roper, and Healy (2008) noted that the concept of teacher education curriculum is generally based on the following major areas:

- foundational knowledge in education-related aspects of philosophy of education, history of education, educational psychology, and sociology of education;
- skills in assessing students learning, using technology to improve teaching and learning;
- content-area and methods, knowledge and skills emphasis is on “transversal” or “horizontal” skills (such as “learning to learn” or “social competences” which cut across traditional subject boundaries, and therefore calls for traditional ways of designing the teacher education curriculum and traditional school curricula and ways of working in the classroom);
- practice at classroom teaching-e.g field observation, student teaching practice, or the use of a computer.

Emphasis is on the third and fourth subheadings which deal on teacher’s skills and highlights of communication flow between the teacher-student and teaching aids. Ineffective communication between teacher and student will impose a challenge which will hinder teaching learning process. Olakulehin (2007) noted that communication in teacher education programme is the interaction between teacher, student and teaching aids. Therefore teacher programme should be rich enough with communication tutorials which will prepare the would-be teacher with the required skills to

communicate with the student and the modern teaching facilities (communication enhances teacher professional identity). The communication devices used within the classroom include: chalk board and its accessories, overhead projector, different types of instructional materials based on the lesson and its content, video tape, television, audio CD and DVD, computer and its relevant software. This implies that teachers should be exposed to different communication device with modern teaching facilities required for the twenty-first century teaching. Bottilno (2004) stated that the interaction between teacher-student-teaching aids enhances effective teacher communication skill therefore; the teacher education policy must emphasis communication skill (212). According to, Sarah and Stacey (2000) observed the inadequacies in teacher education programme which may create communication gap which will render the teacher ineffective and inefficient in classroom management and content delivery which involve using signs, symbols, art, movement or language to communicate and express views and ideas to a learner with different background, views, opinion, interest, values and beliefs (229).

### ***Twenty-first century teaching challenges in Nigeria***

There are several issues that have imposed challenges to teaching, this paper views some of the challenges based on the educational setting in Nigeria:

- the challenge of technology: Grof and Mouza (2008) this involves using the available technologies to learning and to teach using minimal technologies. The issues are: are there adequate / available recommended technologies, facilities, tools, software and modern gadgets for effective teaching? Are all the teacher education institutions well equipped with computers, interaction boards, overhead projectors, computers with necessary softwares? Are there available trained technicians to maintain and operate these gadgets while teaching is taking place? What about those teachers who had their training before the advent of computer and internet? Are there internet based library in school? Based on Roger’s theory of experiential learning, is the Nigeria system of teacher education really impacting enough to the would-be teachers? (25);
- individualized learning: Eze and Mutelo (2001) observed that individualized learning in the twenty-first century imposes a challenge to the school system therefore, there is need to equip teachers with the required skills. Research and case studies have shown that online training via internet provides an opportunity to develop new learning experience for learners by managing self-directed learning, and sharing information and ideas in a cooperative and collaborative manner. The primary goal of student-centered classrooms is to help students become independent but the realities are not achieved due to the traditional teaching method, inadequate training, learning environment, resources, tools and availability of facilities;
- the Challenge of Differentiation: classes are made up of students with different learning capabilities, attitude, interest, skills and knowledge. For this reasons teachers face the challenge of not meeting the variety of needs they are been confronted with. Darling-Hammond and Bransford (2005) noted that teachers facilitate a variety of learning opportunities, experiential, and holistic activities during class activities, therefore, the teacher should design modalities for assessing student performance, the author viewed individualised learning as a better approach to effective evaluation of student performance;
- the Challenge of Assessment: The challenge is in selecting appropriate assessment format/tools which allow students to best present what they know. This challenge relates to the planning and programming phase of the policy which states the method of teaching, instructional materials and evaluation. Jones (2007) opined that a teacher who comes in contact with the learner, who constantly store information about the student they teach, and improve their learning opportunities is in a better position to design assessment format and write a report which will give a more accurate overview of student performance which determines grades with a greater level of objectiveness. Therefore, a standardised format for assessment does not take into cognisance the individual learning capabilities;

- the Challenge of Planning and Programming: for the purpose of uniformity a learning programme known as curriculum is designed for every subjects, it is a guide for teaching and learning. The challenge is in the procedure, implementation and standardization. Teachers should have control creating new learning experiences that are flexible considering the present level of technology; and not depending 100% on the curriculum plan which takes 3-5years before review is made;
- the Challenge of time Management: There are numerous demands made on a teacher’s time each and every day; from planning lesson and units, marking student work, computing student results, performing administrative task, meetings in professional learning teams, counselling students, taking of complaint and meeting individual differences. Alexander and Winne (2006) noted that the last century teachers responsibility have increased significantly. The authors highlights this phenomenon calling it the ‘ever increasing burden of America’s Public Schools’ Things that were once deemed a parent’s responsibility to teach their children at home are now the school’s responsibility. All these increased responsibilities have come without a significant increase in the length of the school day or the school year, this implies that teachers are overloaded and are expected to do more with less time which may result to inefficiency and ineffectiveness;
- the Challenge of Funding: School finance has a significant impact on a teacher’s ability to maximize their effectiveness. Issues such as technology, modern instructional materials, class size, and inflexibility of a curriculum, facilities, comfortable study environment, quality learning and suitable content software/programming are affected by funding. Teachers understand that this is completely out of their control and they try to adapt to the working conditions available. The challenge of funding has led to the suspension of Technical Teacher Training Programme (TTTP), this imposes a negative impact on the twenty-first century teaching. Cohen, Manion, and Morrison (2003) opined that government investing sufficient funds into the education system by process of implementing teacher education programme to its fullest; equipping all the schools with modern instructional materials such as computer to the ratio of students in the class, sponsoring teachers on developmental study on ICT, further re-training of teachers, and replacing existing facilities with modern gadgets will prepare the educational system and the teacher for the twenty-first century teaching challenges.

### **Research methodology**

The survey research design was used to identify and seek opinion from a large number of student-teachers of colleges of education in south south geo-political zone of Nigeria. The population of the study was clustered based on the institutions selected for the study. Each of the clusters had 500 student-teachers which 102 were randomly selected from each of the clusters. A sample size of 306 was obtained (Krejcie and Morgan 1970) Population Table. The institutions selected for the study were Federal college of education Obudu- Cross River State, Federal college of education Omoku- Rivers State, and Akwa Ibom State college of education Afaha Nsit,. The elements in the population were the entire student-teachers.

A survey instrument was developed by the researcher and titled: Teacher Education Programme and the twenty-first Century Teaching Challenges Questionnaire (TEPCTCQ). The instrument comprised 15 items structured in a 4 point rating scale as follows: Very Great Extent (VGE) = 4 points, Great Extent (GE) = 3 points, Some Extent (SE) = 2 points, Not at All (NA) = 1 point. The TEPCTCQ was vetted by an expert to ensure face validity. The instrument was administered to 40 student teachers who did not take part in the main study. Their scores were subjected to Cronbach’s alpha test to determine the reliability index of the instrument. The test yielded reliability co-efficient of .78%. The instrument was then administered to the respondents by the researcher and two field assistants. Completed copies were retrieved for data analysis.

## Findings

Of the 310 copies of the instrument administered to the respondents 306 were retrieved with valid data representing 98.7% response rate. The research questions were answered using mean and standard deviation.

### Research Question 1

What are the impacts of business education teacher programme on the use of technologies as a twenty-first century teaching challenge in Nigeria?

Table 1. Mean rating and standard deviation of teacher use of technologies as a twenty-first century teaching challenge (N=306)

S/N	Teacher use of Technology	X	SD	Decision
1	Inability of teacher to manipulate modern teaching gadgets has a negative effect on teaching	3.67	0.45	VGE
2	I can design a software for the subject I teach	3.35	0.33	GE
3	There are sufficient electronic teaching device in my institution	2.91	0.38	GE
4	There is an ICT network base for research in my institution	1.20	0.46	NA
5	I can use computer for presentation	2.43	0.45	GE

Table 1 revealed that the mean response ranges from 1.20 - 3.67. The highest mean rating in this cluster is item No. 1 (3.67): Inability of teachers to manipulate modern teaching gadgets. The lowest mean rating is item No. 4 (1.20): There is an ICT network base in my institution. Table I reveals a negative effect of business education teacher programme on the twenty-first century teaching challenges.

### Research Question 2

What are the impacts of business education teacher programme on teacher communication skill as a twenty-first century teaching challenge in Nigeria? Table 2 revealed that the mean response ranges from 1.98-3.78. The highest mean rating in this cluster is item No. 5 (3.78): Teachers are trained on how to develop and use variety of instructional aids for classroom communication.

Table 2. Mean rating and standard deviation of teacher communication skill as a twenty-first century teaching challenge (N=306)

S/N	Teacher communication skill	X	SD	Decision
1	Teacher education programme improve teacher's use of interactive white board for classroom communication	3.57	0.71	VGE
2	Class size is a key factor of effective classroom communication	3.56	0.78	VGE
3	There is need for electronic communication devices in the classroom	3.54	0.48	VGE
4	Teachers are trained on how to overcome students listening disabilities	1.98	0.41	SE
5	Teachers are trained on how to develop variety of instructional aids for classroom communication	3.78	1.04	VGE

The lowest mean rating is item No. 4 (1.98): Teachers are trained on how to overcome students listening disabilities. Table 2 further reveals that teachers are not effectively trained to sustain students' interest, attitude and listening ability which has a negative impact on twenty-first century teaching.

### Research Question 3

What are the impacts of business education teacher programme on students' individualized learning as a twenty-first century teaching challenge in Nigeria? Table 3 revealed that the mean response ranges from 3.20-3.50. The highest mean rating in this cluster is item No.1 (3.50) which states that software facilities enhances individualized learning; the lowest mean rating is item No. 4 (3.20): which states that the use of time table enhances individualized learning. Table 3 further

reveals that software facilities and use of time table are among the factors that affect twenty-first century teaching.

Table 3. Mean rating and standard deviation of teacher use of technologies as a 21<sup>st</sup> century teaching challenge (N=306)

S/N	Individualized Learning	X	SD	Decision
1	Software facilities enhances individualize learning	3.50	0.87	VGE
2	I am familiar with online education	3.33	0.38	GE
3	I use internet for my research work	3.48	0.51	VGE
4	The use of time table enhances individualized learning	3.20	0.48	GE
5	Individualized learning is capital expensive	3.49	0.59	VGE

### Discussion

The finding on Table 1 reveals the need analysis which is the missing gap (information and communication technology). Change in instruction and use of technology can promote higher level of learning among students with different types of intelligence (Olakulehin 2007) ICT has the capacity to support a wide range of learning activities; there is a shift from content memorization to learning to search and learning to learn. ICT applications facilitate delivery of instruction and consequently effective learning process. Therefore technology in teacher education is about information-communication-tools. This implies that teachers must be technologically competent and information literate in order to meet the twenty-first century teaching challenges. A close review of table 1 showed that teacher education programme lacks adequate technological facilities for training and it is believed that the teacher training programme is to determine whether training is needed, and if so, to specify what that training should provide. Furthermore, table 1 looks at the previous teacher training model which may be inadequate to satisfy the expectations and challenges to teacher preparation which has emerged from new educational initiatives. Okoro (2000) viewed teacher education programme to lack the necessary coordination with both the existing curriculum and the realities of the classroom which creates new challenge for teacher education and continuing professional developments. Therefore, there is need for flexible and interactive teacher programme; the government should create a Cyber-Teacher Training Center (CTTC). The CCTC should project a developed software platform for managing online teacher training. Nwosu (2009) online education is defined as an innovative form of distance education that delivers instruction to a remote audience, using computer networks as the main medium... The author made the following suggestions: government should develop an action plan for a large-scale introduction of computer from primary education to higher education; government should invest more on education, government should equip public schools with computers.

The finding on table 2 reveals that the integration of need analysis and electronic communication devices in classroom will enhance effective presentation by the teacher. The finding (Table 2) is in line with Bottilno (2004) who stated that the interaction between teacher-student-teaching aids enhances effective teacher communication skill, the author noted that every trained teacher must develop the skill of sustaining learners interest by adapting different strategies to achieve learning objectives. To meet the challenge of globalization, teachers are required to acquire the necessary skills, ability and knowledge to impact learning that will meet individual capabilities (232). This implies that the policies of teacher education programmes should be reviewed to accommodate modern electronic teaching device and facilities to enhance effecting training and acquisition of skills that will accommodate the twenty-first century teaching challenges. According to Ofojebe (2006) educational technology is basically the process of communication between the teacher, the instructional tools and the student while the subsequent feedback should signify understanding. This means that the teacher in tomorrow's class must acquire reading, writing, and communication skills to explore and discover new technological capabilities that will enhance teaching challenges and expand learning experiences. The author listed some educational communication tools to include computer, Twitter, internet, television and video tapes. But the issues are: does teacher education programme make provision for the vast changing technology and communication skills required for the twenty-first century teaching? Is

the programme adequate to effectively equip and train student-teachers on the use of new communication gadgets/software and content programming? (global communication, global technology). Grof and Mouza (2008) in their study recommended the integration of multimedia into instruction can reduce curriculum barriers and improve learning opportunities. Therefore, teacher education programme should be structured to meet the twenty-first teaching challenges in terms of new technologies (21).

Table 3 reveals that the use of technology such as computer with a network-base will enhance individualized learning. Integrating ICT into the teaching and learning process and the required tools and environment for learning are present will enhance individualized learning automatically. Individualized learning is an issue in the twenty-first century teaching, therefore, attention should be drawn to the provision of technical tools that satisfy the needs of the different group of teachers, also the understanding of their perception of professional development and identities should be noted. The findings on table 3 is in line with Eze and Mutelo (2001) who noted that individualized learning is a twenty-first century teaching challenge which teachers need to equip themselves with the required skills. Research and case studies have shown that online training via internet provides an opportunity to develop new learning experience for learners by managing self-directed learning, and sharing information and ideas in a cooperative and collaborative manner. The primary goal of student-centered classrooms is to help students become independent (Moon 2010) noted that if the allocated funds are channelled properly to the educational system and government at all levels invest adequate funds by equipping schools with adequate facilities and required tools, and the teacher programme is flexible to accommodate new technologies the issue of individualized learning which is a challenge to the twenty-first century teaching will be handled with less stress. Nwosu (2009) technology is the key to locking students' interest; the challenge is how to apply it, from the teacher's perspective, this process could be an intimidating experience because something as foreign as the computer and internet must be learned and then taught to the students in a classroom setting. The issue of facilities, environment, policies, funding, and preparedness for a change hinders student-centred learning in Nigeria. In view of this business education teacher programme should be reviewed in a new perspective by introducing significant changes in ways that teachers are trained by innovation, new technology and modern strategies.

### **Conclusions and implications for teacher education**

The missing ingredient in the existing teacher education programme which results in ineffective and inefficient training should be revitalized. The traditional method of training and developing teachers has come under severe attacks as inadequate, inappropriate and out of tune with current research on teacher development and identity. Today ICT has been considered a facilitator of the learning process. To create new types of learning environment and to open a wealth of new educational resources, the capabilities of ICT can be utilized in facilitating teacher training and enhancing basic skills about new approaches. Consequently, the integration of ICT into business education teacher programme must be arranged such that teachers are actively involved in the learning process (continuing the traditional method with the use of new technologies) the essence is to shift teachers' approach to knowledge transmission, and to knowledge building. Therefore the integration of ICT and use of computer for instruction will prepare the teacher for the twenty-first century teaching challenges.

Learning has emerged as a major challenge in today's changing world, so also has Information and communication technology has taken over every face of activity including the school, therefore, if modern instructional technology, communication gadgets and facilities are used for the training of business education teachers this will result in producing skill and qualified business education teacher who can effectively adapt, apply and integrate ICT in teaching learning process. This implies that the curriculum of business education teacher programme should be restructured to meet the twenty-first century teaching challenges in terms of new technologies.

Based on the findings of the study, the following recommendations were made:

- business teacher education programme should be reviewed in a new perspective of innovation, technology, method of training and facilities required for training;
- government at all levels should fund teacher education programme in terms of: provision of modern gadgets, computer, motivation, good learning environment and instructional facilities;
- ICT should be integrated into teacher education programme for uniformity and globalization. Teachers should be retrained on the use of new communication device, use of computer and online learning to enhance professionalism.

## References

- Ademola, A. 2000. *Curriculum development*. Ilorin: University Press.
- Alexander, P., and P. Winne. 2006. *Handbook of educational psychology*. Mahwah, NJ: Erlbaum.
- Ashby, P., A. Hobson, L. Tracey, A. Malderez, P. Tomlinson, T. Roper, G. Chambers, G., and J. Heal. 2008. *Beginner teachers' experience of initial teachers' preparation*. London: DCSF.
- Bottilno, R. 2004. “The evolution of ICT-based learning environment: which perspective for the school of the future?” *British Journal of Education Technology* 35 (5): 212-231.
- Cohen, L., L. Manion, and K. Mornison. 2003. *Research methods in education*. London: Routledge Flamer.
- Conrad, L., and TrainingLinks 2007. *Instructional design for web-based training*. Amherst, Massachusetts: HRD.
- Darling-Hammond, L. and J. Bransford. 2005. *Preparing teachers for a changing world*. San Francisco: Jossey-Bass.
- Eze, B., and H. Mutelo. 2001. *Introduction to computer system*. Enugu: Idika.
- Federal Republic of Nigeria 2004. *National policy of education*. Lagos: FGN.
- Groff, J. and C. Mouza. 2008. “A framework for addressing challenges to classroom technology use.” *Association for the advancement of computing in education (AACE) Journal* 16 (1): 21-46.
- Jegede, O., and M. Taplin. 2000. “Trainee teacher’s perception of their knowledge about expert teaching.” *Educational Research* 42 (3): 87-104.
- Jones, L. 2007. *The student-centered classroom*. New York: Cambridge University.
- Krejice, R., and D. Morgan. 1970. “Determining sample size of research activities.” *Educational Psychological Measurement*. 30: 607-610.
- Mark, S. 2010. *What technology needed to become a computer software*. US: CTI.
- Moon, B. 2010. “Time for a radical change in teacher education.” *Connections* 15 (1): 128-139.
- Nwosu, S. 2009. *Fundamentals of computer education and educational technology*. Enugu: Cedartop.
- Ofojebe, A. 2006. *Fundamentals of educational technology*. Ibadan: Y-Books.
- Olakulehin, F. 2007. “Information and communication technology in teacher education in Nigeria: past, present and future.” In *Proceedings of teacher's summit*. Kaduna National Teacher’s Institute, November 17-20.
- Okoro, D. 2000. *Measurement and evaluation in education*. Onitsha: Pacific.
- Rogers, C. 1969. *Freedom to learn*. Columbus, OH: Merrill.
- Sarah, E., and C. Stacey. 2000. *Computer, communication and information*. NY: McGraw-Hill.
- UNESCO. 2002. *Teacher education guidelines: using open and distance learning-technology, curriculum, cost, evaluation*. Paris: UNESCO.

[Back to contents](#)





## **Academic essay as dynamic scientific writing: a developmental journey for students studying to become teachers in finding their professional identities**

*Lars Wallsten & Åsa Morberg*

*University of Gävle, Sweden*

laswan@hig.se & amg@hig.se

### **Abstract**

The aim of this study is to develop a theoretical approach, inspired by a productive interface between artistic and didactic research, and a productive methodology for academic personal essays. The article is about a research project within preschool teacher education and vocational teacher education. The students' ability to write academic research papers has been shown to be problematic in a way that they seem to have lost the joy of writing. This situation is known nationally and internationally, and has been documented through research. The research question is: How can the use of academic essays support students' identity and ability in and enjoyment of academic writing? The preschool teachers explored their own experience in leadership and wrote essays about their leadership. Their process and methods in writing the essay strengthened their identity.

**Keywords:** dynamic writing; academic essay; artistic research; reflection protocols.

### **Context of the research**

The introduction and the aim of the research has been to develop a theoretical approach and a productive methodology for usage of academic personal essay writing in teacher education. The research question is: How to develop an alternative to ordinary scientific papers that support student's creativity and identity (Matre and Hoel 2007)? The teacher identity as it is described in the state curriculum is important to stress in the project (SOU 1999, 63) but also as it is described by researchers (Sandin and Säljö 2009; Alexandersson 2005).

### **Research question**

The research question is: How can the use of academic essays support students' identity and ability in and enjoyment of academic writing?

### **Theoretical framework**

The students' ability to write academic research papers has been found problematic and it appears that they have lost the joy in writing (Ask 2007). This situation is known nationally and internationally, and has been documented through research (Blückert 2010; Blåsjö 2004, 2010; Hagström 2005; Hållsten 2008; Lindgren 2005; Lendahls and Rosendahl 1998). It is not only for teacher education, it is also a problem for other programmes and there are reports from the National Boards of Universities which show that (Högskoleverket 2005, 2006, 2009). Ordinary scientific papers are frequently used in teacher education. The students lose their motivation which has an effect on their ability to write. They do not want to write after the scientific courses, where they practice scientific writing. This is a serious problem for the teaching professions (SOU 1999, 63).

The academic personal essay is a form of scientific writing that is different from ordinary scientific thesis, scientific articles or scientific papers, which often have a formal and stiff structure. Essays have a larger freedom, and the writer has to take a greater responsibility for his or her essay. The usage of essays is common in some of the different fields of research, especially within artistic research (Hansson 2011).

The aim is to develop a theoretical approach, inspired by a productive interface between artistic and didactic research and a productive methodology for academic personal essays but also

to study and to develop and support the academic writing process. See for instance Lindgren (2005). Such artistic practice based research uses essays to articulate different processes connected to the relation of theory, practice and experience. Artistic research looks at essay writing as a process, similar to an ordinary methodological process. The students have to stay within and trust the process while taking one step after another. To write an essay is like an artistic research process. Even the mistakes are useful in the process, which is different from traditional research. The academic personal essay encourages the students to explore their professional practice and to develop the essay based on their own practical experiences (Svenaesus 2009). The essay methodology is a common genre in the artistic research and has a broad testing approach at the same time as it is congenial with the artistic and reflective work. Therefore many artists choose the essay method.

The data consists of the written academic essays and student’s reflections protocol, which were made during the process in reflection (Zeichner and Liston 1987). Their own practical experiences are important to make an argumentation to other scientific perspectives. The critical reflective attitude is important in essays and in all sorts of academic writing (Jarrick and Josephson 1996).

### **Research methodology**

To sum up, the theoretical framework is a productive interface between didactic theory and artistic theory. A book project is currently planned on theory and methods in essay writing.

The design consisted of two parts: examination of a leadership course by an academic essay and a reflection protocol. The education in the course consisted of information of the theoretical and the methodological framework. The starting point for the research project on academic essays was a practical situation in a course in teacher education, where academic essays was used as a practical examination form in a leadership course in preschool education (Schön 1983, 1987). The data collected was the personal academic essay and the reflection protocol (Jossey-Bass Schön 1988). Each student wrote one page with their reflections in a protocol and they wrote without detailed instructions about the writing process. They were supposed to write about things that were invisible for the teachers.

Essay writing gives the opportunities to support students’ academic writing, as well as strengthen their personal identity and professional development. Academic essay writing has been tested on 150 students totally within the framework of four research projects since 2012. The research project has been called: “Essay as Thesis - Thesis as Essay, I-IV”. In this article, part II, is presented and discussed. Part II consisted of 25 preschool teachers essay writing.

There were opportunities to develop the students scientific writing and testing the academic essay as an examination form at the part “Leadership” in the course “Leadership and Values”, 15 HP. The course “Leadership and Values” consisted of two separate parts, Values, and Leadership. The course was the last course of the pre-school teacher education program. The organization, the content and the examination form must be adapted to these conditions. The motivation to tackle a major writing assignment before the exam was somewhat problematic. The text of the syllabus for examination provided that the essay could be used, and the examination would consist of an academic writing assignment. Written halls exam had been another alternative to essay writing. The traditional examination form was not attractive for the preschool teacher students. They unanimously preferred essay writing. The choice of academic essay as examination was discussed with the course Director, as well as with the Examiner for the entire course. It is important that all relevant information was given so that all lecturers felt an involvement in the decision. The students also had the opportunity to agree on the decision to use essay writing as exam.

### ***Students’ participation***

In the research project students participated from the preschool teacher education program and students from the vocational teacher education program as well as students from the Arts and learning education. This group consisted of 25 students and the results of the course became 22

published essays and 22 reflections (as one page each). Data in the research project consists of reflection protocols (one page) as well as one academic essay (Korp 2003). Two students did not complete their essays in time, and one student has not yet written his essay. The production rate is considered very well performed.

The students were informed that the essay might be presented outside the university and that their essays were an important part of the research project. One additional aim of the project was to gather material for a book in essay writing. The students gave their written consent to their participation, i.e. they admitted participation and publication of works in whole or in part.

The student group felt that the aim of the project was good for former students. They also felt that it would have been very good if they got this alternative essay form earlier in teacher education and in several other contexts (Alexandersson 2005). When the students had received the basic information they were content to write an academic essay as an examination assignment.

### ***Essay writing***

Introduction to examination in the form of an academic essay was given when the course started. Here are some important facts from the presentation: The essay is a shorter written text. An academic essay is not a fiction, but it should be designed so that it clearly carries the author's characteristic style or retain its originality. The language is more personal than characterized by factual prose that is objective and more aloof in its rhythm. The essay can be seen as an attempt to explain in writing a test or an examination of a phenomenon or a concept. In the work of the academic essays, it is important to explore their practical experience with the theme of an essay (Svenaesus 2009). Leadership is needed to be discussed from the perspective of the student's experiences. The Essayist decides the perspective, based on their personal points of view, even though the topic can be trivial or irrelevant to life. Sources and other references are used just as they come. The characteristic of an essay is in brief as follows:

- the essay often has an introduction that presents the topic of the essay and the author's starting points in writing;
- characteristics of the essay is that it should be of “moderate length” IE. Moderately long is in our research 3-5 pages;
- the essay's paragraph divisions are clear and with smooth transitions between the different parts. If subheadings are used they should be used with care;
- the essay takes up literary or scientific reference to emphasize an independent reasoning;
- the essay has a stylish and qualitatively good language. The essays will be written with using sources;
- in an essay literary outlines such as metaphorical language and repetition can often occur;
- the essay quotations are accurate and smooth.

An academic essay is associative, reflective and educational. A rhythm is created in the essay being the anchor with various references, while at the same time, of course, will be critical to the references through the authors important and necessary own reflections. It will of course be easy to find an idea behind the text. The text must hang together and can advance in both winding and staggering ways. This is broadly the areas dealt with in the introduction for their essay writing.

### **Findings**

#### ***“Entangled in an unproductive pattern” and “Difficulties to get out of a pattern”***

The result of this project is positive and the students produced good quality essay writing. The relevance of the chosen topics that were taken from their own experience of practice and the way the students wrote were considered the keys to this success. The conclusion of this research is that this type of academic personal essay may be considered to be a positive alternative or a complement to writing scientific papers in teacher education.

At first the students gave various expressions of uneasiness to write (academic essays), before they even received our basic information and instructions. They also expressed clear uneasiness to write at all. It is unfortunate that such an important professional function as writing creates bad feelings among soon graduating preschool teacher. They will be obligated to be able to write in their profession as preschool teachers.

They received the information on essay writing and then they had an opportunity to ask questions and to discuss the issue. The students views can be summed up as: “you feel that you run in an unproductive pattern”. One of the students summarizes their experiences as follows:

“Even though Åsa and Lasse said that we shouldn’t think about what was right or wrong, it felt just like when we signed our years at high school, after a template where we learned what should be included and that we shouldn’t anything of our own opinions without the support of literature. I felt that it was difficult to get out of the pattern.”.

Similar reflections occurred in the group and one of the students talked about “3.5 years of indoctrination” and also “loss of feeling the lustful in writing”. It was a sad experience to listen to the students’ attitudes towards writing. One student expresses a problem in a slightly different way:

“The difficulties I experienced in writing have been to associate, to develop and make the digressions, when I’m used to stick to the topic and not expanding out too much. I understand the idea of freedom, which this form enables, but after three years of indoctrination in writing after high school’s template, I could not feel the lust in writing. I’m probably corrupted to always stick to the rules and templates, which meant that I felt a great fear of that suddenly, have no template or rule to stick to”.

One student develops the sense of getting an examination assignment that involves writing an academic essay slightly different:

“I would have liked to have this kind of writing assignment at the beginning of the training so that you could get a different view on different ways to write, you might have seen several opportunities in the thesis then also, perhaps it could have been turning in a different direction. I hope that the essay will occur as a more common form in the university, because it gives a lot and it's very free and very fun way to write, it's not the feeling that we had in the thesis and it would not create write cramps where everything just freezes and it becomes blank in the head.”

One student expressed her stress when the examination would take place in the form of an essay. Her reflections concerning freedom as a threat:

“My first spontaneous thought was that after almost 3.5 years of study, we may write a text where we can express what we both feel and think. Our own thoughts can appear and it will be a more free text. This meant that I felt stress for the job.”

To summarize, all the students expressed that they have been drilled in writing scientific thesis and “correct” reports. They think that the structure they have been taught which they mentioned as IMRAD (which stands for the following: introduction, method, results, analysis and discussion) provides some protection, although there is no room for their own opinions and thoughts when students writes in the way they are accustomed to.

### ***Personal academic essays and the tutorial process***

The students got an introduction to essay writing at the course start, and then they got an in-depth theory and methodology review. The students had clear motives why essay form was selected as their choice. In the teaching of essay writing, we put the emphasis on that it is important to consider a different and lustful style. The student group gave feedback on the introduction that “they still liked the idea” and they thought “it was good to try another form of academic writing”.

The University will offer alternative forms of scientific writing meant for all but they were concerned that time would be a little too short to consider the essay form. No essays were offered as a model but they were offered to read an essay of free choice. It was a chosen methodical approach. An essay as a model can perhaps prevent their creativity in the writing process.

Methodological instructions were few but made as clear as possible. It was given specific examples of certain operations in order to facilitate the writing process. Various approaches to view the concept in different ways and to find possible other concepts which are central parts of essay

writing were also introduced. An example is:

“The supervision processes were presented so that everyone got a picture of what support they were offered. The tutorial was offered, both in individual supervision and as group supervision. One student summed up their experience of the need to get instructions on essay writing, but also the fear and concerns that do not cope with this: “when I realized that we were going to write an essay I thought, what is this, how do I write, and what am I going to write?”.”

The students expressed their experience of the introduction as positive, but a certain amount of frustration appeared in their reflections. They were given a theme for the essay writing which was leadership. “I’ve always liked the topic of leadership,” said one student to quote, “but the essay form, in early education had been the very best. I have learnt a lot”.

There were students who thought that the introduction was problematic, because they did not understand what the text would end up like: “I felt it was scary because it was a new way of working and it felt completely alien”. Another student says, “it’s good to get to write more freely and more personal, yet formal. I see it as an advantage since it is this way that I should follow when I write an informational letter to parents.”.

The students were positive, curious but also a little concerned about the freedom they had got in the writing process. Students compared previous texts and pointed out that “the texts they wrote during the earlier part of the training lacked emotion and was relatively difficult and laborious to get through”. One student said that the briefing before the essay was too thin. The student claimed that the examples given on how to work with the concept were difficult to absorb:

“The confusion and the feeling of making error persisted after the briefing with Lars and all the dedication he talked about confused me. Especially the parallel he drew up with obstacles and Gessle's song, in a Cole Porter song, on to Cole Porter, to a different text on a fence. Then I felt it here, I will never manage.”.

In conclusion, they were pretty much all positive to the tutorial that we presented. We pointed out that it was possible to provide supervision in the course within the budgetary framework which the students understood. We stressed the fact that the tutorial along the way were of crucial importance to be able to evolve in the attempt of essay writing.

### ***To be led by the hand and to let the students go***

The students were positive about both the joint guidance and to the individual tutorial. The individual tutorial was given personally and in writing through the Blackboard. The individual and personal guidance to students were used only by a few. The personal guidance was close to the submission of the final version. Group tutorials were given whenever we could. Regarding the written comments the students were very happy and grateful for this guidance in the process. One student pointed out the quality of the comments:

“My comments on the essay were very good. It felt a bit contradictory that we would write a little more freely, but when it came down to it, as you said that we should “tighten up the text” and put in some “thesis” in it.”.

The same student showed a great gratitude to everything and that she had learned something new and interesting. The student also hoped that she would be able to write an essay. One student also says that she was grateful that she had the opportunity to test this method with writing an essay:

“I have never before written an essay, and I have had a hard time harnessing the essay possibilities. A completely different way of writing has influenced my education at the University of Gavle, which has changed my way to thinking about writing that constituted obstacles to myself while writing this essay. I've had hard to soar off into my writing. My essay is very narrative. I have really tried to enlist the help of the comments I received to my first version of the essay, but I know that my mind set always stops me. I wish that we had this opportunity to write an essay earlier in the education because I think it would have helped my writing during the degree project. To get exercise to write more freely and more personal, but still formal, I see as an advantage since it is this style I should apply when, for example, I'll write the information letter to parents.”.

It has been an evolving process for students who eventually perceived this as something

positive for their development. Another student points out the tutorial in this:

“Tutorial by Lasse was both rewarding and very useful. I got many insights, thoughts and ideas. Writing an essay is somehow more freely, it is allowed to float away, allowed to associate further, and draw parallels. However typing cramps sometimes appeared and panic once again and I was unsure if I followed the red thread because I did not managed to convey what I want, and had in my head. After many tears and much deleting I have finally got together three sides to submit.”.

The same student ends with: “Thanks to both of you for having opened up my enjoyment in writing again”.

In conclusion the students were satisfied with the guidance they received and they were positive to the model in use. Looking at the results of the essays it occurred in the results that there could have been necessary with a couple of occasion’s additional guidance. But there were no resources or time for more tutoring.

The frames were clear and distinct and the tutorial was planned in three steps, however contributed to give an acceptable quality of the essays. All the students who submitted an essay was approved. The products have been discussed together with the students. They also came with their own reflections and conclusions that we summarized with the reflections from two vantage points: experiences of writing the essay and how essay writing can develop the students’ academic writing skills.

The students had numerous comments on the essay writing education part, above all, on the thesis work, but also about writing assignments in other courses.

They virtually lifted all the enjoyment in writing essays. Some students said that it was the most fun they had done throughout their education.

They also believed that teacher education should provide all students an opportunity to examine this form of essay writing, already in the beginning, not to damage the creativity or to make them afraid of going outside the template.

One student writes in his reflections:

“I think I can see and understand the potential of writing in essay form even though it was a completely new form to meet and just at the end of the training. It was strange but nice to try to be winding in my mind and in my writing. Just essay form might have been a good way for me to work with during the whole training period since I experienced that I always had to struggle with my writing.”.

The same student also lifts the importance of a combination of the writing forms to appeal, develop and challenge the students. One student expresses gratitude for having been given the opportunity to test the essay method and had earlier taught himself some of this method. They eventually got individual reviews of the final essay and an assessment of the results of the examination task. It was a very positive atmosphere for final accounting.

## **Conclusions and implications for teacher education**

The outcome of the essay writing became much better than we had expected. The students tried the essay methodology. They felt that it was difficult to decide what to write and also how they should pursue. They all tried their very best according to the reflection protocol. The theoretical framework was different from what they were used to and the methodology worked well.

It would have been good if a few more tutoring occasions had been possible. We would have liked five versions of the academic essays, but we were only able to have three versions. The quality was largely spread, but most of the essays were quite good.

Each essay was discussed both as a product and process. The students also came with their own reflections and we summarized the reflections from two vantage points: experiences of writing the essay and how essay writing can be developed for students in higher education. They said that they have learnt a lot but it had been difficult to take responsibility on your own for the essay.

They got the tutorial for the final essay and an assessment of the results of the examination task. There was a positive atmosphere for their final accounting. One of the students said that the papers were so good that you’d think they were written by established authors. There were a couple

of essays that were sent in to be published in a magazine. These students had to work more with their essays before they were published. All students could pass the educational part: Leadership.

The essays were all printed in one report and distributed to students in advance classes. We did not print their individual reflection protocols, but the students had to give a summary orally. They got to read selected parts to the entire student group. There were students who had tested the essay form in the past and this had facilitated the completion of the essay task. They thought, however, that it was more difficult to write about leadership than about something that had a creative and exploratory theme.

Some found it difficult to comment on their own process because it was the first time they had written an essay. The education part Leadership in the course was highlighted as being very fruitful. The students saw a potential in the essay as a form, how it gives freedom in writing, despite demands and by the freedom it becomes interesting. They expressed the experience of essay form as more demanding in comparison to traditional academic writing that is thesis. However they carried a right or wrong-thinking which complicated their writing process.

We now summarize the essay writing and make a series of reflections for our further work. The most striking result is the increasing enjoyment in writing and the newfound inspiration to write that was expressed by the students. One student that has reading and writing difficulties could not hold back tears at the introduction of the essay assignment. The same student said after the course was completed that she had written a letter to the editor of a newspaper in her home town, and the article was already published on the Web in the local newspaper. She was very happy about this. She stated that the investigation of her own practice was fruitful to her writing process.

The tutorials for the essays seemed heavy, because there were three versions of the essay forms. Although it would have been desirable for us to work with five versions, in order to reach really top quality. All students received a personal letter in how to reach better quality. Our tutoring was limited in scope. Group tutoring was also taking place in parallel with the individual tutorial. In addition to the individual text was a summary text compiled for the entire group's essay writing. The tutorial took longer time because all the essays were different, but this can certainly be enhanced.

The result of the essay writing is good when it comes to both form and content. Students demonstrate a sound knowledge of leadership and prove to be briefed on both course books and their reference literature. They were noticeably proud of the result.

There was no traditional statement with an opponent and a respondent. Everyone had to read all the others essays. They had to tell us about the process of essay writing and they had to read one part of the essay loud. They also presented their writing process. The discussion was about the content of the essay as well as the form of the essay. The contribution of knowledge was highlighted. The students were very surprised by the results which they thought was very interesting and inspiring.

The interest for this at the university had been very low. According to the research and education strategy all lecturers must combine research with their own teaching, however, the heads of the university denied that there was an essay project at the Academy.

The project has been presented to the Ministry of Education in Sweden and also to the Chancellor of the Agency of the Universities. This type of academic personal essay is considered to be a positive alternative to scientific papers in teacher education, but also in other courses (SOU 1999, 63). It is also a possibility to look at academic personal essays as an alternative to traditional scientific thesis. Since the project has been presented to the Ministry of education and science and at the national boards of Universities both Secretary of State Peter Honeth and the University Chancellor Lars Haikkola were in favor of the academic essay. On the basis of these evaluations made the work has stalled, which is unfortunate. The national boards of universities determine the goals, while universities will determine the method. The essay as a form is supported by the supervisory authority for universities.



## Endnotes

1. Academic essay is used in the article. The researchers constructed the concept. It is a generic concept, not a subject oriented concept.

## References

- Alexandersson, M. 2005. *Praxisnära forskning och läraryrkets vetenskapliga bas*. Stockholm: Carlssons.
- Ask, S. 2007. *Vägar till ett akademiskt skriftspråk*. *Acta Wexionensia, Humaniora* 115/2007. Växjö: Växjö University Press.
- Blückert, A. 2010. *Juridiska - ett nytt språk? En studie av juridikstudenternas språkliga inskolning*. *Diss. Skrifter utgivna av Institutionen för nordiska språk* 79. Uppsala universitet.
- Blåsjö, M. 2004. *Studenters skrivande i två kunskapsbyggande miljöer*. *Stockholm Studies in Scandinavian Philology* 37. Stockholm: Almqvist & Wiksell.
- Blåsjö, M. 2010. *Skrivteori och skrivforskning. En forskningsöversikt. 2 uppl. MINS* 56. Stockholms universitet: Institutionen för nordiska språk.
- Hansson, G. 2011. *Var slutar texten?* Göteborg: Göteborgs Universitet. Litterär gestaltungs skriftserie, N: o 10
- Hagström, E. 2005. *Meningar om uppsatsskrivande i högskolan*. *Örebro studies in education* 12. Örebro: Universitetsbiblioteket.
- Hållsten, S. 2008. "Ingenjörer skriver. Verksamheter och texter i arbete och utbildning. *Acta universitatis Stockholmiensis*." *Stockholm Studies in Scandinavian Philology New Series* 45.
- Högskoleverkets rapportserie. 2005. *17R Utvärdering av den nya lärarutbildningen vid svenska universitet och högskolor. (Del 1: Reformuppföljning och kvalitetsbedömning)*. Stockholm: Högskoleverket.
- Högskoleverket 2006. *Utbildning på vetenskaplig grund - röster från fältet Högskoleverkets rapportserie 2006:46*. Stockholm: Högskoleverket
- Högskoleverket 2009. *Förkunskaper och krav i högre utbildning*. Stockholm: Högskoleverket Rapport nr 2009: 16 R
- Jarrick, A., and O. Josephso. 1996. *Från tanke till text: en språkhandbok för uppsatsskrivande studenter*. Lund: Studentlitteratur.
- Korp, H. 2003. *Kunskapsbedömning - hur, vad och varför*. Stockholm: Fritzes.
- Lendahls, B. 1998. *Examensarbetets innebörder. En studie av blivande lärares utsagor*. Göteborg: Göteborg: Acta Universitatis Gothoburgensis.
- Lindén, J. 2005. "Handledning-en konceptuell ram." In *Handledning - perspektiv och erfarenheter*, edited by M. Larsson and J. Lindén, 11-28. Lund: Studentlitteratur.
- Lindgren, M. 2005. *Den skrivande studenten. Idéer, erfarenheter och forskning från Textverkstaden vid Växjö universitet. (Rapporter från Växjö universitet, Humaniora 15/2005)*. Växjö: Växjö universitet.
- Lindström, L. 2006. "Pedagogisk bedömning". In *Pedagogisk bedömning. Om att dokumentera, bedöma och utveckla kunskap*, edited by L. Lindström and V. Lindberg, 11-27. Stockholm: HLS Förlag.
- Matre, S., and T. Hoel-Løkensgard. 2007. *Skrive for nåtid og framtid, 2. Skrivning og rettleiing i høgre utdanning*. Trondheim: Tapir.
- Richtert, A. E. 2002. "Teaching teachers to reflect: a consideration of programme structure." *Journal of Educational Studies* 22(6): 509-527.
- Sandin, B., and R. Säljö. 2009. *Utbildningsvetenskap - ett kunskapsområde under formering*. Stockholm: Carlssons förlag.

- Strand, H. 2006. "Vad händer mellan b-och c-uppsats? Studenters skrivutveckling i medie- och kommunikationsvetenskap." *Språk och stil* 16: 35-73.
- Schön, D. 1983. *The reflective practitioner: how professionals think in action*. London: Temple Smith.
- Schön D. 1987. *Educating the reflective practitioner. Towards a new design for teaching and learning in the professions*. San Fransisco: Jossey-Bass.
- Svenaesus, F. 2009. "Vad är praktisk kunskap? En inledning till ämnet och boken." In *Vad är praktisk kunskap?*, edited by J. Bornemark and F. Svenaesus, 12-14. Huddinge: Södertörns högskola.
- SOU. 1999. *Att lära och leda. En lärarutbildning för samverkan och utveckling*. Stockholm: Utbildningsdepartementet.
- Zeichner K., and D. Liston. 1987. "Teaching student teachers to reflect" *Harvard Educational Review* 57 (1):23-48.

[Back to contents](#)



## **What was that all about? Transforming identities of schoolteachers as academics: a critical study of transition and meaning making**

*Doreen Rorrison & Patricia Logan*

*Charles Sturt University, Australia*

dorrison@csu.edu.au & plogan@csu.edu.au

### **Abstract**

This international research project explores the perceptions of university appointees transitioning from professional practice to academia. The experience of teacher educators as they move from teaching in schools to the university is discussed. By probing deeply aspects of the transition that emerged as critical to the negotiation of an academic identity we uncover differences in professional and academic backgrounds, experiences, personalities, supporting and systemic structures, values and politics yet very similar perceptions of the need to interrupt the traditional processes of academic transitions. Through auto-ethnography and narrative we uncover ways that academics can reflect, poke holes in false identities thrust upon them, acknowledge the roles of their peers in their developing academic identity and work outward towards those spaces that make them human. But the narratives also illuminate despair and ontological insecurity as participants reflect on how they are positioned as “deficit” academics and the confusing status of a doctorate.

**Keywords:** academic transition; identity; narrative.

### **Context of the research**

The initial aim of this research project was to investigate the complexities of the development of an academic identity through comparing the transition experiences of the “traditional” pathway to the PhD, post-doctorate research and university teaching, with a more recent move to the employment of practitioners directly from the professions to the academy. However it became clear that although the early narratives we collected enabled us to identify a range of practical understandings to benefit the transitioning academic (see Adams, Logan, Rorrison, and Munro 2013), the identity struggles uncovered through the reflective narratives became a more interesting project. To research the extent of the transitioning issues we extended the project to four countries. As we probed more deeply the lived experiences of the participants, a wide range of journeys, personalities, systemic structures, values and politics were uncovered that had wide reaching implications for practice. It became obvious that the participants had a story they wanted to tell, one of moral and personal reflection and struggle that left them deeply concerned and unsettled in terms of their identity as academics.

### **Research aim**

This paper explores the perceptions of university appointees as they transition from professional practice to academia. While the neoliberal discourse has succeeded in marginalising alternative conceptions through its dependence on accountability, surveillance and political posturing, the narratives of academics in this project offer alternative visions that question these practices. Through auto-ethnography and narrative we uncover differences in professional and academic backgrounds, experiences, personalities, supporting and systemic structures, values and politics yet very similar perceptions of the need to interrupt the traditional processes of academic transitions. We engage with this debate, not to provide definitive answers, but to interrogate the possibilities of alternative practices and new ways of understanding the transition process. Issues around opportunities to contest the dominant political consensus and powerful forces in the university that dictate how we might think and act are discussed.

As their academic identity develops these new academics reflect, poke holes in false

identities thrust upon them by others, acknowledge the roles of their peers in their developing academic identity and work outward towards those spaces that make them human. But the narratives also illuminate despair, disappointment, alienation and frustration that culminates in dissatisfaction with their perception that they have moved from being successful and leaders to being positioned as “deficit” academics. This is most obvious in the conversations around the confusing status of a doctorate. Issues of a powerful university culture seemingly unable or unprepared to make the changes to successfully transition those from the professions emerge. Evidence of resistance and competition, crises in work/life balance and inability to translate the symbols and mores of academic culture are uncovered. Through taking a critical approach this project provides guidance through eight recommendations of ways to better understand how, through appropriate intervention or action, an alternative vision is possible.

### **Theoretical framework**

Substantial changes have occurred in the Higher Education sector over the last three decades. When we framed this research project there was limited literature interrogating the effect of the changes for academics. Increasing accountability and managerial agendas and their impact on the academy were discussed (Anderson, Johnson, and Saha 2002; King 2001; Marginson 2001), yet the identity and professional impact was seldom considered. More recent publications discussing university academic work environment (Boyd, Bakker, Pignata, Winefield, Gillespie, and Stough 2011; Hil 2012; Langford 2010; Shin and Jung 2013) have identified increasing demands, changing expectations, relatively low salaries, growing unrest and stress as well as differences between national traditions. There appears to be increasing dissatisfaction, alienation and low moral as a result of “changing times” (Alvesson, Ashcraft, and Thomas 2008; Ball 1999, 2000; Hil 2012; Schostak 2012; Yates 2011) as well as a plethora of papers, interviews and addresses that focus on the “new possibilities” that might be created (see for example Archer 2008; Bradley 2011). With the Kemp-Norton Report on the Demand Driven Funding System now dominating policy debate within the sector in Australia (Bebington 2014) further major changes are expected in line with recent changes in the US and UK.

It appears that the significant changes in academic life and work frequently relate to the move to accountability and efficiency principles. In Australia and the UK, where the managerial reforms are most advanced, academics report higher levels of stress and dissatisfaction, while those in South America and Japan and other parts of Europe appear to still enjoy less stress and higher status and autonomy (Changing Academic Profession (CAP) survey, 2007-8). The move to “measured research output” over the past two decades has resulted in unrealistic and ubiquitous research and publishing pressures. In countries where both research output and university teaching are expected, academics report highest stress levels (Cretchley 2009; Goldsworthy 2008; Shin and Jung 2013).

Ironically the last decade has also seen an increase in the employment of practitioners directly from the professions to teach in the disciplines that prepare scholars for the professions (a practice turn). These practitioners are employed for their professional and practice knowledge with little consideration for their teaching or research skills. While the “typical” new academic had previously completed an undergraduate degree, a research Masters and/or a PhD, these “atypical” practitioners have learned their skills and knowledge while in the field and in practice. Archer (2008) also adds that employment of faculty with biographies quite different from the traditional university post-graduates is likely to become more common throughout the academy.

Since the 1970s when the neoliberal revolution began to reverse the liberation movement and contest the welfare politics by restoring global dominance of economic and vested interest, the Anglo-American academy has been slowly restructured through the new social and political settlement. As a consequence academics are finding less and less opportunity to access spaces for moral, critical, liberatory and independent thinking and acting. Discussion of values like morality, equality, autonomy and justice in the academy are silenced by the rationality of quality, evidence based, performance appraisal, accountability, branding and privatisation with a move towards

research only universities (Goodson 2007; Lingard and Gale 2007; Massey 2012). Yet it appears that it is not only the language, politics and policies that are having insidious affects. As a result of the competition for places and funding, behaviours that are competitive, scheming and appropriating are increasingly reported (Archer 2008; Hil 2012). Sadly the new agenda has also succeeded in marginalising alternative conceptions through its domination of the discourse and hegemonic logic (Hursh and Henderson 2011; Apple 2014).

Both the popular press and recent research publications tell us that many extremely talented intellectuals have been lost to academia during these years of accountability pressures and political posturing that limits opportunities for critical and independent thinking (Hil 2011; Schell 2014). Alexandre Afonso, a lecturer in political economy at Kings College, is reported in the Australian Newspaper (2013) as claiming “the life of academics is remarkably similar to that of drug gangs, with income distribution and job security skewed to the few at the top and the rank and file willing to be exploited in the hope of better prospects”. He also “points to massive increases in the supply of PhDs since 2000 in all OECD nations” but laments the dramatic reduction in university positions and the growth of the unskilled element that the sessional employment contract mentality attracts (see also Leigh 2014).

Archer (2008) refers to the folding of power (Foucault 1980; Deleuze 1992) and comments like “I felt I had a no choice, so I couldn’t complain” are typical. The neoliberalist discourse works to close down the options and remove the dissent through not only the high levels of output expected but also the levels of surveillance experienced. Archer questions whether the pernicious reach of neoliberalism can only result in a closing down of the hearts, minds and souls of the academic. However, Gramsci (1971) reminds us that we are implicated in our own subjugation and that no hegemony is ever complete. More recently, Massey (2012) develops this argument in her paper “The Political Struggle Ahead” by challenging the dominant political consensus and reframing the questions about what we stand for, about society, humanity, ethics and in whose interest we act. Apple (2014) continues to address crucial controversies and contradictions confronting the rightist resurgence in education, as he has been doing now for nearly half a century. Such questions frame the research problem in this project.

Schostak (2012) positions the question very clearly when he asks what might the university become in the context of the entrepreneurial demands:

“...the increasing demand that university work is to add value for business and be shown to be “world leading” through competitive publishing in high-ranking journals and in securing research funding [leading] to an increase in data manipulation, fraud and other forms of misconduct to secure the coveted ratings.” (255).

Similarly, the well-known Australian researcher Lyn Yates (2012) questions the normative view asking:

“...whose answers to the question “what is education for?” should get priority - those of economists? politicians? parents? educators? students themselves? (And where does the work of education researchers and scholars fit in?) Whose interests are taken as the norm, and which qualities are made invisible or inferior in education policy and practice?” (260).

It is our view that Yates and Schostak reflect the prevailing concern that the world appears to be spinning faster, shaking, questioning or transforming the traditional institutions, processes and underpinnings of academic work. Questions are being raised about the purpose of the academy and the motivation of the current governments who wish to micromanage higher education.

At the beginning of the twenty-first century Ball (2000) also suggested “there are “new modes of description” and “new possibilities for action”; thus creating new social identities of what it means to be educated; what it means “to be a teacher” or a researcher” (4). In his quest to understand these new identities Ball refers to Deleuze (1992) when describing the changes and the “ontological insecurity” (5) that might result. He too claims that “commitment, judgment and authenticity within practice are sacrificed for impression and performance” (6) and like Yates and Schostak, questions the devotion to “performativity”, given it results in inauthentic relationships and practices and an alienation of the self. He takes up the notion that the appearance of responsiveness to the consumers, the “clients” and the market actually results in a “fabrication of

performance” (15) that replaces professional judgment and creates winners and losers. This is the environment that we began to recognise around 2007 that concerned us and led to this research project.

### *Critical ethnography*

The work of Richardson (1994, 2000), Ellis (1992, 1997) and more recently Sinner (2013) demonstrated how narrative and creative non-fiction can be both a literary connection and a method of inquiry to uncover the nuances within reflections on lived experience. The extant literature provides evidence that narrative, portraiture, stories and vignettes can be used “...to document how we live now so that we might change how we live now” (McLaughlin and Tierney, 1993, 4). Denzin and Lincoln (1994, 512) suggest we should “work outward from [our] own biographies to the worlds of experience that surround [us]” as we critically reflect on the social and physical structures that mould us. The use of critical narrative frameworks for the sharing of stories provides deeper understandings and can be a powerful medium for revealing tacit knowledge and contesting the hegemony (Richardson 2000; Ellis and Bochner 1996).

Popkewitz (1997) also supports the emancipatory potential of life-storying and auto-ethnography claiming:

“[T]he historical task of placing ourselves into history is that we may, collectively through our actions in the present, poke holes in the causality that organizes the constructions of our “selves”. And in the process, there is possibility of opening new systems for our collective and individual lives.” (156).

We believe that critical ethnography is effective for uncovering and understanding the experiences of transition and academy identity. Bosetti, Kawalilak and Patterson (2008) report a small study where they were trying to make sense of responses by faculty to the changes occurring in Higher Education. They too provide evidence through auto-ethnography of the conflict between “what is valued” and “what is expected” by women transitioning to the academy. Through the construct of “liminality” these women uncover both anxiety and caution as a result of their transitional status and a subsequent withdrawal from their work role. They discuss feeling “betwixt and between” (98) as they share their stories to help construct a better understanding of the way they feel and react. Schell (2014) also suggests that a sense of liminality is important and can lead in the end to a more successful transition into academia.

Previously Rorrison (2002) used storying to establish a “project of possibility” to help school teachers understand that they are a part of the diagnosis and part of the search for an alternative vision for education that can make a difference in the lives of their students. She revealed that by focusing on the consequences rather than the intention, on context rather than the personal, we can extend the ability of others to recognize and interpret the politics of their work so that they too can challenge hegemony.

Criticality, in terms of a commitment to democracy and challenge to oppressive practices and policies is also important to this project and both authors, previously practitioners, challenge the prevailing neoliberal context of the universities where we have worked. We both used narrative and perspective to “tell stories that we fear to hear” and further our emancipator vision during our PhD research (Rorrison 2007; Logan 2008). We concluded that our roles as academics should provide us with spaces for discretion, choice, reason and the courage to acting differently. Similarly in his essay “Schooling and Education after Neoliberalism” Schostak (2012) suggests: “Education is about attending to and taking into account alternative ways of perceiving, experiencing, imagining... of seeing, of making visible, of perceiving and reflecting upon what is perceived.” (251). By probing layers within the social geography of academia through reflective narrative we believe we can make visible a “new” story and a more authentic story to inform transition practices.

### *Identity*

There are a number of current research publications focusing on the identities of the academics who are negotiating an organisational structure that values what is seen to be done rather

than substantively what is done. They question what “identity” means in an organisation that has a well developed and funded corporate brand but provides few supports and little guidance to its new employees and where the experience of the transitioning academic differs dramatically from discipline to discipline, faculty to faculty and university to university. Alvesson, Ashcraft, and Thomas (2008) propose an “identity turn” to help negotiate these changing expectations. Through identity theorising and the development of frameworks for analysis, they suggest patterns and phenomena might be captured to help frame a new understanding of the transitioning academic. Although not committed to a particular “theory of identity” they suggest that to focus on identity will provide a range of theoretical considerations and cognitive orientations. Although their study focuses on organisational life and not specifically the academy, they lead us through a discussion of the personal and social identity that helps us understand the “lived needs of a particular historical moment” (13). As Kincheloe (2004) wrote “We need to find a diversity of possibilities of what we might become by recovering and interpreting what we once were.” (124).

To probe more deeply the literature on multiple identities, and more particularly the past, present and future “role”, “personal” and “social” identities of the academic, we turned to the “Handbook of Self and Identity” (Leary and Tangney 2003). In the preface of the volume the editors state

“One of the most notable things about human beings is their ability to self reflect...to form images and ideas of what they are like... To ponder important questions about themselves, to seek outcomes that are congenial to their sense of self, to exert deliberate control over themselves, and to engage in other acts of selfhood. ...researchers and theorists have made enormous strides in illuminating these quintessential human processes related to the self.” (xii).

In chapter seven Stets and Burke develop this idea of reflexivity and the ability to reflect back to evaluate past actions and plan future states, which they call a “consciousness of the self”. Through reflexivity the symbols and signs of others are merged into perspectives of the self, so identity becomes both personal and social. They claim “It is this self-image that guides moment-to-moment interaction, is changed in situated negotiation, and may act back on the more fundamental self-views.” (132).

Through linking self-image to self-esteem Stets and Burke provide evidence from identity theory that social, personal and role identities have a significant affect on self-image. Furthermore these studies stress the emergence of multiple identities linked to agency in the multitude of roles and self-views of the individual. They quote Thoits (2001) who states that through their agency “...individuals can make or create a role by making behavioral choices and decisions and engaging in negotiation and compromise as well as conflict. Research finds that making roles and accumulating role identities fosters greater psychological well-being.” (134).

Stets and Burke also suggest that there is a hierarchy of prominence of these roles depending on support from others, commitment and rewards. This verification of role identities and counter identities is important to the analysis of the narratives of academic lives and will prove especially valuable as we look at role and personal identity transitions.

Churchman (2006) discusses identity in the different ways academic work is understood by other academics through the degree of compromise they perceive in relation to their roles. Churchman suggests three types of narratives; the corporate pragmatic narrative; the social collegial narrative; and the righteous altruistic narrative (6). It appears that the modern university deliberately reduces this perceived complexity of academic work through privileging of corporate pragmatic images and simplification of social and altruistic roles, with a resultant disjuncture between the rhetoric and the reality voiced by practitioners employed from the professions. Clegg (2006) agrees that there is no one academic identity and that the space itself is

“...part of the lived complexity of a person’s project ...multiply constituted, since for any particular individual, the site of the academic may include relationships with other colleagues globally, be a particular fragment of a department, and may include a range of activities, some of which are experienced as being academic and others of which are not” (329).

The academics in Clegg’s study constantly complained that the goal-posts were moving and despite their achievements they never seemed to be able to meet the changing criteria for what was



valued by the institution. Nevertheless, they were prepared to practice with integrity and resist what they saw as the eroding of academic values through marketplace compromises. Indeed Clegg concludes that the strong academic ethos of the respondents bodes well for academe. That is not to say there were not grumbles and stresses but Clegg discusses these as a resistance or defiance and a way to deal with the difficulties (342).

Coté (2006) also discusses identity as “multifaceted” (8) and manifested at three levels; “the subjectivity of the individual, behavior patterns specific to the person, and the individual’s membership in societal groups” (8). Coté relates to the late postmodern view of identity in terms of an unstable interactional process that links with perceptions of agency. It is transitional, emergent and transformative and as a result can be both sustaining and debilitating. Coté warns of the dangers of “identity manipulation” and false promises that result from the credentialing discourse of the modern university (18). In a similar vein Reybold (2008) discusses the occupational-academic dialectic for practitioners negotiating their role and identity in the academy and sees professional meaningfulness as “located in vocational identity and discourse” (142). Reybold’s study identifies the need for a dual identity for those transitioning from Adult Education to the academy, discussing the need for a “balancing act”, sensitivity to a new language, and the frustration of negotiating a “truce for the sake of professional survival” (143).

Although space does not permit a further review of the literature it appears clear that current understandings support the need to research deep into the experiences, identity and responses of academics transitioning from the professions. It is clear that different university traditions provide different pathways and this research focuses most strongly on the Anglo-American tradition where the managerial and fiscal pressures are dramatically changing the culture and climate of the academy.

## Research methodology

In an attempt to confront the issues that worried us and provide our colleagues with the opportunity to be authentically represented our research problem asks how do those entering the academy from professional practice develop their identity as an academic? As Burawoy (2009) writes:

“... to explore those differences in our midst and the divergent interests they foreshadow is not to discredit others, but to simply recognize that we, like the people we study, cannot escape the inequalities in which we are embedded, and that it is only out of confronting these inequalities that common enterprises can possibly be forged.” (4).

Associated research questions focus on how commencing academics from professional practice talk about their identity development as academics, the process of this development in contrast to traditional pathways and what they identify as the enablers and barriers to academic identity development. To explicate the way participants came to understand and manage their transitions to academia, we decided that feminist based conversational interviews that develop an emotional engagement and trust with the participant would provide the comprehensive and contextual narratives we sought. These conversations were prompted through four open questions related to (1) the participant’s decision to enter the university, (2) what they thought the position would involve, (3) whether their expectations were supported in situ, and (4) what they felt the future would hold.

The 16 Australian participants for the pilot study were purposively sampled for maximum variation. Taking advantage of contacts in a wide range of universities, both general emails and personal recommendations led to self-selection through interest in the project. The pilot resulted in minor amendments to the question phrasing and clearer guidelines for interview technique. Sampling strategies for the wider study continued to be opportunistic relying on both recommendation and interest, though the need for maximum variation and balance were also influential. A total of 37 interviews were collected: 22 Australian, 10 British, three Canadian and two Swedish. Twenty-two Health Practitioner academics (Nurse, Pharmacist, Sonographer etc), six from Science Faculties (Physics, Geology, Physiology etc), two from the Arts (anthropology and

media) and eight from teaching (Early Childhood, Science, English etc) were interviewed. As a result of the open interviewing with short prompting questions we believe that participants relaxed, “dug deep” and frequently bored into levels of comprehension not previously uncovered. Indeed there were a number of comments after interviews thanking us for encouraging the deep reflection that led to levels of moral and political knowing they had not previously articulated. The interview narratives were transcribed and after close reading and deep engagement the impacting phrases, thought changing comments, exceptional insights and common ideas were noted. Through a well structured and indexed audit trail of these memos or “meaning units” and related propositions or speculations, patterns and connections emerged (at times as conceptual leaps). These “meaning concepts” were then rubbed against the research questions providing “clusters” and more speculations or deductions to explain the patterns that emerged. These “clusters” and concepts were then linked, as themes emerged, and analysed through the critical questioning cycle. Clearly it is important for the researcher to show how they move from the empirical data or narrative to the research themes and theories and to ensure internal validity we used participant checking of the transcripts and dual analysis, and to ensure reliability we focussed on researcher agreement through discussing and clearly defining the patterns that emerged.

In a further and experimental attempt to ensure analytical reliability we used the qualitative content analysis program developed by Queensland University, Leximancer<sup>®</sup> 3.5. Leximancer<sup>®</sup> is a validated software package that builds a ranked list of terms according to their frequency and co-occurrence. These terms are used to develop a thesaurus based on iterative learning of the definitions determined by the context and these are then weighted to form a concept list. The context for a definition is created by the software examining words either side of the word being examined (Smith and Humphries 2006). The program parameters were set to search across three sentence blocks. The relative co-occurrence frequencies are then used to develop the 2D concept map. A table of ranked concepts and connectivity for the entire data set was also provided. When the narratives from the “teacher” group (n=8) was run against the others (n=31) there was little difference in the theme connectivity percentages. The concept maps do vary but it is clear that apart from the smoother transition to university teaching by those both qualified and experienced as teachers, their trajectory is very similar and their self-esteem equally challenged.

Following the method of co-mapping described by Penn-Edwards (2010) we lined up the manual examples and Leximancer derived examples for each meaning concept. It is apparent that the alignment is not precise, however it is equally true that the manually derived themes do not lie outside those the software identified. For example, there is a difference with regards to the meaning concept for “competitiveness”. Leximancer<sup>®</sup> highlighted many passages that identified the competition for time allocation required to undertake all aspects of the “job” or “work” while the manual analysis also identified the emotive aspects of competitiveness between academics. This highlights the importance of the manual analysis and indicates the limitation of using a fully automated qualitative analysis. We believe the software analysis of the transcripts however does act to support and add depth to the manual analysis by diminishing the risk of anecdotal evidence gaining undue prominence through researcher subjectivity. Apple (2014) would say the ability to include emotive aspects in the analysis raises substantive questions around inequality and power as competing definitions of ethics and social justice have persisted within modern systems of education since their inception.

The final step in our analysis was to act upon the themes that emerged through the critical emancipatory spiral to tease out new understandings in relation to an “identity turn” (Alvesson et al. 2008). Asking the critical questions stresses the moral and political nature of the narrative progressing the theorising of findings where the narrative is complex and multi-layered. Applying the critical questions (Smyth 1989, 486) involves four steps with probing critical questions that direct each step; describing what is going on, gathering information to work out how it came to be the way it is, confronting the evidence and asking what this means, and finally recommending or reconstructing things differently in light of the previous questions. In Smyth’s iteration it is cyclic while the spiral nature (Rorrison 2007) was developed to stress that the process does not go back to the beginning as in a cycle but builds on the new and reconstructed understanding as in an action

research spiral.

Asking the critical questions of the data provides considerable focussed discussion that would be rather unwieldy and unmanageable in a paper such as this. The process has been completed in full and is available by contacting the authors. Eight findings or recommendations emerged from the four steps of the critical questioning spiral and are provided below. It is important to note that these findings or recommendations follow a clearly defined critical approach after the Leximancer and manual analysis of the empirical data. The emergent themes from the initial analysis are linked back to the research questions to inform, confront and finally reconstruct our thinking. Furthermore the recommendations should be refined further after papers such as this and discussions within the academic community.

## Findings

One hundred and sixty six meaning units emerged from the close reading and deep analysis of the narratives describing the lived experiences of 37 participants and these were clustered as nine meaning concepts. These nine meaning concepts connected closely with the research questions, uncovering strong clusters or emergent themes. Six meaning units did not connect due to their random nature or mis-fit with what others were saying. Through asking the critical questions of the nine meaning concepts as they related to the research questions we offer our research findings as a series of recommendations. Through understanding that the university structures and processes are not immutable but are constructed in human interest with the resultant inequalities and injustices uncovered by our participants, we want to show that a new synthesis is possible, no, necessary (Rorrison 2002) because without this possibility there is little opportunity for those from the professions to access spaces to act with integrity and resist the practices they see as eroding academic values through marketplace compromises.

The first four recommendations (listed below) emerged from the first research question that focusses on how commencing academics from professional practice talk about their identity development as academics. The second research question that interrogates the process of this development in contrast to traditional pathways resulted in recommendations 5 and 6. The final research question aimed at identifying the enablers and barriers to academic identity development provides recommendations 7 and 8. Initially there were 10 recommendations but on further analysis some were found to be related and were grouped. Together we believe they bring us closer to answering our research problem that asked

How do those entering the academy from professional practice develop their identity as an academic?

Recommendation 1 (efficacy) - Genuine support should be offered to ensure that new academics can negotiate their roles, practices and future. Through equitable and transparent processes they should learn what is reasonable and fair in terms of their workload and role. Due to the diversity of previous experiences of new appointments this will need to be personalised and timely with a focus on wellbeing rather than performativity and output.

Recommendation 2 (empowerment) - During the transition of the academic, identity and agency issues should be prioritised and participatory and empowering practices used to support negotiation, compromise and open discussion.

Recommendation 3 (collegiality) - Those who have had a similar recent experience of transition are best placed to support new appointees from the professions. They should be supported with time to do this and they will also benefit through this reflective and communicative process.

Recommendation 4 (university culture) - University culture and traditions need to be translated for those from the professions as an important aspect of induction. The link between personal and social identity, self esteem and institutional and academic cultural knowledge should be acknowledged. The presence of competitive, patriarchal and nepotistic practices identified by the narratives needs to be addressed.

Recommendation 5 (Doctorate) - Steps need to be taken to uncover university core understandings and attitudes related to both the award of PhD and a Professional Doctorate and the differences between them. The relative value of the two doctorates needs to be clearly documented to avoid continued confusion about any hierarchical positioning.

Recommendation 6 (process) - Guidance and time for deep reflection (consciousness of self) and theorising are critical to academic identity development and transformation.

Recommendation 7 (support) - Processes akin to a post-doctorate need to be developed to provide continued support to academics after the completion of a Doctorate. While stability in their professional lives and ongoing commitment to and verification of their current role in the university are necessary, their needs as early career (post-doc) researchers should be supported in innovative ways<sup>1</sup>.

Recommendation 8 (purpose) - Respected academics who epitomise the commitment to public good and the humanistic ideal through their teaching should be valued for this as well as their research. Universities should commit to guiding new academics to find the balance in their role, personal and social identities in a way that satisfies alternative beliefs of academia as a moral, critical and liberatory service to society.

### *Discussion*

It is clear from our findings that the narratives are at the same time distinctly different and markedly similar. There is a sense of instability (Cote 2006) and liminality (Bosetti et al. 2008; Schell 2014) voiced by all our participants. Cote’s three levels of identity, namely subjectivity, specific behaviour patterns and collegiate support are noticeable in the first three recommendations and here also we recognise the need for professional respect of the “lived needs” (Ashcraft et al. 2008, 13) and role identity verification (Stets et al. 2003) of the transitioning academic. We can also recognise what Churchman (2006) names the “corporate pragmatic narrative; the social collegial narrative; and the righteous altruistic narrative” (covered by recommendations 4 and 8), but our findings expand on these to acknowledge the effect of traditional processes and the contradictions and inconsistencies of university cultures (also recommendation 4). Apple’s (2014) view of the conservative and rightist ideology of universities is also apparent through the reactivity of the narratives, highlighted through the equity and empowerment findings of recommendations 1 and 2 and the critical and humanistic aspect of recommendation 8.

Like Ball (1999, 2000), Yates (2004) and Schostak (2012) we believe our findings question the devotion to “performativity” and its potential negative affect on relationships, practice and sense of self, and focus instead on the moral, critical and liberatory potential of the academic role (recommendations 1, 6 and 8). Our findings also highlight the importance of reflection, self-knowledge and a consciousness of self (recommendations 3, 6 and 8) (see also Stets and Burke 2003, 131; Leary and Tangney 2003) as ways of avoiding the “identity manipulation” and false promises to which Coté (18) alluded.

Recommendations 5 and 7, however, are quite specific to this study and are linked to the second and third research questions where the focus is on process and barriers/enablers. What are the differences between the transition of those from the professions and those who follow the traditional academic pathway? So often we heard that our participants had perceived extreme pressure to complete their doctorate and then when they did, it was somewhat of an anti-climax and seemed not to matter after all. For those who chose a Professional Doctorate the explanation appeared to be that they should have chosen the Doctor of Philosophy, but we can report conclusively that the let down was just as extreme for those who completed the PhD. Indeed, this experience appears to be symptomatic of the transition experience of those from the professions. Their sense of liminality, of being betwixt and between, is palatable. Whether a change of post-doctoral process (recommendation 7) will alleviate this frustration is difficult to assess but its emergence as a major outcome of the critical process suggests its importance to the participants.

## Conclusions and implications for teacher education

In our own institution the recommendations from this project are being shared with academics from the professions as a new initiative to support their transition. We believe that through dissipating the findings from research projects such as this and stressing the need for transparency in the employment process, both new employees from the professions and their colleagues in the academy can transform their practice. As stated earlier we do not attempt to provide definitive answers, but our findings do direct a focus on the need for a more reflective, moral and critical understanding of developing academic identity. We found that new academics need to be given space to negotiate and compromise but such decisions can only be made when they are clear about the choices they can make. This clarity can only come when they are supported in their reflexivity and a merging of their sense of “other” and “self” is possible. Our findings suggest this can be as a result of feelings of liminality (Bosetti et al. 2008), resistance and defiance (Clegg 2006) or acceptance of a dual identity (Reybold 2008). It is the recognition of the struggle that is important.

Finally we return to the research problem. Lack of information, poor clarity of process, limited support and guidance, identity challenges and role confusion were all reported by transitioning academics from the professions. Through analysing the narratives of 37 academics from four countries and a range of professional backgrounds and relating their identity struggles to current literature and theories, we have evidence to suggest that despite their vast differences in context and place their experiences of disjuncture between the rhetoric and the reality have been markedly similar. This has allowed us to make a range of recommendations that emerge from our critical questioning of the findings and connect well to the extant literature. The recommendations are still in an early iteration, they need to be tested and refined through the action research steps of the critical spiral, yet we believe they offer a sense of possibility to those who take up the challenge on both an ideological and a practice level. It is clear that the experience of transitioning academics be they teacher educators, paramedics, actors or scientists, will benefit from consideration of the recommendations from this study.

## Endnotes

1. Fixed-term early career fellowships to provide aspiring academics with paid time to develop an internationally competitive research profile have recently been suggested by the NTEU <http://actualcasuals.wordpress.com/2014/06/24/is-academia-a-meritocracy/> accessed Aug 12

## Acknowledgements

Funding from Charles Sturt University Faculty of Health Sciences small grant supported this work. We acknowledge the work of Edwina Adams and Graham Munro during the pilot stage of this research. We appreciate the time and thoughts of academics around the world who participated in this research.

## References

- Anderson, J., and L. Saha 2002. *Changes in academic work: implications for universities of the changing age distribution and work roles of academic staff*. Canberra, ACT: Commonwealth of Australia.
- Alvesson, M., K. Ashcraft, and R. Thomas. 2008. “Identity matters: reflections on the construction of identity scholarship”. *Organisations Studies* 1(1): 5-28. doi: 10.1177/1350508407084426.
- Apple, M. 1996. “Power, meaning and identity: critical sociology of education in the United States.” *British Journal of Sociology of Education*, 17(2): 125-144.
- Apple, M., and A. Wayne eds. 2014. *Critical Education*. New York: Routledge.
- Archer, L. 2008. “The new neoliberal subjects? Young/er academics’ constructions of professional identity.” *Journal of Education Policy* 23 (3): 265-285.
- Ball, S. 2000. *Performativities and fabrications in the education economy: towards the*

*performative society*. Paper presented at the Frank Tate Memorial Lecture AARE Conference, Melbourne.

Bebbington, W. 2014. “Australia must ignore vested interests and seize chance for change.” *The Higher Education*, 17 April.

Bosetti, L., C. Kawalilak, and P. Patterson. 2008. “Betwixt and between: academic women in transition.” *Canadian Journal of Higher Education* 38 (2): 95-115.

Boyd, C., A. Bakker, S. Pignata, A. Winefield, N. Gillespie, and C. Stough. 2011. “A longitudinal test of the job demands-resources model among Australian university academics.” *Applied Psychology* 60 (1): 112-140.

Bradley, D. 2011. Keynote address University of Western Sydney conference A Scholarly Life.

Burawoy, M. 2009. Facing an unequal world: challenges for a global sociology. <http://burawoy.berkeley.edu/Global%20Sociology/Facing%20an%20Unequal%20World.pdf>

Clegg, S. 2006. “Academic identities under threat?” *British Educational Research Journal* 24 (3): 329-345.

Charles Sturt University. 2005. Enterprise Agreement 2005-2008 and Academic Staff Salary Rates. <http://www.csu.edu.au/division/hr/working-life/employmentconditions/Salary%20Information/salary-rates-academic-staff.htm>

Côté, J. 2006. “Identity studies: how close are we to developing a social science of identity? An appraisal of the field.” *Identity: An International Journal of Theory and Research* 6 (1): 3-25.

Cretchley, P. 2009. “Are Australian universities promoting learning and teaching activity effectively? An assessment of the effects on science and engineering academics.” *International Journal of Mathematical Education* 40 (7): 865-875.

Churchman, D. 2006. “Institutional commitments, individual compromises: identity-related responses to compromise in an Australian university.” *Journal of Higher Education Policy and Management* 28 (1): 3-15.

Denzin, N., and Y. Lincoln. eds. 1994. *Handbook of qualitative research*. Thousand Oaks: Sage Inc.

Ellis, C. 1997. “Evocative autoethnography writing emotionally about our lives.” In *Representation and the text: reframing the narrative voice* edited by W. Tierney and Y. Lincoln. NY: State University of NY Press.

Ellis, C., and A. Bochner. 1992. “Telling and performing personal stories: the constraints of choice in abortion.” In *Investigating subjectivity: research on lived experience* edited by C. Ellis and M. Flaherty. Newbury Park: Sage Publications.

Goldsworthy, J. 2008. “Research Grants Mania.” *Australian Universities’ Review* 50 (2): 17-24.

Goodson, I. 2007. “All the lonely people: the struggle for private meaning and public purpose in education.” *Critical Studies in Education* 48 (1): 131-148.

Hil, R. 2012. *Whackademia. An insider’s account of the troubled university*. NewSouth Publishing: Sydney

Hursh, D., and J. Henderson. 2011. “Contesting global neoliberalism and creating alternative futures.” *Discourse: Studies in the cultural politics of education* 32 (2): 171-185.

Kincheloe, J. 2004. “The knowledges of teacher education: developing a critical complex epistemology.” *Teacher Education Quarterly* Winter: 49-66.

Langford, P. 2010. “Benchmarking work practices and outcomes in Australian universities using an employee survey.” *Journal of Higher Education Policy and Management* 32 (1): 41-53.

Leigh, J. 2014. “I still feel isolated and disposable”: perceptions of professional development for part-time teachers in HE.” *Journal of Perspectives in Applied Academic Practice* 2 (2): 10-16.

Lingard, B., and T. Gale. 2007. “The emergent structure of feeling: what does it mean for critical educational studies and research?” *Critical Studies in Education* 48 (1): 1-23.

- McLaughlin, D., and W. Tierney. 1993. *Naming silenced lives: personal narratives and processes of educational change*. New York: Routledge.
- Logan, P. 2008. "Science in undergraduate nursing programmes: generating symbiotic praxis." Unpublished PhD diss., Charles Sturt University Australia.
- Marginson, S. 2001. "Trends in the funding of Australian higher education." *Australian Economic Review* 34 (2): 205-215. doi:10.1111/1467-8462.00190.
- Massey, D. 2012. "The political struggle ahead." In *The neoliberal crisis* edited by J. Rutherford and S. Davison. <http://www.lwbooks.co.uk/ebooks/NeoliberalCrisis.html>.
- Penn-Edwards, S. 2010. "Computer aided phenomenography: the role of Leximancer computer software in phenomenographic investigation." *The Qualitative Report* 15 (2): 252-267. <http://www.nova.edu/ssss/QR/QR15-2/penn-edwards.pdf>
- Reybold, L. 2008. "Practitioner-faculty dialectic: balancing professional identities in adult education." *Journal of Adult Development* 15: 140-147.
- Richardson, L. 1994. "Writing: a method of inquiry." In *Handbook of qualitative research*, edited by N. Denzin and Y. Lincoln. Thousand Oaks: Sage Inc.
- Richardson, L. 2000. "New writing practices in qualitative research." *Sociology of Sport Journal* 17: 5-20.
- Rorrison, D. 2002. "The political, public, personal and private female teacher exposed. How to recognise the politics of your teaching and identify the spaces where contestation and struggle are possible, no, necessary!" Unpublished Master diss. Flinders University of South Australia.
- Rorrison, D. 2007. "Jumping through spinning hoops. A critical view of learning in the secondary practicum." Unpublished PhD diss., Charles Darwin University.
- Schostak, J. 2012. "Schooling and education after neoliberalism." *Power and Education* 4 (3): 251-253. <http://dx.doi.org/10.2304/power.2012.4.3.251>.
- Shin, C., and J. Jung. 2013. *Higher Education*. 67: 603-620. doi:10.1007/s10734-013-9668-y.
- Sinner, A. 2013. *Unfolding the unexpectedness of uncertainty creative nonfiction and the lives of becoming teachers*. ISBN: 9789462093546. Rotterdam: Sense Publishers.
- Smith, A., and M. Humphries. 2006. "Evaluation of unsupervised semantic mapping of natural language with Leximancer concept mapping." *Behavior Research Methods* 38 (2): 262-279.
- Smyth, J. 1989. "Developing and sustaining critical reflection in teacher education." *Journal of Teacher Education* 40 (2): 2-8.
- Stets, J., and P. Burke. 2003. "A sociological approach to self and identity." In *Handbook of self and identity* edited by M. Leary and J. Tangney, 128-115. New York: Guilford Press.
- Yates, L. 2004. *What does good education research look like? Situating a field and its practices*. Maidenhead: Open University Press.

[Back to contents](#)

## **Practicum as a site of identity and efficacy development through participatory and enhancing conversations**

*Doreen Rorrison*

*Charles Sturt University & University of Adelaide, Australia*

*drorrison@csu.edu.au & doreen.orrison@adelaide.edu.au*

### **Abstract**

The practicum in teacher education has been under-theorised and framed through taken for granted traditional understandings. The research and analysis of an international collaboration of which I am a member has identified a practicum “turn” and a tentative framework for developing understandings of practicum practice and processes. We have developed an interactive website for Practicum Research and Development and a participatory action research project to compare and learn about the communicative spaces during the practicum in teacher education in several different countries and educational traditions. Our findings question the current trends and turns in teacher education that are based on accountability measures or definitive lists, and call for a fluid, knowledgeable, practice informed and enacted experience for preservice teachers who are afforded the space and empowered to learn in and from practice. For this we conclude we need a paradigm shift in the way we talk about learning teaching.

**Keywords:** practicum; communicative spaces; preservice teachers; teacher education; action research.

### **Context of the research**

Practice learning models in teacher education differ across international traditions, between higher education institutions and even within a single university. The time, timing and structure of professional experience (practicum) in schools also vary, as does the preparation of the supervisors or mentors. Yet it is agreed that classroom experience is an important component of “learning teaching” (Lambert 2010, 22). This paper provides background to some of the changes that have occurred, analyses why they have occurred, and most importantly traces the recent re-turn toward practice and its implications due to the absence of a clear theoretical framework. Since the move to closer partnerships between university and school based preservice teacher education that clearly facilitates practice learning in practice, we are now experiencing a call for school-based management of teacher education. Indeed school-based programs can now be added to on-line courses and the re-emergence of graduate direct entry models, as under-researched aspects of policy change. In essence there have been strong arguments for all of these developments but when the essential elements of learning teaching begin to disappear within the different models we need to ask questions about the pedagogy development, understanding and learning experiences of the new generation of teachers. While the knowledge of teacher educators should be research based and theoretically grounded through deep engagement with their own teaching practice and the wide range of preservice teachers, schools and models they work with, the knowledge of practicing teachers is generally contextual and practice based. As experienced practitioners both have an important role to play in the education of preservice teachers. Teacher educators can also support practitioners who mentor preservice teachers and provide guidance to governing bodies. A “turn” where the role of teacher educators is diminished or marginalised in initial teacher education causes major concern to those of us supporting the essential role of practice in teacher education but also cognisant of the important and unique role of theoretically grounded and socially just understandings.

### **Theoretical framework**

In an international practicum network discussion (Pedagogy, Education and Practice (PEP) Conference, Gold Coast, Australia, 25-29 November, 2012) it became obvious that changes in



policy (possibly due to fiscal and accountability pressures on the sector) were reducing the opportunities for conversations between preservice teachers and teacher educators. We had just published an edited volume with the title “A Practicum Turn in Teacher Education” (Mattsson, Eilertsen, and Rorrison 2011), where practice based, relational and discursive models of learning were shown, through a range of empirical research projects, to be the most effective for preservice teacher learning and development. We were committed to maintaining high levels of support for preservice teachers, teacher educators and mentors and were concerned by the threat to practicum conversations. This led us to create an international participatory action research project to analyse and evaluate the communicative spaces during the practicum as a way to provide research evidence of their role in the learning process of teachers.

I have discussed elsewhere (Männikkö-Barbutiu and Rorrison 2011; Rorrison 2008, 2010, 2011) the complexity of practicum learning and learning teaching and the irony of the now popular notion that bureaucrats or policies can “solve the problem” of initial teacher education. After a lifetime in education, teaching and researching in many schools and universities in three countries, I still have no definitive answer as to which methods, practices, understandings and values resonate most productively when teaching teaching. Every practicing teacher and each prospective teacher has strengths, practices and dispositions that can both endear and alienate them, depending on the setting, situation and attitude of those around them. There appears to be no research evidence that a particular model of teacher education, or particular roles and dispositions of teacher educators, provides for more productive or generative teaching of teaching. There has certainly been an era in teacher education in Australia where there was pressure to “clone” teachers who were considered “effective” in the view of some. Then we started to “mandate” and test these skills through “competency based assessments”, “teaching schools” and more recently “Standards and Procedures: Accreditation of Initial Teacher Education in Australia” (MCEECDYA 2011) and “National Professional Standards for Teachers” (AITSL 2012), with the misguided belief that testing and accountability measures could guarantee quality teachers. The complexity of these documents alone mitigates their success.

Even the more recent “turn” towards learning practice in practice (see Furlong and Lawn 2010; Lampert 2010; Mattsson et al. 2011; Zeichner 2012), as a response to accommodate changing societal expectations, new views of education and quite different cohorts of pupils and teachers, has been interpreted in a range of different ways. While the fiscal and policy climate has been influenced by global comparisons, competitiveness and neo-liberal pressures that have resulted in a discourse that supports only what appears efficient and accountable, we are aware that our own support for a practicum “turn” may have resulted unwittingly in a belief that the schools take over the administration, teaching and assessment of preservice learning. Our call for a new conceptualisation of learning teaching (Mattsson et al. 2011) followed a decade of research with preservice teachers, inservice teachers and teacher educators on three continents. The edited volume clearly values the role of teachers in schools and the situated nature of learning teaching. The major focus however is how the novice teacher learns teaching and there are nine empirical studies reporting on seven countries with nine different findings of how this can best be achieved. In addition there are open essays from critical friends in the field from three countries, with other views and opinions. If we focus on the similarities of the chapters, rather than the differences, and the evolving theories that drew us to the conclusion of a “practicum turn” (see chapter 12) and the need for a paradigm shift, then this edition offers to the field an opportunity to move our understanding about “practice learning” forward.

Through our collaboration and discussions during and since publication a new theoretical framework for learning teaching has emerged. It becomes clear that a fluid, knowledgeable, practice informed and enacted experience for preservice teachers who are afforded the space and empowered to learn in and from practice, should be our aim. Many of the recent publications in the area of teacher education, although representing different educational traditions (ie McDonald, Kazemi, and Schneider Kavanagh 2013 (US); Mattsson et al. 2011 (Sweden, Norway, Denmark, Holland, Australia, Canada, China); Murray, McNamara, Jones, and Stanley 2011(UK); Zeichner 2013(US)) are in agreement about a “re-turn” to practice and the need to provide a framework for

theorising the practicum. Lambert’s 2010 paper, “Learning Teaching in, from, and for Practice: What Do We Mean?” discusses how the research over the previous 15 years reflects changing attitudes towards practice and enactment, while being cognisant of the role of relational practices and the integration of knowing and doing. It is a concern, however, that one of the responses to the re-turn to practice has resulted in a return to concepts like “core practices”, defined “key indicators” and other consensus models in the US (Zeichner 2012) and similar compartmentalising of the work of teaching in Australia. These are not consistent with the themes that have emerged from the analysis of our research. Such developments fail to consider fully the plurality and multi-dimensional nature of teaching, issues of social justice and the situated reflexivity necessary in teaching. They are an attempt to contain and control a field that defies such limitations. Similarly, Chapter 10 in the Mattsson and colleagues edition (2011) is a response from a critical friend in Holland (Van de Ven 2011) who, after reading the previous chapters, warns about what happens when the schools completely take over teacher education. The chapter also heralds potential problems where “partnerships” result in a reconstruction of the practicum without practice theory, learning theory or the wider perspective currently offered by teacher educators in the university.

Following the publication of the edited volume, aware of the difficulties of providing consistent language and terms in the different chapters, we immediately embarked on a project for a practicum language that we can share. We also hoped to stimulate conversations with our colleagues based on the tentative theoretical framework we introduced in the publication. Through launching an interactive website for Practicum Research and Development (<https://sites.google.com/a/dsv.su.se/pracnetwork/>) we hoped to provide an accessible site to share research and provide support for others researching and working in the field. We then introduced our vision in many forums (ATEA invited presentation, AGM, Adelaide, Australia, July, 2012; EERA, Symposium, Cadiz, Spain, September, 2012; AARE, Symposium, Sydney, Australia, 2012) and gained much support in concept. It is clear that the majority of the research related to the practicum is underfunded, local and unpublished and thus unable to make progress or an impression beyond the local sphere of influence/local context. It is also obvious that although those involved have a clear vision of practice learning, and a wish for collaboration, but the demands of their roles consistently prevents them responding to our call for action. Yet while we are able to offer little more than ungeneralisable local research and unable to participate in rigorous debate or provide evidence-based support for the practicum, we will have little to offer but our own opinions. Action is our only defense against the changing politics that are now threatening a reconstruction of practicum without deeper understandings from practice and learning theories. Our call for action has been acknowledged but sadly not prioritized by our colleagues.

Ironically it was on the way home to Australia after the ATEE Conference (Braga, Portugal, August, 2014), for which this paper was prepared, that I read the report by Strauss (September 8, 2014) in the Washington Post on the position paper of a group called Urban Teacher Education Consortium (UTECE) in the US. The activist group has wide representation throughout the US and appears to be led by Ken Zeichner. What is gratifying is that they are saying many of the things that we have been saying. They stress the complexity of learning teaching and the flawed belief that the process can be rushed or replaced or that “a new generation of teachers will emerge spontaneously” (1). The position paper questions short courses that threaten to produce “classroom mechanics” while ignoring the importance of “reflective, committed professional practitioners... grounded in deep understanding of pedagogy, human development...” (3). Clearly they are prepared to campaign for what they believe, as our international collaboration has been, and it gives me heart to continue our plans and projects.

## Research questions

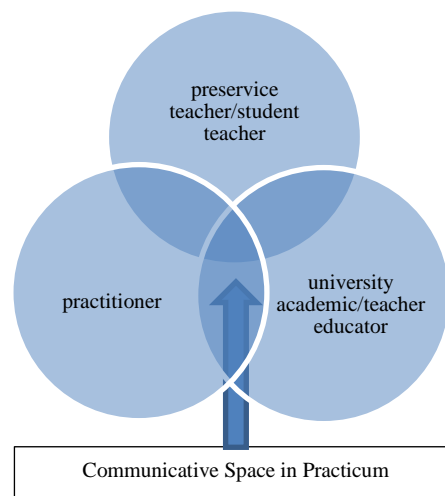
As presented earlier a group of teacher educators from six countries developed a research problem through robust discussion in a “think-tank” setting (PEP 2012). The problem was described as: What are the important participatory and empowering conversations during practicum learning?; How, in different international contexts, is professional learning being understood and

developed during the practicum conversations?

The specific research questions to help direct the research project were

- How can the communicative space be transformed to enhance the learning of professional practice?
- How can the communicative space be transformed to empower the participants?
- What are the dominant themes that emerge and how do they relate to the previous research findings of memorable/purposeful encounters?
- What can the different sites/international traditions learn from each other?

This led us to develop a participatory action research methodology and aim that would expand yet focus a practicum theoretical framework.



## Research methodology

During stage one of the project teachers/academics/preservice teachers should audio record their conversations at critical times of the practicum feedback cycle. Transcripts will then be analysed through dual discourse analysis (participant and researcher) and grounded research methods. Critical phenomena/themes that emerge will be presented during follow up meetings and participants will be supported and guided to transform their conversations in the communicative spaces in line with the emergent findings. These commitments will be documented. During the next cycle of critical feedback conversations, the agreed and documented transformative action that emerged from the first cycle will be applied and again the conversations will be audio recorded. Again the transcripts will be analysed, any changes identified, further changes recommended and documented, and the entire process will be repeated. As a true participant action research project the sequence should be repeated until saturation or the end of the process (ie graduation, change of staff etc.). The emergent themes should then be analysed in relation to the research questions and findings will be used to inform future practicum conversations as well as reported to the wider community through journals and conferences.

During stage two of the project data will be compared between national and international sites by researchers/participants who wish to remain involved at this level. Internet aided conversations will support the collaboration. Recordings, transcripts and emergent themes will be analysed for both commonalities and contrasts on both an international and a national basis (between countries and sites). Findings will be analysed through relationship with the research questions. Again there will be much opportunity to inform the field through research publication in appropriate journals and at both national and international conferences. It was decided that although the major language for communication between researchers would be English there would also be much opportunity for reporting in national languages. Collaborative papers were to be

encouraged.

## **Findings**

### ***Progress***

The development of the research project varied from country to country. Colleagues from Holland and Malta joined the project through an open invitation on the Practicum website and a strong interest in preservice teacher learning. In Sweden the planning was quite swift aided by previous contacts and presentations (Männikkö-Barbutiu and Rorrison, 2008-2012) and despite feelings of adding pressure to the lives of those involved a number of interviews were recorded (see Männikkö-Barbutiu this publication). In Holland the culture of practicum research was quite different and though the aim was similar, in reality the method and outcome developed its own more pragmatic direction and goals (see Triebels and Hennissen this publication). In Australia the process to gain ethics approval was long and complex and when finally achieved the window for the research had closed due to academic staff changes and although some interviews were conducted there was no opportunity for follow-up and the research aim of empowerment of the preservice teachers through the action-research cycle did not eventuate. Philip Bonanno’s project in Malta named “Practicum related dialogues as a transformative tool for developing digital and pedagogical competence in preservice teachers” (see this publication) shared our initial aim but developed a focus more related to the authors expertise and work role. The project in Norway also developed a life of its own as careers and positions of those involved changed and the group have not yet reported back. Projects in Canada and Columbia have not yet been developed for a range of time and career issues.

### ***So what did we learn?***

We conducted a number of Adobe Connect Internet meetings over the proceeding 18 months with mixed success. At times we could hear and see each other but the distances and range of technology we were using (from Australia, Sweden, Malta and Holland) resulted in many dropouts and delays. As a self appointed “steering committee” we also met in Sweden (March 2013) and Holland (March 2014) to advance both projects and report our progress to the local universities and invite wider involvement.

In terms of the research project(s) we found that in the majority of the taped conversations the teacher educator was too present and too directive, almost always taking the lead and filling the space with their views, understandings and guidance. There was little sense of the preservice teacher apart from agreement, acknowledgement of the comments of others and answers to specific questions. They were generally a spectator to the conversation and appeared to be carefully monitoring their responses as if they were being assessed and they knew what their mentors wanted to hear. As in many currently published research reports (see for example Ell and Haigh 2015) the entire experience was summative, not a formative or a participatory learning experience, as there was no opportunity for the feedback action cycle (stage 2) in an endpoint conversation.

We remain committed to the potential of participatory action research as a way to enrich practicum conversations and we are now investigating ways of opening up more “communication spaces” during formative encounters. To date we do not have evidence to support our contention that the role of the conversations with teacher educators during the practicum is either vital or empowering. Like Ell and Haigh (2014) we found the focus to be on assessment and issues of power and social justice (6) were not transparent. If, as they claim, “assessment in practice settings is becoming increasingly significant in determining who gets to teach” (11) and these communicative spaces are part of the judgement process, we need to modify our research plan. We need to investigate ways to ensure there is ample opportunity before the “assessment phase” for preservice teachers to benefit from targeted feedback conversations and the participation and empowerment possible from action research.

## Conclusions and implications for teacher education

In summary we found that the communicative spaces in teacher education that we researched are not providing the preservice teachers with the participatory or empowering experiences we had hoped for. Our previous study (Männikkö-Barbutiu and Rorrison 2011) where preservice teachers narrated about “memorable moments” during the practicum provided more accessible, reflective and critically reflexive responses and insights. It appears that “conversations” with teacher educators during the practicum are not developmental for preservice teachers but are more likely to be inhabited by the teacher educators and seen as a time of judgement. With the practicum playing an increasingly important role in teacher education, can we reframe the conversations to provide the learning support and guidance we believe teacher educators should provide? Or has the practicum “turn” backfired and marginalized the teacher educator and added to the responsibilities of the classroom teacher as mentor?

Clearly the “re-turn” to practice, though theoretically sound, portends some danger. If we are unable to bring together sufficient critical mass to prevent the reactionary outcomes that will move us back half a century to competency lists, instructions and rehearsal approaches, then we are lost. If we cannot change the way we frame our conversations we are at risk of failing to provide preservice teachers with the deeper knowledge gained from learning and teaching theory. What we need is a new way of looking at old problems, a paradigm shift that confronts taken for granted frameworks and replaces them through problematising and situating our thinking to reflect new and critical principles. There is no one answer to the complex and multi-dimensional field of teaching and learning teaching and it remains important that we actively reject plans to explain or tame the field through neo-liberal doctrines.

## References

- Australian Institute for Teaching and School Leadership (AITSL). 2012. *National Professional Standards for Teachers*. <http://www.aitsl.edu.au/australian-professional-standards-for-teachers>
- Ell, F. and M. Haigh. 2015. “Getting beyond “gut feeling”: understanding how mentors judge readiness to teach” *Asia-Pacific Journal of Teacher Education*, 42 (2): 143-155. doi:10.1080/1359866X.2014.934200.
- Furlong, J. and M. Lawn. 2010. *Disciplines of education: their roles in the future of education research*. London: Routledge
- Lampert, M. 2010. “Learning teaching in, from, and for practice: What do we mean?” *Journal of Teacher Education* 61 (1-2): 21-34.
- Männikkö-Barbutiu, S., D. Rorrison, and L. Zeng. 2011. “Memorable encounters: learning narratives from preservice teachers’ practicum in Sweden, Australia and China.” In *A practicum turn in teacher education* edited by M. Mattsson, T. Eilertsen, and D. Rorrison. Rotterdam: Sense Publishing.
- Mattsson, M., T. Eilertsen, and D. Rorrison. (eds) 2011. *A practicum turn in teacher education*. Rotterdam: Sense Publishing.
- Ministerial Council for Education, Early Childhood Development and Youth Affairs (MCEECDYA). 2011. *Accreditation of initial teacher education programs in Australia: standards and procedures*, MCEECDYA. [http://www.aitsl.edu.au/docs/default-source/default-document-library/accreditation\\_of\\_initial\\_teacher\\_education\\_file](http://www.aitsl.edu.au/docs/default-source/default-document-library/accreditation_of_initial_teacher_education_file)
- Murray, J., O. McNamara, M. Jones, and G. Stanley. 2011. “Research capacity building in teacher education: a case study from England.” Paper submitted for inclusion at the European Educational Research Association Conference, Berlin, September, 13-16.
- McDonald, M., E. Kazemi, and S. Schneider Kavanagh. 2013. “Core practices and pedagogies of teacher education: a call for a common language and collective activity.” *Journal of Teacher Education* 20 (10): 1-9. doi: 10.1177/0022487113493807.
- Rorrison, D. 2008. *Jumping through spinning hoops. Stories of the middle school and secondary*

*practicum*. South Melbourne: Cengage Learning Australia.

Rorrison, D. 2010. “Assessing the practicum in teacher education. Advocating for the student teacher and questioning the gate keepers.” *Educational Studies* 36 (5): 505.

Rorrison, D. 2011. “Border crossing in practicum research. Reframing how we talk about practicum learning.” In *A practicum turn in teacher education*, edited by M. Mattsson, T. Eilertsen, and D. Rorrison. Rotterdam: Sense Publishing.

Strauss, V. 2012. Washington Post <http://www.washingtonpost.com/blogs/answer-sheet/wp/2014/09/08/we-must-push-back-against-the-misguided-and-dangerous-belief-that-a-new-generation-of-teachers-can-emerge-spontaneously/>

Van de Ven, P-H. 2011. “Reflections from a Dutch perspective.” In *A practicum turn in teacher education*, edited by M. Mattsson, T. Eilertsen and D. Rorrison. Rotterdam: Sense Publishing.

Zeichner K. 2012. “The turn once again toward practice-based teacher education” *Journal of Teacher Education* 63 (5): 376-382. doi: 10.1177/0022487112445789.

[Back to contents](#)



## **Teaching literacy, numeracy and ICT to adults: the basic skills programme (BKA program) for workers in building construction (bricklayers, carpenters and foundation workers)**

*John David Holt & Kurt Einar Stokke*

*Oslo and Akershus University College of Applied Sciences, Norway*

*john.holt@hioa.no & kurteinar.stokke@hioa.no*

### **Abstract**

The purpose of this paper is to present results of experiences that brings forward the theme of educating teachers for the 21<sup>st</sup> century teaching challenges, among them the education of adults in the working life. The rationale for the experiences is hereby briefly presented. There is today a high pressure for updating skills of the work force. Skills in literacy and numeracy, often called basic skills, together with ICT have been the focus of lifelong learning activities aimed at employed/unemployed adults. Different international surveys and studies point out that lack of basic skills is a widely spread phenomenon in several trade sectors of the work force. Lack of basic skills is also observed in Norway. Results from our experiences expected to increase our knowledge and understanding of teaching and learning challenges faced by teachers and teacher educators in vocational education and training.

**Keywords:** teacher education; adult learning; technical and vocational education; basic skills in vocational education.

### **Context of the research**

The context for investigation is to see the relationship between basic competence in the life of work for adult learning and basic skills for student learning as two parallel societal tasks where the teacher's competence is central.

There is currently a strong pressure to update skills of the Norwegian workforce. Many workers need greater expertise to perform tasks that are constantly changing and/or becoming more complex. In the construction industry, for example, the workers experience constantly new documentation requirements for quality control, Health, Environment and Safety (HES) (Saksvik and Nytrø 1996).

The Norwegian National Agency for Lifelong Learning (VOX) is responsible for the program Basic Competence in the Working Life (BKA program). It aims to facilitate increased participation in employment and society. BKA-training will help increase participants' skills in reading, writing, and numeracy and ICT usage (Kunnskapsdepartementet 2000).

By emphasising competence development focused on basic skills in the technical and vocational teacher education (TVTE) at Oslo and Akershus University College (HiOA), we believe we can contribute to engage more technical and vocational teacher educators in the development of basic competences of adults in the work life. During the implementation of the BKA program, the vocational teacher educators involve the course participants in the process.

Anchoring is important for finding out which skills the participants already master, what they want to learn more about, and how participants believe they learn. In addition, it is important that the anchoring phase will ensure self-confidence to the individual participants. They are the ones who are involved in the learning and development process and who must feel that the activity relates to their own reality. The learning process should not be experienced as something strange. According to Innbjør and Kleiveland (2007), the feeling of safety given by the anchoring is a factor for learning during the implementation of skills development at the workplace.

In our job as teacher educators at the TVTE program at HiOA, we wish to highlight some basic ideas related to vocational education that illustrate how the development of adult skills can be strengthened with a didactical approach aimed at professions Hiim and Hippe (2001), Haaland and Nilsen (2013). We believe that the teachers' qualifications in their occupations together with a



democratic teaching approach is central to the learning effect. It seems that a democratic way of thinking that has the occupational tasks as a starting point is important for increasing the participants' intrinsic motivation Imsen (2014) and (Sylte 2013). We expect that results from the investigation together with our experiences will contribute to increase our knowledge and understanding about the challenges that our teacher-students and we, as technical and vocational teacher educators experience each day, and especially when relevance and meaning are discussed.

### **Research aims**

In this paper, we wish to highlight the following question of our study: Why shall the vocational teacher be in charge of adult learning when teaching basic skills in the work life? The purpose of this article is to present research and experiences that illustrate how vocational teachers can contribute to the education of adults at the workplace.

In recent decades, technology has had a major impact on employment. “From brawn to data management” is an expression that exemplifies changes in the production industry. The rapid technological developments mean that it can be difficult to identify occupations that existed just a few years ago. Former workers worked primarily with crafts, they have today an expertise that can be useful in various types of tasks. The overall digital skills of these workers may be so high that they are attractive to employers (Karstensen 2014).

An investigation about the effect of BKA in the construction industry shows that customized training programs for each individual company gives the best results. The course leaders together with the companies involved in the study tailored courses to the companies' systems and routines, and to their daily tasks (VOX 2012). Surveys and own experience support the affirmation that the involvement of vocational teachers, who know the profession well, can contribute to good results in the training of adults in basic skills. According to Knowles (2012), in Kolb (2012), such participation is important because the learning activities can have the professional duties of each participant as a point of departure, which makes their usefulness to be immediately visible.

### **Theoretical framework**

Vocational teachers bring with them practical experience whose emphasis lies on basic skills as part of vocational training for upper secondary/ pupils (Utdannings- og forskningsdepartementet 2003-2004). In practice, this means that vocational teachers will help their pupils to develop skills in reading, writing, numeracy, and ICT usage. A framework of the Norwegian Directorate for Education and Training describes a taxonomic division of competence levels in basic skills (Utdanningsdirektoratet 2012). The framework of the National Curriculum for Knowledge Promotion is designed on an overall level and it should be used as a tool and reference for developing and revising syllabuses for subjects in the various levels of competence. Furthermore, it will help to make visible the basic skills out of the uniqueness and purpose of the subjects. At work, it is important that the work tasks set the conditions for training. Therefore, syllabuses in the various educational programs have own descriptions of what is included in basic skills.

The advantage of being vocational teacher is that the background of the individual differs from the other Norwegian teachers in two significant areas. One is that vocational teacher has a high school education as a minimum of two years in school and two years of employment. The second is that after having received a course or examination must vocational teacher has a minimum of two years' experience as a professional in the field before he/she can apply for vocational teacher education. Vocational Teacher Training consists of a three-year bachelor's degree at a college or university that integrates subjects, pedagogy and didactics (Brevik and Lier 2013).

As vocational teacher educators, we should be able to facilitate learning in which vocational student teachers become reflective practitioners. This means to take into account that, as a starting point, the learners are competent within their trade areas, and that they will develop their analytical skills through by reflecting over their own practice (Schön 2012). The challenge for the learners is

to develop a conscious practice, within which the focus on basic skills creates the basis for life-long learning, and our goal implies, the participation of adult learners in the BKA-courses.

The starting point for the implementation of the courses was experiential learning as the basis for adult learning. Adults have different background and start in a learning activity with experiences from their past. When carrying out the learning activities, adults have often an immediate application perspective as a goal. It is necessary then to emphasize their life situation in the learning activities, which should be problem-oriented (Knowles 2012). Dialectical processes that integrate experiences and concepts, observations and action provide the basis for a model for experiential learning. The vocational teacher in charge of the practice applied the model that emphasized the participants' background, which provided the basis for reflection and generalization through theoretical input. Such approach laid the foundation for trying out new practices. Kolb (2012) inspired the implementation of the model. The experience loop (Figure 1) provides a perspective on learning that suggest that it is not knowledge coming first and then developing into expertise. Knowledge and expertise go together in this perspective while one is moving. It is through change efforts that the individuals acquire knowledge. For experiential learning to take place, the individual learning process must provide the basis for the content and implementation of the course sessions.

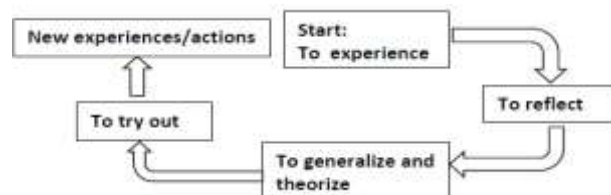


Figure 1. Learning from experience loop, inspired by Kolb in Illeris (2012)

We believe that focusing on the methodology of the study program can help future teachers become more reflective of their own practice. In addition, participants can develop their own reflection in action (Schön 2012). Using question, write/talk about their own practice and be observers in their own and each other's practice, we can get an individual metalearning. "Metalearning implies an excess of previously developed understanding, and this understanding in mind and leads to an overall understanding on a general level" (Illeris 2000, 51) our translation.

## Research methodology

Through a comparison of different studies and documented experiences, we are able to find out more about how and why our methodology should be further developed in the TVTE program at HiOA. The problem is highlighted by three selected sources:

"Source 1. Systematic documentation of personal experiences with input from participants that completed BKA-course in the period 2011-2013. It was conducted along and final assessment of BKA- course. Implementation and content were examined using questionnaires. The results presented in this context is the same as was discussed now and the participants."

"Source 2. Experience from industry-oriented cooperation on training in basic skills, VOX (2012). - An evaluation of projects in collaboration with BNL, (Byggenæringens Landsforening). This survey is based on interviews conducted with participants and project managers. In each five projects were conducted two interviews with participants and an interview with the project manager" (VOX 2012, 3).

"Source 3. Evaluation of the Programme for Basic Competence in Working Life - From Proba social analysis for the Ministry of Education (Proba 2012). The evaluation is based on a survey of employers who have employees BKA courses and a survey of attendees at the same courses. The starting point was the course of 2008-2010. It was also seen what effects the employers have had to have staff at the BKA courses. (Proba 2012, 7). Common sources is that they have looked at whether BKA training has been effective for the participants. In addition, studies have considered the needs participants to develop basic skills and what experience they have with BKA courses."

### ***Our base for BKA training for source 1***

The teaching in the courses of basic competence at work carried out in the enterprises and it had, as a starting point, the main tasks of the participants' occupations. This means that the basic skills were included in the program as required qualifications to solve practical work. The reason for such approach is the relevance and meaning it gives for the participants, while, concurrently, the companies involved in the program get something back for the time used in the employees' education. By comparing teaching and learning within BKA, which focuses on the requirements for how vocational teachers shall plan, implement, evaluate and reflect about the educational programs in the work environment, and the teaching/learning at schools, the goal is, eventually, to illuminate the similarities and differences between teaching/learning that takes place at schools and in enterprises.

The following points present and describe the point of departure for the teaching activities carried out by the teacher in technical and vocational education.

- The challenges and tasks had the BKA-participants' professional practice as point of departure. This means that the participants' experiences from the practice field had a central role in the learning process, and the participants learned through working with realistic tasks and situations.
- BKA participants were to become more aware and able to express their experiences and thoughts in / and about different situations. An example of this could be to gain insight into the consequences of insufficient planning, which in turn could result in poor workmanship.
- One of the objectives was to increase the awareness of BKA participants of their experiences and acquire new experiences together with others from the same profession/occupation. Through planning, testing and reflecting about new situations, the participants should increase their awareness and range of actions in various circumstances.
- BKA participants learned that the examples were analysed (from a professional context), processed, applied and generalized for using in their own practice, for example by increasing the use of digital tools as a means to advance professional competence. Participants had to problematize and present what they had been working on, or learned, to each other.
- BKA participants answered questions about their expectations for the course and their learning according to their needs. In this way, they participated in the planning of activities for course sessions within the given framework.

There was also assessment of situations during the implementation of the course, in order to adjust the content and processes according to the needs of the participants. Course participants' involvement also contributed to the value orientation where both trainers and participants became more aware of their own norms and attitudes in relation to professional ethical standards, and the importance and consequences of their own choices.

## **Findings**

### ***Source 1***

Table 1 shows the results of the assessment of BKA courses taught by vocational teachers. Part of the time, approximately 35%, was used for input from the company itself and lectures by other professional speakers. All lecturers/teachers had qualifications from the professional area. The course took place in the period 2011-2013.

The respondents assessed the course on a scale from 1 to 6 (6 being the best). The highest possible score was 72.

The participants calculated, wrote, spoke and used ICT to plan, to organize the implementation, and to prepare documentation and assessment of occupational tasks. As a starting point, the course utilized part of the company's quality system and internal control system for

activities carried out as part of the daily work.

Table 1. Results of assessment after completion of the BKA course carried out by a vocational teacher

Items	Score
The level of knowledge of teachers	65
The way to present the material	56
The extent to which you have learned something new	58
The extent to which you have learned something new	56
The extent to which the course was useful for you	53
The overall impression of the course	59
To what extent would you recommend the course to others	55

Therefore, the health, safety and environment (HSE) had a special place in some of the sections. Table 2 shows what participants said about the distribution of content in the course.

Table 2. The courses' content (Answers from same participants as in Table 1)

Contents	Little	Average	A lot
Reading and writing	-	12	-
HSE	-	9	3
ICT	6	6	-
Calculations	3	9	-
Improvements in the work place	3	9	-

## Source 2

Experiences/results from industry-oriented cooperation on training in basic skills (VOX 2012). Shows that the construction industry is characterized by oral rather than written communication. Nevertheless, the interviews indicate that the management and staff were aware that increased written form could be worthwhile.

“I did a survey [among participants from small businesses] to see how many people used written contracts ... There was little use of it. The majority had a quality assurance system, but not everyone used it. That was not entirely surprising, as our goal was to increase the amount of its use. We see that either many entrepreneurs lose money for not getting contracts or on the contracts, they get. The reason might be that they either do not have a contract or have a bad contract. We wanted a greater focus on the use of contracts, and not least, on the content of the contracts.” (VOX 2012, 4).

Although use of written communication seems to be low in the sector studied, awareness is high around the administration and planning staff. Several respondents connect good progress and economic profitability to good planning. Out in the construction site it is all about obtaining the right equipment at the right time in order to avoid idleness and direct economic losses “... It is 100% focused on efficiency and progress, because that is where you are competitive ... that you are able to maintain a good flow to it. Stops it up, then the crowns start to roll ... unnecessarily” (VOX 2012, 4).

The following quote illustrates the importance of the teaching being grounded in the occupations, as expressed by a project leader after completion of the course.

“There is no one who had the impression of attending a Norwegian language course or a math course. The reason was that they experienced the direct application of the calculations that they had to do. And I feel that this is the key to motivate participants to start attending the course and participate in the whole course. They have to recognize themselves in some of the work they carry out daily. For what I say, we should not forget that the employees or trainees are used to working outside and do physical work in all kinds of weather. They are not used to sitting still in a classroom a whole day and one must take this into consideration.” (VOX 2012, 10).

When asked about the results obtained from the course, the participants gave the following feedback:

- new production systems and less wastage;
- new tasks and responsibilities;

- new supervisors and resource persons;
- competitive advantage in regard to bidding;
- increased use of written contracts;
- increased use of quality assurance systems and better management;
- increased awareness of safety and security in the workplace;
- better integration and greater understanding of ethnic minorities.

Participants in the survey was asked to think about sector changes in the previous 5-10 years and indicate which features they thought would be strengthened five to ten years into the future. The following points are suggestions that emerged from the interviews:

- increased demands on documented knowledge of individual employees;
- an ever increasing demand for general documentation;
- increased responsibility of each individual towards the supply chain and in regard to the quality of work execution;
- documentation and customer satisfaction;
- increased specialization and more niche markets;
- emphasis on environment and climate in relation to the execution and product development;
- a good reputation and good references, generating new jobs;
- change attitudes about vocational education.

### ***Source 3***

Results from Proba social analysis (Proba 2012), a survey conducted for the Ministry of Education, indicate that the course participants were highly satisfied with the BKA - courses. The majority of participants felt that the course was tailored to their own tasks and needs. Most participants were satisfied with the teachers and the course as a whole. To assess the effect has Proba Social Analysis concentrated on the areas where participants needed to learn more, and examined which effect the participants and employers believed that course participation had on the relevant areas. The summary of Proba social analysis shows which factors the employers believed had the greatest impact upon completion of the BKA-course. There was a greater effect if:

- the enterprise had previous experience with on-the-job training;
- the company itself applied for BKA funding;
- it was easy to recruit participants;
- the company used its own employees in the teaching (or together with people from outside);
- teaching took place totally or partially during working hours, only leisure had lower effect
- training was adapted to the company's operations.

BKA course participants believed BKA courses are most effective if:

- there were conversations with the teacher prior to the startup;
- participants were encouraged to participate, but it was voluntary;
- training was tailored to the participant's needs.

### ***Discussion***

According to the information obtained from our respondents and our experience, it can be very important for the development of basic skills among the participants that teachers in BKA-course have a vocational qualification. We will further discuss how BKA courses can be conducted with an emphasis on the participants' professional expertise and democratic methods. Our proposal is to start the courses with an anchoring on all the involved participants and focus on the pedagogy for vocational education. Briefly, it can be said that the vocational profile in this context means

getting away from the outer society’s expectations to the inner needs of the individual when we refer to skills development within a company. In andragogy, the role of the teacher is redefined from being one who teaches to one who is a consultant and resource person (Knowles 2012). The implementation of the BKA-course with vocational teachers shows that vocational teachers prioritize content, and conduct learning processes based on professions core tasks, even when developing basic skills in the workplace. The results show that a participant-oriented approach with occupations in the centre gave a good balance because the course had content that made sense to the participants. The importance of occupation anchoring for motivation is supported by Hiim and Hippe (2001), Sylte (2013), Haaland and Nilsen (2013). We believe that this is related to the fact that vocational teachers work with a wide choice of educational programs that lead to various professions, in which basic skills should also be integrated to the learning activities (Utdannings- og forskningsdepartementet 2003-2004). At the same time, vocational teachers aim to emphasize the correspondence between training in basic skills and the professional practice as reflected in the occupation.

Nevertheless, the studies that we use in our discussion support this practice very strongly. Therefore, we have decided to use one of the sources, i.e., courses completed with a vocational teacher. The results show a high degree of satisfaction among participants both in terms of results (Table 1), and the distribution of academic content (Table 2). We attribute the results to a democratic practice with a high degree of participant orientation in the implementation of the course. The survey of learning conditions before the course starts, or in first meeting, makes the participants feel seen and heard. This is substantiated by the investigation presented under Source 3 from (Proba 2012) in which the participants responded that the conversations with the teacher before the course started and the tailoring of training to their needs were central to the learning effect.

In the implementation of various courses presented under Source 2 (industry-oriented cooperation) the responsibility for the course has been a combination of vocational teachers and the industry itself. The core of the investigation was industry connection for trainers/teachers. The courses were based on conversations between participants and trainer before the start. Corporate representative had the following statements about the anchoring of course:

“... And this, I feel, is the key for motivating participants to get on the course and to participate in the course. They must identify with what they do every day. What I wish to say is that we should not forget that employees or trainees are used to work outdoors and perform physical work in all kinds of weather. It must be taken into consideration that they are not used to sitting still in a classroom situation the whole day.” (VOX 2012, 10).

In our opinion the statement shows that, in addition to the academic anchoring, the understanding of the cultural context of the occupation is central to the learning process with adults in the implementation of the BKA-courses in the construction industry. The understanding of what is often termed as “workmen’s chat” on construction sites can be key in order to communicate with the workers in the industry. According to Innbjør and Kleiveland (2007), to establish good learning environment the course participants should feel that they are met in their everyday life experiences.

Furthermore, during the implementation of various courses, statements from the staff indicate that the impact of learning outcomes was observed in an increased use of quality systems, greater awareness about health/environment/safety in the workplace, new manufacturing solutions, and less wastage (Proba 2012). The results point directly toward the performance of professional work in the enterprise. In addition, some participants mentioned that they could accomplish new tasks and responsibilities, had competitive advantage in bidding, and the possibility of becoming supervisors and resource persons in the company. The examples taken from the participants’ statements show that the BKA courses under managers with background from occupations, contributed to development of important basic skills that basic skills that go beyond writing, communication, numeracy and ICT. Improved self-esteem and increased motivation to take responsibility may have been a side effect of the BKA-course carried out in the construction industry. Knowles, in Illeris (2012), support the practice of developing self-understanding through active participation.

In the study of Proba social analysis, respondents from the enterprises indicate that the high efficacy of the courses was due to: a) the involvement of own employees in the teaching, combined with external lecturers and teachers, and b) tailoring of the teaching/learning to the needs of the enterprise. The findings substantiate the affirmation that relevance to and knowledge about the enterprise and tasks in the occupations is central. We see that the findings of the survey corresponded with statements from the industry concerning experiences from industry-oriented collaboration (source 2) “... There is no one who has the feeling of attending a course on Norwegian language, or a math course, because they have experienced the direct application of the calculations that they had to do ...” Project trade association (VOX 2012, 10).

We see once again the results of occupational anchoring in the survey presented in source 1, especially about teachers perceived as having high level of knowledge. On the basis that basic skills consist of reading, writing, use of data and arithmetic, then the vocational teacher can encounter academic challenges such as in languages and mathematics. Especially if professional standards/subject knowledge is only considered in relation to teachers in various disciplines such as tasks in Norwegian language and mathematics. We nevertheless believe that this takes second place when starting point for courses is built around improvements at the own workplace, the enterprise’s quality a system, and health/environment/safety. We think that the advantage coming from the teacher's professional background in the field is more important than formal background in academic subjects. In adult learning, the learner and the teacher should share the responsibility and be equal for learning having a good effect. Contrary to teaching

“... and in accordance with the adult self-perception as being autonomous, the andragogy practice deals with the transaction between learning and teaching as a shared responsibility of the learner and the teacher. In fact, the role of the teacher is redefined as a consultant, resource person and “co-investigator”. (Knowles in Illeris 2012, 564).

We observe, therefore, that the methods of experiential learning with theoretical input may be the way to go when working with adult learning, a practice, not least, supported by Kolb, in Illeris (2000). By active participating in the development of the course, trying out and reflecting about new situations, the participants were able to increase their own awareness and range of actions in varied circumstances. The participation of vocational teachers in the learning activities contributed to greater awareness of the participants’ own practice, as described by Schön, in Illeris (2012). Throughout the course, participants had to problematize and present what they had been working with and had taught each other. Using ICT as a tool in a vocational context did this. Participants had to adapt, apply and generalize the application of ICT for using in their own practice as a means to increase professional competence. We have interpreted the participants’ words that they could receive new work tasks, have new areas of responsibility and also have the possibility of becoming new supervisors and resource persons in the company (Source 2), as expressions of being reflective practitioners who see themselves in a new role within the company. By setting up inner motivation and reflections about the situation, experiential learning has helped the participants to see themselves in the implementation of new practices, see (Kolb 2000), in Illeris (2000).

## **Conclusions and implications for teacher education**

BKA course is offered to those who are left behind after “the train has gone by”, especially considering ICT and practical application of this tool. Digital competence is important at the workplace, for private life and for participating in society. It is important for the participants to gain insight into the possibilities and limitations located in the “ICT tool”, both in terms of reading, writing and arithmetic. We claim that using teachers who know the sector and the vocational subjects in BKA courses provides a common thread for the acquisition of basic skills among course participants. This practice may for many people, be a new and revolutionary thought when the tradition is that common core subjects such as reading and writing (language subjects) and mathematics, have often been disconnected from occupational tasks. Subject teachers are traditionally used for teaching, for example, writing and arithmetic. When there is a need for

developing basic skills and course participants have “ownership” of the content, they become confident for being part of the process, have greater commitment and are motivated. We believe that the working methods of vocational teachers can be used in multiple contexts when education is carried out at the workplace.

Concerning Oslo and Akershus University College, our development efforts might contribute to broader cooperation with associations and enterprises. Signals are already given that the academic community is open to participate in development projects together with companies and training providers. Contacts will also be established. Many effects of the work done can be described, but there is still a lot not yet detected until more work is done. Holistic thinking based on basic skills appears to be motivating for the participants. In addition, the usefulness of new skills will be central in the individuals’ private life.

We believe that the experience of confidence in the anchoring/start of the BKA-course is the most critical for learning outcomes during the implementation. In the anchoring phase, it is important to have a transparent process during which the people involved can explicitly see how the need for expanded expertise has emerged through new requirements for workers. A democratic process is crucial for ownership of the course during its completion, which will also be crucial for its relevancy and meaning for the participants. Furthermore, we believe we have documented something about the necessary preparatory work and implementation of such teaching based on own experiences and some research. We hope this will lead to a debate on whether this will, or should, be part of our vocational teacher education. Different questions may arise upon this review and discussion.

## References

- Brevik, B., and A. Roar Lier. 2013. “Technical and vocational teacher education practice: profession or semi profession?” In *Proceedings of the 37th Annual Conference of ATEE: Teacher Education Policies and Professionalisation*, edited by E. Agaoglu, C. Terzi, C. Kavrayici, D. Aydug, and B. Himmetoglu, 102-109. Brussels: ATEE aisbl.
- Haaland, G., and S. Nilsen. 2013. *Læring gjennom praksis: innhold og arbeidsmåter i yrkesopplæringen : en grunnbok i yrkesdidaktikk*. Oslo: PEDLEX norsk skoleinformasjon.
- Hiim, H., and E.lse Hippe. 2001. *Å utdanne profesjonelle yrkesutøvere*. Oslo: Gyldendal akademisk.
- Illeris, K. 2000. *Læring: aktuell læringsteori i spændingsfeltet mellem Piaget, Freud og Marx*. 2. opl. ed, *Læring : aktuell læringsteori i spenningsfeltet mellom Piaget, Freud og Marx*. Frederiksberg: Roskilde Universitetsforl. Gyldendal akademisk.
- Illeris, K. 2012. *49 tekster om læring*. Fredriksberg: Samfundslitteratur.
- Imsen, G. 2014. *Elevens verden: innføring i pedagogisk psykologi*. 5. utg. ed. Oslo: Universitetsforl.
- Innbjør, H., and J. Kleiveland. 2007. *Operativt lederskap*. Bergen: Fagbokforl.
- Karstensen, S. 2014. “Norwegian TVET techers use of new techlogies.” In *Educating for the future: Proceeding of the ATEE 38th annual Conferance, Halden*, edited by E. Arntzen, 246-259. Brussels: ATEE: aisbl.
- Knowles, M. 2012. “Andragogik: en kommende praksis for voksenopplæring.” In *49 Tekster om læring*, edited by K. Illeris, 557-572. Fredriksberg: Samfundslitteratur.
- Kolb, D. 2000. “Den erfaringsbaserede læreproces.” In *Tekster om læring*, edited by K. Illeris, 47-66. Frederiksberg: Roskilde Universitetsforlag.
- Kolb, D. 2012. “Erfaringslæring - prosessen og det strukturelle grunnlag.” In *49 tekster om læring*, edited by Knud Illeris, 283-298. Fredriksberg: Samfundslitteratur.
- Kunnskapsdepartementet. 2000. “Programdokument for kompetanseutviklingsprogrammet.” 15. November.[http://www.regjeringen.no/nb/dep/kd/dok/rapporter\\_planer/planer/2000/kompetanseutviklingsprogrammet.html?id=102007](http://www.regjeringen.no/nb/dep/kd/dok/rapporter_planer/planer/2000/kompetanseutviklingsprogrammet.html?id=102007).



Proba, samfunnsanalyse. 2012. *Evaluering av program for basiskompetanse i arbeidslivet rapport 2012-08* Kunnskapsdepartementet: Rapport 2012-8.

Saksvik, P. Ø., and K. Nytrø. 1996. "Implementation of internal control (IC) of health, environment and safety (HES) in Norwegian enterprises." *Safety Science* 23 (1): 53-61. doi: 10.1016/0925-7535(96)00030-6.

Schön, D. 2012. "Refleksjon-i-handling." In *49 tekster om læring*, edited by K. Illeris, 345-358. Fredriksberg: Samfundslitteratur.

Sylte, A. 2013. *Profesjonspedagogikk: profesjonsretting/yrkesretting av pedagogikk og didaktikk*. Oslo: Gyldendal akademisk.

Utdannings- og forskningsdepartementet. 2003-2004. "Stortingsmelding 30 Kultur for læring." <https://www.regjeringen.no/nb/dokumenter/stmeld-nr-030-2003/2004/id404433/?docId=STM200320040030000 DDDEPIS&ch=1&q=>

Utdanningsdirektoratet. 2012. "Framework for basic skills." 18. January. [http://www.udir.no/Stottemeny/English/Curriculum-in-English/\\_english/Framework-for-Basic-Skills/](http://www.udir.no/Stottemeny/English/Curriculum-in-English/_english/Framework-for-Basic-Skills/)

VOX. 2012. *Erfaringer fra bransjerettet samarbeid om opplæring i grunnleggende ferdigheter: en evaluering av prosjekter i samarbeid med Byggenæringens Landsforening (BNL): Nasjonalt fagorgan for kompetansepolitikk*. Notat 4/2012.

[Back to contents](#)

## Mathematics labs in teacher training

*Anna Asti & Maria Dedò*

*Centro “matematita”, Città Studi Unit-Università degli Studi, Italy*

annaastimariani@gmail.com & maria.dedo@unimi.it

### Abstract

This research is part of a national project by “Accademia dei Lincei” which aims at in-service training of teachers of pre-university school. This paper intends to present a particular aspect of our research (involving teachers working with students from 6 to 18 years) in order to test the effectiveness of teaching mathematics with laboratorial kits, meanwhile using the construction of other analogous laboratorial experiences as a tool for teacher’s updating. The results emerging from this analysis show that both students and teachers benefitted from the proposed activities, but there has been a strong need of support from the Centre. The evidence is that, according to the common challenges in Mathematics Education in Europe, to achieve sustainable improvements in mathematics teaching it is necessary to support groups of teachers working together on designing, experiencing and testing learning objectives and competences.

**Keywords:** professional development; in-service teacher education; methodology; laboratory; mathematics.

### Context of the research

This paper presents research that is part of a national project (as listed on the website [http://www.lincedeistruzione.it/beta/?page\\_id=682](http://www.lincedeistruzione.it/beta/?page_id=682)) by “Accademia Nazionale dei Lincei” (known abroad as Lincean Academy), an Italian science academy founded in 1603 by Federico Cesi. It was a locus for the incipient scientific revolution. It appeared again in 1651 and was revived in 1870s as the National Academy of Italy, encompassing both literature and science among its concerns. The project, which in the school year 2013-2014 spread in many Italian cities from the North to the South, aims at in-service training of teachers of pre-university school for three main subjects: native language, mathematics and science. It is quite recent (it began a couple of years ago), although in some situations it is built on the activity of previously existing institutions which were already working with the aim of revitalizing teaching in schools. This was the case for mathematics in Milan, where the activity regarding maths has been run by the Centre “matematita”. This research centre (whose name is a play on the words “matematica” = mathematics and “matita” = pencil) is a Interuniversity Research Centre for the Communication and Informal Learning of Mathematics and has its origins in the experience of promoting mathematics by four Italian universities: Milano, Milano-Bicocca, Pisa and Trento. Based on the experience of the previous ten years of experimentation by “matematita”, the project focused on three different aspects: labs in class; problems in class; playing in class. Each of them involved teachers at two levels, one for teachers trying these methods for the first time and one for expert trainers, who had already experienced these new methodologies. This special attention to more experienced teachers aims at a long-term diffusion of these methodologies, hoping to create in this way a network of teachers who can become reference points for the less experienced teachers in their school or in nearby schools, thus multiplying the benefits of the proposed actions. This paper is specifically intended to present a particular aspect of this research (Labs in class), which involved teachers working with students from 6 to 18 years old, that is from the first years of Primary school to the end of Upper secondary. The need for revitalizing the teaching of maths and developing an in-service training goes back to the Eurydice Report “Developing Key Competences at School in Europe: Challenges and Opportunities for Policy” (European Commission/EACEA/Eurydice 2012) where it says:

“Teachers’ competences in dealing with students with a range of abilities and interests are essential in tackling low achievement. Research affirms the importance of access to effective initial education and professional development which allows teachers to select and use the appropriate methods and strategies

to suit the topic, the type of student and the particular learning context” (furthermore see e.g. Arzarello, Drijvers and Thomas 2012, 1-10).

In what follows, we will analyse only the first one of the three different aspects carried on in the project during the school year 2013-14 (Labs in class). We refer the interested reader to De Tommaso and Di Sieno (2014) for the analysis of another one (Playing in class).

### **Research aims**

The specificity of this research stands out clearly from the following purposes: to test the effectiveness of teaching mathematics by using laboratorial kits in order to improve the mathematical skills of the students; to investigate the effects of experiencing this methodology with teachers by asking them (in the years to follow) to construct other analogous laboratorial experiences and to evaluate them.

### **Theoretical framework**

When we say “Laboratorial kits”, we mean a set of materials and worksheets, designed to support work on a specific topic or problem.

“The tools to be used can be of various kinds, from the poorest and most traditional materials such as paper, squared and transparent sheets, pins, ruler and compass, to the most recent tools like software for geometry and symbolic manipulation, spreadsheets, Internet links. The mathematics laboratory environment is in some way comparable to that of a Renaissance workshop where apprentices learned by doing and seeing, communicating with each other and with teachers. With an evocative metaphor we can say that the classroom becomes like a concert hall where the students are the musicians, the teacher is the conductor and the materials that are used are the musical instruments” (see e.g. Arzarello, Drijvers and Thomas 2012, 8-9).

The reason why we decided to investigate the use of Labs in class is also related to Italian National Standards for mathematics for primary and secondary schools. For this level of classes they were published in 2012 and are now compulsory. Here Labs are intended as a methodology to construct mathematical meanings. In a document, written by the Italian Mathematics Union (UMI) and concerning mathematics curricula, we read: “A mathematics lab is not intended as a physical place opposed to a classroom, but rather as a set of various and structured activities that aim at constructing meanings of mathematical objects”.

Obviously, one of the first difficulties in introducing these new methods in schools refers to the fact that teachers themselves often never experienced a lab activity in their personal learning life; and it is difficult to convince them about some matter of facts regarding labs, unless they directly experience this possibility themselves. So, as it is widely supported by literature (see e.g. Cazzola 2008, 2009) it is necessary to provide some learning experiences for teachers before they can act as teachers themselves in a lab situation with their pupils. An example of a matter of fact which can hardly be understood unless it is directly experienced is the use of time, and the necessity of not hurrying students when they are positively involved in a given subject and maybe willing to explore it more and more. Another example is related to the benefits of communication *inter pares*, which is the normal kind of communication in a lab activity: in this kind of communication it becomes obvious that one does not have to worry about making mistakes, but the challenge is only to understand them and use them to learn more.

### **Research methodology**

#### *Context*

The project involved 121 schools and 2600 students in Lombardy. A numerical synthesis of the project is given in Tables 1 and 2. We make only a few comments here.

A first remark relates to the number of involved people (77 teachers and 2356 students, overall) with respect to different levels of schools: the highest number of participants (in terms of

teachers, but obviously also of schools, classes and students) was from primary school (41 teachers, 1061 students), then from low secondary (23 teachers, 780 students), while only a few high secondary school teachers (13 and 515 students) participated in the project.

Table 1. Data about Labs in class

Items	Primary 6-11 years	Low secondary 11-14 years	Secondary 14-19 years	Total
Teachers	41	23	13	77
Classes	79	42	22	143
Students	1061	780	515	2356
Class workload in weeks	78	57	33	168
Class workload in hours	299	144	120	563

Table 2. Data about workload of Labs in class

Items	Primary	Low secondary	Secondary	Total
Classes	79	42	22	143
Class workload in weeks	78	57	33	168
Class workload in hours	299	144	120	563
% weeks per class	0.99	1.36	1.50	1.17
% hours per class	3.78	3.43	5.45	3.94

To give an interpretation of this phenomenon, it is probably appropriate to mention first of all the fact that teachers are absolutely free to attend the project or not (as it happens for almost all the projects for in-service teacher training in Italy). There are probably many joint reasons explaining the higher numbers of participants in lower degree schools: one of the reasons is that teachers in primary school (and also many from low secondary school) are not specialists in mathematics and tend to invest many more resources in their specific training. Another reason, on the other side, is probably due to the fact that teachers of higher classes seem to be frightened by State Examination and national tests, which “check on students’ knowledge and skills”. This often (and unfortunately) means that they do not accept any project that seems to be not directly linked to the acquiring of technical skills (thus appearing as a “waste of time”).

There are some exceptions, and what we generally observe is that high school teachers who do participate to our laboratorial proposals are usually very satisfied and admit that, although apparently there may have been no direct connection between the labs activity and the technical skills required in State examination, nevertheless students acquire a different way of looking at the subject which allows them a different security (also, of course, in technical tasks). An interesting related aspect emerging from these data (see Table 2) is that the class workload in hours is quite high: so teachers of high secondary schools dedicated more time to the experimentation than the other teachers (5.45 hours per class compared to 3.78 in primary school), which seems to show a high level of commitment. Low secondary teachers used the kits in their classes 3.43 hours only, even if they had them for more than a week.

### ***Project methodology***

This section describes the methodological structure of the whole activity. Some meetings were planned with the teachers before the experimentation in class: the teachers had to work in small groups on the activities that their students would carry on later. Hence they could experience the same atmosphere and relationships as those taking place during a lab session, which is - as we already pointed out - a fundamental moment in order to involve teachers in their future activity.

In these meetings preceding the experimental activity in the classes, the teachers had also to choose the kit and they were invited to reflect on “the fact that the choice of a theme for a laboratory is a question that cannot be considered in view of a single segment of scholastic work, but must instead be addressed while taking into account as much as possible the students’ overall scholastic itinerary, from the first grades of primary school through the end of pre-university

levels” (Dedò and Di Sieno 2013, 329).

Then the teachers had some lab sessions in class with their students and in this period they could count on an online support by the researchers of the Centre “matematita” for any questions emerging by the activity.

Finally, after the work with their classes, the teachers participated in a new meeting and were requested to prepare - with the collaboration of researchers/teacher trainers - a final test in order to evaluate the intervention. The idea was not that of evaluating single students, but the laboratory itinerary carried out with the class as a group.

### ***Evaluation***

To establish the effectiveness of the project, the research group: asked the teachers - participating to the project - to fill out a detailed survey, describing all the steps of the work, comparing competences and skills before and after the activity; tabulated and analysed the answers to the surveys. The survey is available on <https://docs.google.com/forms/d/1XeYkk9M49IrDnWoHPhFgN22EuQcP5Zh8frIqoh9OWmg/viewform>

The questions range from collaboration with other colleagues inside the same school to the compliance with the details of the intervention, from the data recorded in the observation of the students at work to the comparison between the proposed methodology and the one normally used, and from the results of the final check to the impact on subsequent work in class.

### **Findings**

The feedback was positive. If we compare the proposed method with respect to other methods (mainly the traditional one) we see that - in the opinion of the participating teachers - it presents mostly advantages; this is especially true for primary and high secondary schools, while only low secondary teachers are not so enthusiastic: some numbers are reported in Table 3. The results emerging from the teachers’ answers show that the students benefitted from the activities and their skills actually improved.

Table 3. Evaluation data (%)

Evaluation	Primary	Low secondary	Secondary	Total
Mostly advantages	91	52	77	78
Mostly disadvantages	0	0	0	0
The methods are equivalent	9	48	23	22

One of the main benefits reported by teachers in their analysis is the fact that students played an active role, thus increasing their motivation and interest: they are not just listeners but they operate to construct their knowledge. For example, a teacher wrote “We all enjoyed! Teachers and students.” And a student wrote “We did not need to suffer in learning mathematics”: at the end (luckily!) the equation mathematics = suffering has been broken, at least in the class of this student!

Another issue pointed out by the teachers in their analysis is that the level of the activities can be very high. Some activities which were used while experimenting with the kits were in fact difficult; the teachers were not afraid of this, but said: “We were aware of it: we didn’t want students to believe that mathematics serves only to solve simple calculations.” And a primary school teacher reported one of her pupil’s words: “It’s not easy, you must think a lot, but it’s for this reason it’s so beautiful.”

The different climate generated by lab activities with respect to the traditional lesson seems to have another not irrelevant by-product, which has been pointed out by all the teachers, that is the possibility of integration for students with special needs. In fact, the proposed activities can always be dealt with at different levels, which makes it possible - partially at least - to overcome some of the usual difficulties in learning mathematics: in the collective search for a common solution, a positive dynamic is generated, so that the experiments done by some become a benefit for all the others.

Another relevant point emerging from the answers by teachers is related to language: many of them outlined in fact that a great part of the difficulties in mathematics are often linked to problems in understanding the texts. Students may be helped to overcome this difficulty with activities where they first have to discuss, in a small group of school mates, the meaning of a complex text, where they have to understand first of all what they should do. In fact “...Laboratorial activities lead naturally to focusing attention on difficulties of substance, and of sense, and render it spontaneous not to be distracted by the difficulties of form” (Dedò and Di Sieno 2013, 333).

Another benefit emerging from teachers’ reports was that students had the opportunity to discuss their ideas with peers - which does not usually happens in traditional teaching - and this involves a step forward: understanding a given concept is not at all the same thing as being able to communicate it to peers, which involves a different and deeper level of comprehension. It is also important to underline the kind of discussion between students, as a teacher says: “The discussions were calm because correct answers were supported by the evidence of the given material.”.

And this kind of discussion is also the best way to appreciate the positive role of errors at its best (see e.g. Dedò and Sferch 2012). In the context of this experiment, where evaluation was not of individual students, students were not frightened of making errors and teachers could use their mistakes in order to learn many things about their way of thinking: “Students learn not to be afraid neither of making mistakes nor of mathematics” (a secondary school teacher) and, from a student: “I was not frightened of making mistakes”.

### Conclusions and implications for teacher education

On the whole, we can say that the project was a success, and it was useful for students and especially for teachers (to whom in primis it was directed). The teachers did not seem to have had difficulties in the management of the laboratories, and appreciated the opportunities stressed by this method both with respect to the mathematical content and to their relation with students, using the possibility of observing student’s work from another point of view.

On the other hand, we have to register the fact that there has been a strong need to support teachers - especially in the last phase of the work, regarding evaluation - in order to focus on what is relevant and what is not relevant in their work with the students. The evidence is that, according to the Eurydice Report, 2012, in order to achieve sustainable improvements in mathematics teaching, it is not enough to provide teachers with suitable material and organize suitable learning environments, but it is also necessary to support groups of teachers working together on designing, experiencing and testing learning objectives and competences.

An obvious consequence of this remark is that there is no hope of an immediate spread of good teaching habits through these activities: if we aim at achieving some long-lasting results, this will need implementation over a medium or long-term period. In fact, it is not chance that the project we quoted in the introduction, which constitutes the general framework of our activity in the promulgation of good teaching methodologies in schools, declared that it foresaw the need for at least ten years of activity.

### References

Arzarello, F., P. Drijvers, and M. Thomas, 2012. *How representation and communication infrastructures can enhance mathematics teacher training*. Paper presented at 12<sup>th</sup> International Congress on Mathematical Education COEX, Seoul, Korea.

Ball, D., and H. Hill. 2004. “Learning mathematics for teaching: results from California’s mathematics professional development institutes”. *Journal for Research in Mathematics Education* 35 (5): 330–351. doi: 10.2307/30034819.

Cazzola M. 2009. “Problem-based Learning and teacher training in mathematics: the role of the problem.” In *Proceedings of the 33rd Conference of the International Group for the Psychology of Mathematics Education*, edited by M. Tzekaki, M. Kaldrimidou, and H. Sakonidis, 441-441.

Thessaloniki, Greece: PME.

Cazzola, M. 2008. “Problem-based Learning and mathematics: possible synergical actions.” In *Proceedings of ICERI 2008 Conference, (Madrid, November 2008)*, edited by L. Gómez-Chova, D. Martí Belengué, and I. Candel Torres, 603-612. Valencia: IATED.

De Tommaso, D., and S. Di Sieno, 2014. *Playing with mathematics can be a successful way to teach it*. Forthcoming.

Dedò, M. 2001. “Più matematica per chi insegna matematica.” *Bollettino dell’Unione Matematica Italiana*, Serie 8, 4 (2): 247–275.

Dedò, M. and S. Di Sieno. 2013. “The mathematics laboratory: an outline of contents and methodologies.” *La Matematica nella Società e nella cultura, Rivista della Unione Matematica Italiana* (I): 321-342.

Dedò, M., and L. Sferch, L. 2012. “Right or wrong? That is the question”. *Notices of the American Mathematical Society* 59 (7): 924-932.

EACEA/ Eurydice, 2011. *Mathematics education in Europe: common challenges and national policies*. [http://eacea.ec.europa.eu/education/eurydice/documents/thematic\\_reports/132en.pdf](http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/132en.pdf)

European Commission/EACEA/Eurydice, 2012. *Developing key competences at school in Europe: challenges and opportunities for policy*. Eurydice report. Luxembourg: Publications Office of the European Union.

Grouws, D., and J. Hiebert, 2009. “Which teaching methods are most effective for maths?” *Better: Evidence-based Education* 2 (1): 10-11. <http://www.betterevidence.org/uk-edition/issue-2/which-teaching-methods-are-most-effective-for-maths/>

[Back to contents](#)

## **Form tutors in the joint teaching of Music and collaborative work: perspectives and experiences**

*Fernanda Martins & Teresa Sarmento*

*University of Minho, Portugal*

fmartins@ie.uminho.pt & tsarmento@ie.uminho.pt

### **Abstract**

In the Portuguese school system, form tutors (FT) are selected among regular teachers assigned to the class. The joint teaching of music is a part of the educational system in basic education. There is also the position of FT in specialized schools, which also includes a three fold function (relationship with the student's family and relationship with other class teachers), very similarly as with the FTs in the previously mentioned teaching modality. In this field of the relationship among schools, it seems to us that the conceptualization of the FT as core figure in the coordination and promotion of the collaborative work of the teachers of the class is essential. This communication is based on the analysis of the empirical data obtained from the testimonies of FTs (from schools specializing in teaching music who work in a joint teaching system), regarding their representations and experiences in leadership and coordination of teachers among schools, in which there is a joint teaching system.

**Keywords:** form tutors; leadership; joint teaching system for music; collaborative work.

### **Context of the research**

In Portugal, one of the ways to learn music is the joint teaching system for music. This is a part of the educational system in basic education. It is optional and provides musical and instrumental training to students who are interested in taking it. In order to achieve this, there is a system, subject to protocols between general education schools and schools specializing in the teaching of music. Although general education schools try to merge all joint teaching system students into appropriate classes, the same class can have students from that regime and students who do not attend a joint teaching system.

Thus, the joint teaching system demands that schools specializing in the teaching of music (SSTM) (private or public academies, schools, and conservatoires) and general education schools work together. The representative from the SSTM, hereinafter referred to as FT2, is a central figure in this joint work, in both schools of general and of music teaching. We have chosen to designate this person as FT2, because students who attend this system also interact with a FT from the general education school, whom we shall designate as FT1.

In the Portuguese school system, form tutors work as an intermediate education management structure, with leadership tasks among students, parents/SS included in key stages 1, 2, 3 and 4, developed by a teacher selected among regular teachers assigned to the class. The FT is responsible for a position of coordination and orientation with a threefold function: the guidance of students' career; the relationship with the students' parents/SS; and the coordination of the educational activities of other teachers. Although legislation specifies that this position should only be given to suitable teachers, taking the leadership tasks they will have to perform into consideration, in practice, it is given haphazardly to any teacher, regardless of his/her time of service, of his/her experience in leading groups, of whether he/she has enrolled in specialized training or not and of other variables.

In the case of joint teaching system classes, a representative of music teachers (FT2), becomes a participant in the class council at the regular education school and, therefore, is under the direction of the regular education FT1. Thus, in these cases, in addition to several other prerogatives performed (cf. Lima, 2011) by this body alone, there is also a fourth task, as both FTs must guarantee the connection between the music school and the regular education school, which makes their action more complex. This fourth joint area aims at putting in practice that which is



already stated in Decree Order Number 691/2009, of June 25th, and becomes even clearer in Decree Order Number 225/2012 of July 30th, for this type of teaching: “Both teaching establishments, that offer study plans of courses attended in a joint teaching regime must implement the necessary mechanisms for purposes of pedagogical coordination and evaluation” (article 10, line 2).

### **Research aim**

In this paper, we want to approach, in an exploratory way, the tasks of a FT in the specializing teaching of music, regarding the articulation between the school specializing in the teaching of music and the regular education school. Thus the starting point of this study, that underlies this paper, is the following: How is the Class Director of the music specializing school is going to establish an articulated relationship with the Class Director of the regular teaching, with a view to achieving an integrated educational process of the children who are attending the articulated teaching? Specifically, we aim at getting acquainted with the representations of Class Directors of the specialized music teaching on the objectives of the articulations with the CD of regular teaching, as well as the difficulties and opportunities arising from that articulation. Besides, we should like to unveil the existence of different professional cultures in their relation with the objectives and areas of teaching where one Works. We are expecting to see two sides or playing fields of leadership: the FT2 (FT of the SSTM), along with teachers of the same school, and the articulation between the two FTs (FT2 SSTM; Ft1 = regular education). It ought to be mentioned, beforehand, that both share a common focus: educating children; but, each one does it with purposes, cultures, guardianships and identities which may be very different from each other.

### **Research methodology**

#### ***Methodological note on the interface between teaching and research***

The empirical work for the analysis of FTs representations regarding their educational relation/coordination of FTs and SSTM teachers was based on interviews carried out by students taking their Master’s degree to FTs who were contacted by them. The interviews were based on a script created by students and teachers on the subject of educational coordination and form tutors, included in the program of the Master’s degree in teaching, which also includes the teaching of music. This was a training process for promoting a shared research.

Thus, its preparation occurred in different stages: first of all, as this work was carried out by Master’s degree students who should be introduced to research processes, a methodological approach concerning the research as a data collection strategy, focusing on its theoretical and technical principals, was developed; then, in groups, students chose one of the sides of the action of a FT - educational orientation of students; pedagogical orientation of teachers, relationship with the parent/SS - and developed a set of questions; this set of questions was later approved by the class. Then, the team of teachers gathered the results from the different classes, chose and systematized the questions, and suggested a pilot survey, which was then analysed again by each class in order to be validated.

In the case of the Master’s degree class for music teaching, the final script also included specific questions which addressed the independent action of the FT2 relatively to the specializing teaching in music. The final script resulted from the feedback received, and each group used it in the interview conducted with the identified FT2.

Regarding the training of Master’s degree students, the direct contact with a teacher who was also a form tutor, in addition to a reflection on theoretical issues related to intermediate pedagogical management and the research element, provided an approach to the reality of everyday life within a school environment, which contributed to a better articulation between theoretical and practical knowledge of the teachers involved. Afterwards, the interviews were entirely transcribed and discussed in group by each class, according to a set of relevant studies and texts which were

selected and suggested by the team of teachers, and were related to the themes and issues discussed.

The following step in the research, which had already been fully developed by the teachers-authors, was the processing of the corpus of information collected, with a total of 27 interviews. In this paper, we shall only use the information processed from five interviews (interviews which were carried out with FTs2 -numbered from 1 to 7-, but, for this specific address, we shall only use the contents of five: E1, E3, E4, E5 and E6, which correspond to the interviews carried out with FTs2 from the special teaching of music). The data was processed according to the content analysis technique, following the steps suggested by Maroy (1997); that is to say, after fully transcribing question sheets and skimming the text. From this process, an analysis grid was created, which included categories from the sheets created by us. Then, their content and final social interpretation was assessed.

Our goal in explaining the way in which knowledge was provided to our students is to account for the ethical principles we support in our role as teachers/researchers, since we see ourselves as leaders dedicated to shared leadership processes.

### ***Legal framework of a FT within the specializing teaching of music in joint teaching***

The joint teaching of music is a part of the educational system in basic education. It is optional and provides musical and instrumental training to students who are interested in taking it. In order to achieve this, there is a system, subject to protocols, between general education schools and schools specializing in teaching music. This teaching system was created by Decree Order number 691/2009, of June 25<sup>th</sup> as a consequence of the general principles defined by the Basic Law for the Educational System, namely aspects which concern goals. It also pursues what is defined in Decree-Law number 344/90, of November 2nd. The principle of a flexible management of the curriculum is the basis for this system, and it increases the autonomy of schools, according to which, they can choose Basic Dance, Music or Gregorian Chant as part of their programmes. The study plan for students who attend these courses consists of a set of subjects which integrate common subject areas in basic education, replacing the subjects of Musical Education and Visual and Technological Education in the regular regime by subjects in the artistic area. The Basic Music Course includes Musical Training, Collective Classes and Instruments.

It is mandatory that art subjects be taught by teachers from a school specializing in teaching music. Students may attend them, in accordance with proximity issues or organizational decisions, at either one or the two schools. This means that students who attend regular education at an EB2/3 school (a school for Key Stages 2 and 3) may have to go to a school specializing in music, in order to attend one or all three subjects of the artistic subject.

Although regular education schools try to group students of a joint teaching system into specific classes, in order to make the organization of schedules easier, it is possible that one class may have students from that regime and students who do not attend a joint teaching system. Teachers who teach music subjects, or their representative, designated by a pedagogical council at their school, should participate in class councils at the general education school, for articulation and evaluation purposes (point 3. Article 8, Decree Order number 691/2009). Although the Decree Order previously mentioned does not include this condition, the representative teacher is usually designated by the school specializing in teaching music as FT. This position usually coincides with that of Music Training or Collective Class teacher, as these are the ones who work with the entire group of students.

At private or charter schools, where music is taught, the existence of a Form Tutor depends on the rules of procedure, but it is always mandatory to choose a representative teacher in cases where there is a joint teaching system, in order to represent the articulation with the regular education school. Thus, in addition to career guidance tasks with students, coordination among teachers and mediation with parents/SS, the person holding this position has another task: that of representing music teachers at the class council held at the general education school and, therefore, he/she is under the direction of the general education FT. As we have mentioned above, this paper focuses and questions coordination among teachers at specialized schools and their articulation

with (non)existent leadership and collaborative work practices (Roldão 2007) between player groups in both schools involved.

Before we continue with the presentation and discussion of data, it is important to clarify that we see the FT as a central figure in the coordination and promotion of collaborative work between the teachers of a class, and we do not limit his/her action to an administrative-bureaucratic role. The reduction of a FT's field of action to a bureaucratic management position, within the current conditions, becomes increasingly insufficient; therefore, the work carried out, in this position, should be that of an educational leadership, which means the “creation of conditions and contexts where teachers may learn new practices, such as professional community” and, also, “to support the growth of a team, and networking, in order to face challenges and improve students' results” (Bolívar 2012, 62, 78, 79).

Thus, among the various underlying goals that are inherent to the role of the educational leadership played by the FT, we highlight the collaborative work which has already been mentioned previously. At this stage, it is important to mention that this is:

“an articulated working process, thought of as a group, which allows a better achievement of planned results, based on the enrichment brought by the dynamic interaction between varying specific knowledge and varying cognitive processes collaborating among themselves. It implies a strategic planning of the goal which guides (teaching) tasks and a suitable organization of all devices within the group which allow (1) to achieve what is sought more successfully (sought learning objectives), (2) to activate different potentials of all participants (in the context of group-subject, group-class or others) as best as possible, in order to involve them and guarantee that productive activity is not restricted to only a few, and (3) to increase the knowledge built for each by introducing new elements that come from the interaction with all others” (Roldão, 29).

Despite all potential virtues of educational leadership and collaborative work, it is necessary to recognize that both have their tensions and dilemmas (Hargreaves 1998; Bolívar 2012; Roldão 2007), particularly, as in the case studied, when there is a set of students (class), that studies according to the orientations of two groups of teachers (SSTM teachers and GES teachers) and are, therefore, subjected to two FTs (FT1 - from the SSTM and FT2 from the GES). Furthermore, this scenario also includes teachers and FTs who belong to different schools, with different cultures, each of them with particular interaction standards among teachers. Therefore, we assume that the FTs and the teachers groups, involved in the joint teaching system, do not work in an isolated manner, but that they also do not work with most teachers of the class (as a whole). On the other hand, they work in smaller subgroups, such as the general education subgroup and the music teaching subgroup. Thus, we are faced with a situation similar to that which Hargreaves (1998, 240) designates as balkanized cultures. These are some of the aspects we explore in the analysed context.

## Findings

From what has been stated in the last section, it appears that collaborative work between teachers depends on the kind of culture they share. Thus, in this discussion, in order to achieve a better understanding of the development (or not) of collaborative work between FTs, it is adamant to point out some essential issues concerning teachers' cultures.

Within this scope, it is important, first of all, to make it clear that, although we recognize that there exists a sharing between of generic characteristics, we are paying special attention to differentiating elements underlying them.

In the first case, one finds the political-ideological cleavages among teachers, the differences in statute among teachers of different departments and teaching levels, the different social background, among others (Lima 2002). As to the issue of teachers' cultures, it “consists on the characteristic relationships patterns and on association forms among the members of these cultures. It can be observed in the way the relationships between teachers and their colleagues are articulated” (Hargreaves 1998, 186). These forms of association can assume varied shapes, each with different implications in the work of teachers and in the educational change. According to Hargreaves (1998), there can be four general forms of cultures, namely: individualism,

collaboration, artificial fellowship and balkanization.

In this paper, we come to the conclusion, following Lima (2002) that the culture of teachers differ both among schools and teachers, within each school. Given that we privilege, as subject of our study, the interaction among actors of different schools around a common educational process (the articulated music teaching), to which they have not been at all prepared and stimulated, by the board of the schools, and since teachers show no initiatives to foster it, we admit the existence of an artificial fellowship and the development of balkanized cultures. In the sequence of our work, we present and discuss the testimonies of the FT2, relatively to the kind of work carried out among schools.

Without a second thought, FTs2 consider that, within a collaborative work context, among all teachers of students who attend a joint teaching system, “the greatest difficulty is the interaction with the regular education teachers” (I4). When, eventually, there is some type of cooperation between these two organizations and their agents, it usually is the result of the efforts of the music teaching school and of its FT, when the general education school is interested in promoting, for instance, a Christmas party, to which music students can significantly contribute. Thus, there are FTs2 who are advised “Early on, at the beginning of the school year, by the Director of Studies, to keep permanent contact with the general education FT” (I1); others start this process on their own initiative: “I was the one who took the first steps on the academy/regular school aspect and so I can talk about it because I was the first to go to the school” (I3).

These FTs2 feel that they are also the ones who try to join the two groups of agents. Two FTs2 have expressed their opinion regarding this issue as follows: “In my case, I am aware that I am the one who joins the two sides the most” (I1), and “there is little cooperation between the academy and the school group and I was the one who suggested all activities” (I4). In some cases, they even invite the FT1 for evaluation meetings at music schools, although this initiative has met with little response, as one FT2 explains: “actually, he/she has never been present at a meeting and so we write down the guidelines and send them to the regular education school. Usually, I am also not present at the evaluation meeting in the regular education school” (I4), that is to say that bureaucratic resources are nearly the only instruments that guarantee a connection between teachers from one or the other school. Despite of mentioned attempts, there are also discourses which indicate that “there is still a lot of work to do” (IE), because FTs1 and teachers from regular education schools are still “a little reluctant” (I3) to receive FTs2.

In other situations, it is even possible to see the total lack of collaborative work in each teacher group, whether they are from the SSTM, or from the regular education school, for several and variable reasons. Some are related to “administrative or other constraints which create difficulties or significantly discourage the possibility of different procedures” (Hargreaves, 1998:193). We believe that this type of constraints take place among the organizations that manage both curriculum components, as “the fact that I am not there, at the school, makes things a little more difficult (...) I have already tried to speak to the Geography teacher and the Visual and Technological Education teacher and things are not that (...)” (I2). The fact that some curriculum areas which used to give room and the possibility to develop collaborative works between FTs1 and FTs2, as well as their respective teachers, have disappeared, can also be seen as a political-administrative constraint, as I3 explains:

“because the *área de projecto* (class project) was the subject which used to unite the two schools the most, as there were joint projects between the two schools. There is an educational project at the school and, in class project, we used to develop common projects between the two schools, which united teachers, students, parents... it was great. This year, they took that away from us and we felt very sorry for it”.

Furthermore, FTs1 and regular education school teachers are not fully aware of the importance of specialized teaching in music, as we have gathered from the discourse of this FT2: “because, sometimes, regular education school teachers are not fully aware of the issue of specialized artistic teaching in music and, sometimes, they are not fully informed of what is going on and, sometimes, it is the FT at the academy who must explain, who must inform, who must be solidary and also motivate the FT at the general school” (I1).

According to some accounts, in other situations the issue is not only the lack of awareness, but also the lack of knowledge of the joint teaching system itself, and of the formal possibilities for collaboration it implies. There are even situations where the general school tries to exclude those representatives from decision making areas, thus ignoring any possibility of recognition of any type of leadership. From our perspective, this situation takes the shape of a non-participation scenario on the part of the regular education school teachers (Lima 1992) towards the FT2, as a representative of the school specializing in music, at the Class Council. The following account denounces this situation:

“general education teachers didn’t even know exactly what joint teaching was and I had problems, or rather, many problems, early on at the general education school. I can even tell you about a very funny episode: on the first evaluation meeting at the school group, they didn’t want to let me in, nor to be a part of the meeting, and it was necessary to call the headmaster who brought the rules of procedure and had to tell the teachers that I was a part of the meeting and of the class council” (I4)

The situation described in this testimony reveals traits of an artificial fellowship insofar as teachers’ presence in this organ has not evolved spontaneously from the initiative of teachers’ of both schools, especially as the school of regular teaching is concerned, being, on the contrary, an administrative and hierarchic imposition. On the other side, from this it is possible to see that there is an acute lack of new educational opportunities which, early on, makes any leadership opportunity impossible, especially when it must be based previously on collaborative work between the regular education school and the music school. It is no longer about administrative and organizational constraints, but rather a different type of constraint of a political nature, namely concerning the social representations of an unequal status between the curriculum area of music and other academic subjects. FTs2 say that there are regular education teachers who “psychologically pressure their students throughout the school year, saying that music is just an hobby and even motivate them to quit it” (I4) and that “...schools still largely don’t accept music” (I4). The discourse of I2 also follows this philosophy, identifying a hierarchy between the subjects that make up the curriculum in joint teaching, which can be seen as a hierarchy between teachers; according to her, there is “a distinction between subjects which are deemed to be first or second class. This is also related to the students’ workload, which then makes time too scarce to handle anything ...”. This social representation, regarding second class subjects, is followed by a social representation, regarding the existence of ‘second class teachers’, reasons which may help understanding why leadership processes are immediately blocked. How can a teacher who does not recognize another as his/her equal in professional terms, feel that he/she be led by him/her or respect the leadership that others rightfully try to develop?

We believe this situation of valuing only curriculum subjects is related with “the political-ideological environment and, in particular, the pressure to present justifications [which] strongly condition schools to essentially attend to the quantification of their results in very specific and previously defined areas”. (Lima 2008, 366).

But, in any case, this status of minority, given by general education teachers to the area of music must be qualified as unfavourable to the collaborative work between agents in both schools.

### **Conclusions and implications for teacher education**

Going back to the dilemmas and tensions this new situation of the joint teaching of music may create, and using only the narratives provided by the teachers experienced in Form Tutoring in SSTM, it is easy to see that different levels stand out, especially when considering two basic concepts used by us and that, we believe, interfere in the action of form tutors: collaboration between teachers and leadership. Focusing on the FT2, as the pivot in such activities, we are able to verify that he/she receives a leadership status from the SSTM directorate in order to conduct the coordination between teachers in those schools and to cooperate with the FT1 at the GES: as to internal co-workers, coordination is viable, due to the local proximity, the professional identity and the reference of an organizational culture shared by them; in other words, it is possible, because teachers share particular interaction standards; therefore, the intermediate leadership granted to

them, in common conditions, has every condition to be carried out. As to the relationship with colleagues of CC of the GES, the situation is diverse: they live in different professional spaces, do not share the same cultural and professional identity, and live in spaces when they go there to attend CC meetings, which are statutorily unknown to most GES members; therefore, when leadership is mentioned, it is a circumvention; at best, there may be cooperation agreements between the FTs, and not work developed by most class council teachers (as a whole). In this context, coordination between the FT2 regarding FT1 does not exist, and any collaborative work between teachers from one school or the other may be truly constrained. The situation described takes on the characteristics of balkanized cultures, as it is more the type of collaboration that divides two teacher groups and FTs (cf. Hargreaves 1998), because, if there really is collaboration, it only happens within each group.

Thus, recognizing the complexity of the academic life of students in a joint teaching system, the existing dissonance between each of their FTs may have a serious impact in the entire learning process. There is still another challenge that has not been exposed in any discourse, which is that of the coordination role between FTs1 and SSTM teachers. Besides, it is not the role of the directorate in any of the schools to indicate the FTs who will be in contact with the other.

When confronting this information with Bolívar, who advocates the existence of an educational leadership able to “create conditions and contexts so that teachers may learn new practices as a professional community”, in other words, “to promote steps that stimulate interaction and joint work”, we have verified, according to the analysis carried out, that there is still a long way to make, in order to really implement shared leadership between FTs2 and FTs1, and to “support the growth of a team and the joint work capacity to face challenges and increase students results” (Bolívar 2012, 62, 78, 79).

Upon reflexion on the relevance of this study to the training of teachers, we consider that it reveals several dimensions, both to the master’s students who have collaborated with us in the realization and analysis of the interviews, and to the teachers who are already working. Relatively to the former, their participation in research processes makes possible for them to understand their role as researchers-teachers, whose action is not limited to an intervention based on knowledge produced by others, but, on the contrary, have a perception of themselves as co-producers of professional knowledge. The fact that they are collaborating in this study in a stage of their initial training process, the contact with teachers who are already in their teaching career, with the schools where these work, allows them to become familiar with the space of professional action, which shall foster a progressive appropriation of a teacher’s practice. Besides, the knowledge produced and appropriated by the students regarding the constraints around the collaborative work among DTs of different schools is an important contribution to a serious critical reflexion about that reality and, within that scope, to create alternatives to realize a collaborative works that is really effective.

The interviewed teachers also can benefit of some apprenticeship in this process, because of the simple fact that they are compelled to reflect and think over that which they already take for granted. The confront between the external elements (the interviewers) and the internal ones (the interviewed DTs) creates a reflexive entropy that leads to a repositioning of perspectives and attitudes. Thus, and from the reports we collected about the way interviews occurred, in the teachers’ narratives arise questions such as: What’s the meaning of the articulation among teachers of distinct fields and different schools? What are the educational results of that (dis)articulation to the students of the articulated music teaching? What’s the real meaning of the articulated music teaching? The questioning a teacher conducts with him/herself helps him/her to rethink the social and educational roles they develop in their practice.

Finally, it is important to mention that we consider that the analysis carried out is seen by us as exploratory and, above all, partial, because, in the future, it should be confronted with the representations and experiences of FTs from the SSTM, who have specifically participated in the joint teaching of music.

## Acknowledgements

This work is funded by National Funds through FCT - Foundation for Science and Technology - under the Pest-OE/CED/UI1661/2014 design CIEd (Portugal) and under the CIEC.

## References

- Antunes, F., C. Gomes, F. Martins, and T. Sarmento. 2012. “Construir a relação pedagógica em tempos de incerteza: perspectivas e experiências de direção de turma.” In *Atas do III congresso ibero-americano de política e administração da educação, gestão pedagógica e política educacional: desafios para a melhoria da formação e profissionalização dos educadores*, 203-214. Zaragoza: Forum europeu de administradores de la educación del estado español, associação nacional de política e administração da educação e forum português de administração educacional.
- Bolívar, A. 2012. *Melhorar os processos e os resultados educativos*. Vila Nova de Gaia: Fundação Manuel Leão.
- Hargreaves, A. 1998. *Os professores em tempos de mudança*. Lisbon: Mc Graw Hill.
- Lima, J. 2002. *As culturas colaborativas nas escolas: estruturas, processos e conteúdos*. OPorto: Porto Editora.
- Lima, J. 2008. *Em busca da boa escola: instituições eficazes e sucesso educativo*. Vila Nova de Gaia: Fundação Manuel Leão
- Lima, L. 2011. *Administração escolar: estudos*. OPorto: Porto Editora.
- Lima, L. 1992. *A escola como organização e a participação na organização escolar*. Braga: IEP, University of Minho.
- Maroy, C. 1997. “A análise qualitativa de entrevistas.” In *Práticas e métodos de investigação em ciências sociais* Albarello edited by F. Digneffe, J.-P. Hiernaux, C. Maroy, D. Ruquoy, and P. Saint-Georges, 117-155. Lisbon: Gradiva.
- Roldão, M. 2007. “Questões e razões. Colaborar é preciso: questões de qualidade e eficácia no trabalho dos professores.” *Noesis* 71: 24-29.

[Back to contents](#)

## Free 2be You and Me in education

*Alba Alonso Feijoo*

*Universidad de Vigo, Spain*

albaalonso@edu.xunta.es

### Abstract

The Free To Be You and Me project focused on teaching children how they could like anything no matter their biological sex so as to comfort their unique identity, ideas which were beautifully conveyed through the use of music, poetry, literature and sketches. After 40 years the Free-to-be-You-and-Me-ethics have become even harder to teach and transmit as society seems to be heading back to a pre-feminist era in which there was no freedom left for children to be themselves. This present state of affairs should be overcome by means of both the hidden curriculum on the one hand and open activities in which children's literature and music should work as mayor tools on the other. Hence, I will briefly describe the contents of the aforementioned project in an attempt to make use of its pedagogy to approach our educative practice.

**Keywords:** gender; stereotypes; children; education.

### Introduction to the topic

The origins of this account date back to 1972 when a woman called Marlo Thomas, who had just concluded filming the popular sitcom “That Girl”, took a trip all the way from New York to Los Angeles to visit her beloved three-year-old niece. One of the things Marlo loved the most in the world was reading to her niece and thus decided to present her a book as a gift. Nonetheless, what she astonishingly realized in her pursuit was that all the books she could find consisted practically of the same type of stories she had been offered as a child. Stories in which boys were supposed to invent things and girls were supposed to use the things boys invented as we could read in Darros’ book *I’m glad I’m a boy. I’m glad I’m a girl* (1970) - see illustration 1.



Illustration 1

Unfortunately, this still seemed to be the motto for younger generations at that time. As Marlo did not wish her niece to have to endure the same thirty years she had been herself in need of to be able to overcome those types of readings, decided to do something about it. After much thinking and some day-dreaming she contacted her friend Gloria Steinem, who was a feminist activist. Steinem, together with a group of other visionary women later to be called the “founding mothers” as complementary to the “founding fathers of the nation”, was on the verge of initiating a project called the Ms. Foundation for Women which pretended to collect founding so as to help



women suffering from difficult conditions (poverty, mistreat, racism, etc). Marlo Thomas’ original idea was not only fantastically welcomed by this group but she was also invited to take part in the organization so as to give shape to her idea and present it integrated in the foundation. Gloria Steinem was responsible for introducing Marlo Thomas to Letty Cottin Pogrebin, who at the time was devoted to writing articles related to the gender stereotypes topic. Thomas and Cottin rapidly realized they shared the same vision as regards the world and thus became a team with one unique aim; to challenge all those outdated ideas as regards gender continuously being transmitted by children’s literature. They soon got down to work by contacting with various editors but nothing of what they were offered seemed to satisfy their needs. According to Thomas, those books were too babyish and she was convinced that children of the 1970’s had nothing to do with those from her generation as a child. In fact, she wanted to conceive something different much closer to her present time, full of rock concerts, T.V. programs, etc. Thomas and Pogrebin understood it had to be something else, a new project in which they wanted to combine humour, acting and singing. Thus, Thomas resolved to invite humorists, singers, actresses and actors to take part in her initiative, which came to be known as *Free To Be You and Me*. In fact, Marlo Thomas used all her contacts to be able to join in just one album the voices of Michael Jackson, Roberta Flack, Rosey Grier, Alan Alda, Mel Brooks and Harry Bellafonte among many others. These renowned artists’ contributions together with an astounding work on gender neutral education made a successful album later to be followed by a book and a one-hour-T.V.-special (“Free to Be You and Me”).

### **The aim of arguments**

The album which firstly named this project and which came to light in November 1972 was composed of nineteen tunes sung by different artists. Throughout this article I will present some of these pieces together with a brief introduction on how we could bring those 1970’s *Free To Be You And Me* didactics into our twenty-first century classrooms.

### **Theoretical framework**

#### ***How projects such as Free To Be You And Me may help us improve gender equality in our classrooms***

Children’s literature has been proved as one of the main tools children use to feed their gender learning process whether it is in a negative or a positive way. If children are not awarded with new, more contemporary male and female models in the books they read, it will be beyond any doubt rather troublesome for them to link certain roles, attitudes or behaviors to their gender. As far as boys are concerned, Johnston and Mangat (2002) argue that “Issues of masculinity are rarely foregrounded in literary study and students are given few opportunities to interrogate conventional assumptions about male gender constructions” (“Making the Invisible Visible” 133). The invisibility of the genders both in studies and in literature makes it impossible for children to see any farther from the binary, and it is not only the girls who must be awarded visibility but the boys as well, who always seem to be trapped in an obsolete hegemonic masculinity, to use R. W. Connell’s terms. Just as traditional children’s literature may be accused of a dangerous zone as regards gender stereotyping (unless accompanied with the proper adult guidance), non-gender-stereotyped works might be characterized as functioning the other way around in becoming efficient weapons to combat those issues. As a matter of fact, *Free To Be You And Me*’s first aim was to use children’s literature in a search to stop spreading outdated notions of gender not applicable to children anymore. Notwithstanding, the makers of such a plan wanted to take a step ahead because just as Wannamaker (2008) stated that “there is no monolithic “Boy” (17), there is no monolithic girl either, and each child will have a different reading experience which will not only be moulded by books. Catherine Butler (2006) recognizes children’s literature as a part of a poly-system when she cites Shavit saying that “the literary polysystem contains ... both canonical and non-canonical books, but also a variety of media” (as quoted in *Teaching Children’s Fiction*,

86). This diversity of media is also referred by Anne Hass Dyson through the concept “permeable curriculum” which makes reference to a set of knowledge in which we do not only include the kind of fiction that is part of the literary canon but all those varied types of popular culture in which children are really buried (as quoted in Newkirk 2002, 172). This culture is composed of a wide range of material apart from books including T.V., jokes, video games, etc. Accordingly, *Free To Be You And Me* became the perfect way to reach children of the newer generations who were not only surrounded by children’s literature but by a much wider realm of popular culture ready to influence on their minds.

### ***Free To Be You And Me***

The first song to appear in the album corresponds to its hymn. Let us have a look at part of its lyrics:

“There’s a land that I see where the children are free  
And I say it ain’t far to this land from where we are  
Take my hand, come with me, where the children are free  
Come with me, take my hand, and we’ll live

In a land where the river runs free  
In a land through the green country  
In a land to a shining sea  
And you and me are free to be you and me  
(...)

Every boy in this land grows to be his own man  
In this land, every girl grows to be her own woman  
Take my hand, come with me where the children are free  
Come with me, take my hand, and we’ll run.”

This song’s lyrics core issue is an offer of freedom. It is surprising how confined we may feel though living in a supposedly free world. Children are born without prejudices, not knowing the differences between black or white, blue or pink. Notwithstanding, as soon as the age of four they already seem to belong to some kind of binary world, which tends to be more and more exaggerated as they grow. As Taylor (2003, 310) affirms “by age seven and perhaps as early as age four, children begin to understand gender as a basic component of self”. With this song Marlo Thomas claims for a new land in which kids will not have to choose between colours, genders or races. A land in which they are free to be themselves and to show their unique individualities. Any child would surely love to visit this place holding Marlo Thomas’ hand because it is presented as a fun universe out of constraints, outdated norms and straight jackets which proposes unique ways for being boys or girls. Our education system should work as the embodiment of this land where pupils could feel free to enjoy life as individuals far from society’s useless restraints and prejudices. Unfortunately, this land seems to remain an utopia in the real world as we must not fail to recognize that we always do gender in gendered institutions full of gendered people. There are not gendered-virgin beings with whom we may interact and as a consequence there are not really any other options about “whether to participate in the binary gender system” as “society’s fierce gender pressures make the question of agency - even the tiniest actions - highly complex” (Rabinowitz 2004, 21). All of us have been somehow gender-contaminated since our birth, or what is worse, before our birth day. Journalist Annie Murphy Paul (2010), author of *Origins*, studies what we may learn before we are even born. We used to think that learning began at the moment of delivery but according to her it actually goes back nine months. We all may confirm how as soon as parents know the sex of the future baby behave in a different way depending on the sex, thus sending disparate signals to the baby. Hence, before being able to change our land we should change its inhabitants’ way of thinking so as to allow the flow of freedom of thought and choice.

### ***Boy Meets Girl***

Following this tune *Boy Meets Girl* is introduced, a sketch conducted by Marlo Thomas and actor Mel Brooks in which two babies who have just been born want to solve their doubts as

regards their sex and “corresponding” gender. The baby who thinks is a girl uses as many stereotypes as possible to define and reassure “herself” about her gender: cute, patient, secret-keeper, etc. and in order to convince the other baby that he is a boy she points out how he must surely be since he is impatient, does not like keeping secrets, has no hair, etc. This supposedly baby girl also mentions how she would like to be a waitress when she grows up and since the other baby would like to be a firefighter, there again her reaffirmation that she is true about their sexes once more. Suddenly a nurse appears to change their diapers, moment when they are able to see their genitals to realize they were actually wrong. At this moment the climax of the story takes place highlighted by Marlo Thomas’ voice, which says: “you can’t judge a book by its cover”. This line is one of the main slogans this whole project is about. Thomas’ ambition was teaching kids and adults how their biological features could not define what they liked, did or how they felt. This song may definitely help us point out to our pupils how sex, i.e., our inborn features, are not directly connected with gender, i.e., our nurtured features, which would help us introduce the sex/gender difference concept, rather confused and swapped by children and society in general. If it is the case of older pupils being involved in our teaching we may even go beyond and account for the fluidity of the gender notion, through Judith Butler’s (1999) work who in her book *Gender Trouble* first alluded to gender as performative. We may also work with our pupils as regards all the stereotypes they have already taken in and which seem to emerge as natural for them. Pupils, grouped in pairs or small teams, could make lists in which all those stereotypes would flourish, to be later presented to the class group. Afterwards, the teacher should provide them with enough real examples to demolish whatever absurd ideas had been shared as truths. On top of that, these realities designated to battle already internalized stereotypes should be displayed in different formats: a youtube video, a children’s literature book, a commercial, some news, etc so as to reach young twenty-first century minds. Children tend to discard as odd whatever they have never seen or heard of, hence, let us provide them with enough examples to amplify their universe as regards gender. Let us give them lots of “books with different covers”.

### ***When We Grow Up***

The third song to be depicted in this brief investigation *When We Grow up* was originally sung by Diana Ross, although it became much popular at the time of the special when being performed by Michael Jackson and Roberta Flack.

“When we grow up, will I be pretty?  
Will you be big and strong?  
Will I wear dresses that show off my knees?  
Will you wear trousers twice as long?  
Well, I don’t care if I’m pretty at all.  
And I don’t care if you never get tall.  
I like what I look like, and you’re nice small.  
We don’t have to change at all.  
Hey!  
When we grow up, will I be a lady?  
Will you be an engineer?  
Will I have to wear things like perfume and gloves?  
I can still pull the whistle while you steer.  
(...)  
When I grow up, I’m gonna be happy and do what I like to do,  
Like making noise and making faces and making friends like you.  
And when we grow up, do you think we’ll see  
That I’m still like you and you’re still like me?  
I might be pretty; you might grow tall.  
But we don’t have to change at all.

spoken: I don’t want to change, see, cause I still want to be your friend, forever and ever and ever and ever and ever and ever.”.

In the 1970’s parents certainly wanted their children to do anything they wished no matter their sex. Gender neutral parenting became not only a new fade but the proper way to raise children of those modern “1970’s” generations. I still do not understand what happened afterwards. Should have we continued the free-to-be-you-and-me ethics, things would have never got as bad as they

are today. In fact, nowadays any time we get into a toy store, for instance, we happen to be confronted with two very distinguishable isles; one is thoroughly pink-dyed whereas the other remains rather bluish. Even if we are as fortunate as to find a store with no boy/girl signage the publicity will have already applied its power. Accordingly, boys will head to the blue isle where they will find all those toys addressed to them on t.v., catalogues, books, schools and so on, i.e.; cars, trucks, heroes, footballs, construction sets, science games, spiderman suits, action figure comics, and so on. Girls, on the other hand, will not be offered such active options but more the type of nurturing, passive sets, i.e.; dolls (mostly non-posable), make-up kits, the pinkiest as possible princesses to be saved, cooking or cleaning play-sets, etc. The issue here is that however unconsciously, we are actually pushing our kids to certain careers and likes which will differ depending solely on their biological sex. It is about time we start yelling how being born with a vagina does not imply girls have a better aptitude at doing the housework than boys. Just the same as being born with a penis does not imply boys are better at engineering or worse at nurturing than girls. However, many of us will think we have life proof on our own children that girls love dolls and boys love cars, among many other examples. Neuroscientist Lise Eliot (2009), author of *Pink Brain, Blue Brain* proves us how this is not as easy as it seems. Let us consider for a minute; how many trucks have we bought our baby girls? How many more times have we told them to be quiet than to our baby boys who, “well, they are boys you know, noisy, rowdy.” How many princesses has your son been offered to play with? Of course most girls like pink and cutie things while boys are rowdy, prefer cars and non-pink things. But shouldn’t we ask ourselves why this is so? Neuroscience has got the clue and nature is only a small part of the answer. Scientists have learned how our brain does not stay the same way forever, i.e., the connections of our neurones differ depending on the environment which surrounds them. Hence, we are not born pink or blue but are absolutely taught how to be pink or blue from the very beginning, and as plasticity changes our brain we will actually become one or other colour depending on how we are nurtured (Eliot, 6). Sherman and Eileen L. Zurbriggen of the University of California are carrying out interesting research on the influence that certain toys may have on children’s future careers. Sherman says that playing with Barbie for instance “creates a limit on the sense of what’s possible for their future. While it’s not a massive effect, it is a measurable and statistically significant effect.” Experiments such as this should make us adults, be more alert at the time of acquiring certain books or toys for our kids.

### ***William’s doll***

William’s doll emerged as another icon of those 1970’s generations. The story relates how a little boy in need of carrying a doll to comfort him at the time of spending a night at a friend’s house is ridiculed all throughout the plot by his sister, his friends, his father, etc. See here below part of its lyrics.

“When my friend William was five years old  
He wanted a doll, to hug and hold  
“A doll,” said William, “is what I need  
To wash and clean, and dress and feed

“A Doll to give a bottle to  
And put to bed when day is through  
And any time my doll gets ill  
I’ll take good care of it,” said my friend Bill

A doll, a doll, William wants a doll  
Don’t be a sissy said his best friend Ed  
Why should a boy want to play with a doll  
Dolls are for girls said his cousin Fred  
Don’t be a jerk, said his older brother  
“I know what to do,” said his father to his mother

So his father bought him a basketball  
A badminton set, and that’s not all

A bag of marbles, a baseball glove  
And all the things a boy would love

And Bill was good at every game  
Enjoyed them all, but all the same  
When Billy’s father praised his skill  
“Can I please have a doll now,” said my friend Bill

A doll, a doll, William wants a doll  
A doll, a doll, William wants a doll”.

The moral of William’s doll is discerned by the protagonist’s grandma who makes his son see how the fact of William taking care of a doll will actually make him a better father in the future. This is commonly used in real life as a strategy to convince some adults how good it is for boys to have some “feminine” toys. Whatsoever, the real lesson should be that no matter their sex or gender kids may be able to play with whatever toy they find as fun, appealing or interesting (as long as it is ethical, of course). Why should we deprive girls of the enjoyable world of construction blocks knowing as we know that those kind of games are basic to ignite some neurone connections on their brains, hence improving their visual space abilities? Why should we prohibit boys to play with dolls when it has been proved that this kind of play encourages them to enhance their language skills, their nurturing capacities and their aptitudes to show empathy? There are definitely specific differences between the sexes but these are so tiny and malleable by nurturing that tends to be dissolved through time. The following extract will show how, in many cases, nature is highly influenced by nurture.

“For example, there is a belief that boy infants are more physically active than girl infants. There have been studies that have shown this, but what we are doing [in our current research] is analysing videos taken under naturalistic conditions in the home. We are doing second by second analyses of what’s happening, of free play and free interaction between mother and child. The mothers are spontaneously, in the course of the daily events of care, moving the little boy infants more than they are moving the little girl infants - picking them up, helping them sit up, and touching them a lot more physically. The gender-differentiated pattern of behavior on the part of the mothers also becomes part of how the infants’ sensory systems develop. So the actual development of the motor and neuromuscular connections, the synapses, all of what you think of as biology is being influenced by behaviors that are differentiated according to culture. You can’t partition nature from nurture. They are a developmental unit.” (Brazzell 2011, n.p.).

As far as schooling is concerned we cannot deny that throughout the course of time schools seem to have taken some steps towards equality and kids are now presented with many different kinds of toys in the classrooms. Nevertheless, as children grow up they tend to play only with those that they think belong to their gender. Hence, teachers must also work as guides not just by offering certain toys but encouraging kids to play with all of them (by taking turns for instance, or establishing different “playing-corners”) and explaining how boring it is having to choose between just “one of the aisles”. What is more, we could also make use of some children’s literature which challenges gender stereotypes. Books such as Jacob’s New Dress, Be Who You Are or Little Zizi will provide us enough subject matter to talk about masculinities, gender expression and gender identity in our classrooms. Parents at home have got to do their share of work too by providing their kids with a wide range of toys and inviting friends and relatives to offer kids non-gender stereotyped toys as gifts on birthdays or celebrations. As a society we could firm petitions such as those which denounce stores or toy-brands that perpetuate toxic gender stereotypes. For instance, LetToysBeToys has for some time now been working as a platform to have companies change their ways as regards the release of certain types of toys, or to denounce the stores for having a gender stereotyped signage in many of their departments. You may see how there are many different ways of challenging gender stereotypes it only depends on us to choose the best one.

### *It’s all right to cry*

Former football player Rosey Grier taught all the kids, boys in particular, of the 1970’s in U.S.A how it was ok to cry, if that was what they needed, through the use of this following song.

“It’s all right to cry  
Crying gets the sad out of you  
It’s all right to cry  
It might make you feel better

Raindrops from your eyes  
Washing all the mad out of you  
Raindrops from your eyes  
It’s gonna make you feel better

It’s all right to feel things  
Though the feelings may be strange  
Feelings are such real things  
And they change and change and change

Sad “n” grumpy, down in the dumpy  
Snuggly, hugly, mean “n” ugly  
Sloppy, slappy, hoppy, happy  
Change and change and change  
(...)”.

Emotions are another issue boys tend to be driven away from. Statements as “don’t cry”, “no fear”, or “don’t be sad” tell us how all emotions except for anger must be controlled and deleted in the case of boys. Fortunately, nowadays emotional intelligence experts are demonstrating how important it is for children to understand, show and deal with their emotions instead of inhibiting or ignoring them. Dr. William Pollack, psychologist and assistant at Harvard Medical School, uses the term the boy code (Real Boys, 6), to refer to all those cultural norms boys are supposed to follow to enter boyhood. Previous research carried out by professors Deborah David and Robert Brannon exposes four interesting points which consolidate the Boy Code too. These are: 1. the “sturdy oak”: which argues that boys must be stoic, tough, independent; 2. “give them hell”: this stance will lead boys to dare each other to show their superiority; 3. the “big wheel”: boys must avoid shame in every case; and 4. “no sissy stuff”: which does not allow boys show their feelings since it is regarded as a feminine act; i.e., sissy behaviour (as quoted in Pollack 23-24; Kimmel, What about, 8). R.W. Connell also joins this discussion “to emphasize that men do have emotional troubles, that masculine stereotypes can be damaging, that men suffer from isolation, and that men too can hold hands and cry - this is not a bad thing”(Men, 5).As Kimmel stated “masculinity is coerced and policed relentlessly by other guys. It it were biological, it would be as natural as breathing or blinking. In truth, the Guy code fits as comfortably as a straightjacket” (Guyland, 51). Educators should be extremely cautious with the hidden curriculum as they may unconsciously transmit this idea of boys having to avoid tears or any show of their feelings. In fact, varied exercises should be conducted within the educative practice so as to teach children how to deal with their emotions no matter their sex or gender. Let us include herein one of Daniel Goleman’s almost popular quotes is: “If your emotional abilities aren’t in hand, if you don’t have self-awareness, if you are not able to manage your distressing emotions, if you can’t have empathy and have effective relationships, then no matter how smart you are, you are not going to get very far”.

### ***Ladies first***

And last but not least I will include the sung poem Ladies First, a satire that makes reference to all those supposedly girls’ privileges, such as the one which names the story, in order to prove that they may actually hide a layer of sexism underneath. The protagonist of this story personifies what Kimmel calls “exaggerated femininities” or as coined by Connell “emphasized femininity” (Gendered, 16; Gender and Power, 183), which refer to girls and women having to forcedly be sweet, cute, pretty and good-mannered among other things. Nonetheless, what women are not told is that these exaggerated femininities do in truth imply them having to be weak, protected and saved by men all the time, thus affirming their inferiority.

“Did you hear the one about the little girl who was a tender, sweet young thing?  
Well, that’s the way she thought of herself.

And this tender, sweet young thing spent a great deal of time just looking in the mirror and saying:  
“I am a real little lady. Anybody could tell that.”

(...)

“I am also a little lady. You should know that by my lovely clothes and my lovely smell. And if it’s all the same to you, Tiger Tweetie, I wish you’d stop licking me. And untie me this instant! My dress is getting mussed.” “Yes... uh...” the tiger said. “Well, as a matter of fact, we were all just... uh... trying to decide who to untie first.” “Ladies first! Ladies first!” she said. And so she was. And mighty tasty, too.”.

In this story the protagonist eventually obtains her goal by getting to be the first in line before realizing that her privilege is no other than her own death since she gets to be eaten by the lions before anyone else. As educators we should never give girls any favouritism for the sake of being girls just as boys should not be the only ones demanded at the time of carrying out tasks which involve using their strength for instance, such as lifting some kind of weight (moving chairs or desks). Requests such as “Can I please have two strong boys to help me out here?” should be rewritten as “Can I please have two people help me out here?” no other mentioning required.

### **Concluding remarks**

People who lived through the era of feminism in the 1970’s were proud of raising their children in the Free To Be You And Me values and children of the 1970’s were the lucky ones to first break the mould of binarism. Notwithstanding, those children who are now parents themselves appear to be lost as regards clues on how to continue the same type of education they were awarded with. Toys, clothes, books and everything which surrounds infancy is now produced differently depending on whether it is addressed to boys or girls. What is worse, those items labelled as girls’ items strongly reinforce gender stereotypes of women being the only responsible for children, housework, nurturing, etc. And boys, who at first could be considered the privileged ones in this hierarchy, are actually missing many experiences related to emotions, such as not always having to be stronger, faster, or better than girls, which in many cases provoke anxiety for not being able to conquer such high goals. Our aim as educators (parents, teachers, psychologists, etc) should be re-breaking the gender stereotyped mould as it seems to not only have been put together again but it actually looks more solid than ever.

### **Implications for teacher education**

As Connell concludes at the end of *The Men and The Boys* (2000, 225) “the task is not to abolish gender but to reshape it”. This difficult task should be first manoeuvred from the top, i.e., we need governments to state gender education as an essential part of the curriculum, which in the long term would also reduce gender violence. This curriculum readjustment should be accompanied by workshops to educate teachers on how to avoid certain spread of gender stereotypes from the classroom and a deeper implication of the Teaching University Degrees so as to mould future teachers in the proper way. This top to bottom scheme has already been applied in many North European countries with the correspondent advances in equality as a society. Since it is not every country which has education as a national issue but many times politicians are the ones who decide on the topic we should then turn the scheme upside-down and begin from bottom to top. Accordingly, teachers should grasp as their duty to create future tolerant, open-minded humans and work incessantly on the gender-stereotyped issue through projects such as the one which has been hitherto exposed.

### **References**

- Brannon, L. 2011. *Gender: psychological perspectives*. Boston: Pearson.
- Brazzell, D. and L. Tyler. 2014. “A biologist moves past the nature vs. nurture debate.” *Footnote*, Dec. 11. <http://footnote1.com/a-biologist-moves-past-the-nature-vs-nurture-debate/>
- Butler, J. 1999. *Gender trouble: feminism and the subversion of identity*. New York: Routledge.
- Connell, R. 1987. *Gender and power: society, the person, and sexual politics*. California: Stanford

University Press.

Connell, R. 1995. *Masculinities*. California: University of California Press.

Connell, R. 2000. *The men and the boys*. Berkeley: University of California Press.

Darrow, W. 1970. *I'm glad I'm a boy! I'm glad I'm a girl!* New York: Windmill Books.

Eliot, L. 2009. *Pink brain, blue brain: how small differences grow into troublesome gaps-and what we can do about it*. Boston: Houghton Mifflin Harcourt.

*Free To Be You And Me* .2013. <http://www.freetobefoundation.org/index.htm>

Friends, M., and OverDrive .2013. *Free to Be...You and Me* (the 35th anniversary edition). New York: Running Press.

Kimmel, M. 2004. *The gendered society*. Second edition. New York: Oxford University Press.

Kimmel, M. 2008. *Guyland: the perilous world where boys become men*. New York: Harper.

*Let Toys Be Toys - For Girls and Boys*, 2014. Web. 10 June, 2014

Johnston, I., and J. Mangatt. 2002. "Making the invisible visible: stereotypes of masculinity in canonized high school literature. In *Ways of being male representing masculinities in children's literature and film*, edited by J. Stephens, 133-149. New York: Routledge.

Paul, A. 2010. *Origins: how the nine months before birth shape the rest of our lives*. New York: Free Press.

Pollack, W. 1999; 1998. *Real boys: rescuing our sons from the myths of boyhood*. New York: Henry Holt & Company.

Rabinowitz, R. 2004. "Messy new freedoms: queer theory and children's literature". In *New voices in children's literature*, edited by S. Chapleau, 19-28. Birmingham: Pied Piper Publishing.

Sherman, A. 2014. "Playing with Barbie's dolls could limit girls' careers choices". In *News and Research Communications*. Oregon: Oregon State University.

Taylor, F. 2003. "Content analysis and gender stereotypes in children's books." *Teaching Sociology* 31 (3): 300-11.

[Back to contents](#)





## **What do the teacher training students see when they look and what do they say they see when they are out on the observation in school for the first time**

*Steinar Karstensen*

*Oslo and Akershus University College of Applied Sciences, Norway*

Steinar.karstensen@hioa.no

### **Abstract**

The purpose of the study is to have a closer look at what first year students attending the Technical and Vocational Teacher Education and Training (TVET) programs at Oslo and Akershus University College of Applied Sciences (HIOA) experience when they are out for the first time making observations. The reason why they are out in observation is to make them familiar with their new profession and to acquire some experience that they can build on in their teacher education. We will in this paper look at (1) what they are concerned about when they make their first visit to the school. (2) What and how they observe and (3) how they interpret the school, the teachers, pupils, teaching and other activities related to education. The empirical data are obtained through freely written observation reports by 48 students from 2009 to 2013. The analysis is based on a phenomenological approach (Postholm and Moen 2009) and the use of Atlas.ti as an analytical tool.

**Keywords:** observation; TVET; profession; identity; transfer.

### **Context of the research**

This article discusses observations made by first year students attending the Technical and Vocational Teacher Education and Training (TVET) programs at Oslo and Akershus University College of Applied Sciences (HIOA). At the beginning of the program, it is mandatory for students who have not attended an upper secondary school in recent years, to make observations during one week when starting their teacher education (HIOA 2014).

These students have not yet had any significant training in observations and are free to describe what they see and reflect about what they are feeling and experiencing. What they see when they are out there, and what they say about that, is all about observations and their assumptions for their observations. In an observational context, it is easy to interpret. How you describe an observation will quickly contain interpretations that will depend on your own feelings, experiences and assessments (Johnsen 2013).

The purpose of the observation week is to gain an impression and have a point of reference to the teaching profession at the beginning of their teacher education. This way they can get some “hooks to hang things on” during the lessons. As previously mentioned, they are not trained in observations although they probably during the first introduction days have heard the term and maybe have been told about it.

We have done this for years without really examining it in a larger context. What triggered my curiosity was a review of my students’ reports where they referred to order and behaviour problems.

“The first hour was always quiet and the pupils participated, one of the reasons was that many of the pupils were gone the first few hours. Throughout the day, it became more difficult with a lot of turmoil and difficulty getting pupils to work or follow” (P15).

I thought that maybe this observations report provides insight into the school and about things that perhaps should be addressed for all the students. The whole purpose is to have a straightforward transition into the teaching profession.

Learning is discovering. What one discovers depends on what one sees (Grendstad and Sandven 1986). To get a good starting point for the transition from skilled worker to teacher training students and into the teaching profession, the link to the schools and the activities carried out in the practice field will be significant. By gaining a greater understanding of what they see out

there and how they describe it, we as educators, can help the students in the process of seeing, discovering and hence learn to develop their professional identity.

Norway has quite well established programs in technical and vocational education at the upper secondary school level. Altogether there are nine basic vocational education programs covering the areas of (1) Building & Construction, (2) Electricity & Electronics, (3) Technical & Industrial production, (4) Service & Communication, (5) Media & Communication, (6) Restaurant & Food processing, (7) Healthcare, Childhood & Youth Development, (8) Design, Arts & Crafts, (9) Agriculture, Fishing and Forestry. The basic vocational programs are related to 172 trades among which one can choose a journeyman certificate. This certificate can be earned after studying technical and vocational education for two years at the upper secondary level and having two years of practice as an apprentice in the work life (LK06 2006).

The students in this study are from the education program (1) Building & Construction, (2) Electricity & Electronics, (3) Technical & Industrial production, (4) Service & Communication, (5) Media & Communication. To get into the TVET teacher program it is mandatory to have a journeyman certificate and at least four years experience in the profession. The average age is around 40 and they do not have any significant training in observation before they get out there. The examination material was obtained from reports written by students that attended the program from 1999 to 2013. The students have not had the same teacher and the introduction to the observation week might have been different.

### **Research questions**

As mentioned in the introduction, will it be interesting to look at what they get out of the observation-week and if they need some more training in observation before they get out there. How professional must they be to get a benefit of the week in terms of getting a glimpse of the school?

We will in this paper answer the questions above and take a closer look at (1) what they are concerned about when they make their first visit to the school. (2) What and how they observe and (3) how they interpret the school, the teachers, pupils, teaching and other activities related to education.

### **Theoretical framework**

#### ***Observation***

When we observe, we have ourselves an emotional response. We can be happy, confident, interested, or maybe disappointed. This in turn affects what we notice and possibly how we interpret it. Refer to the adage: Everyone is stupid when I am crabby. We therefore have a tendency to perceive selectively so that we only perceive parts of a total picture. While we are observing it is easy to interpret what we see and hear. It is easier to bring your pre-conception based on something you assume in advance. These pre-conceptions can be both positive and negative. Often we tend to sift out what we notice in order to fit with the image we have formed in advanced. The term I believe it, when I see it, in this context, can be rewritten as, when I think about it, I see it. We do not respond on the basis of objective truth but from what we believe to be true (Johnsen 2013).

In essence, it can be said that there is no transmitter, but the receiver that determines the message. All events can be seen as a signal, which we transmit, processes to information and further to significant opinions. This is largely determined by experience and context as interpreted at the time (Halland 2004).

This can happen even if teacher observation is regarded as an essential procedure in the teacher training process. It often has a top-down approach when it is established by other people instead of the one being observed, such as school inspectors working for the administration. Although there are differences depending on the context, most teachers are unaccustomed to being observed. The observation can provoke uneasiness, nervousness, and tension. This can happen to

the observed person as well as to the observer. In addition, the observed person might think that his/her professional competence is being either questioned or judged (Lasagabaster and Sierra 2011).

### ***Professional identity***

Developing a professional identity is very important to become a successful teacher (Olsen 2010). Not only is the process of learning to teach a very complex matter. The teaching profession is constantly changing and it is also a very personal process. This includes, among other things, deciding how to express oneself in the classroom and how to adapt personal understandings. This means that there is a balance between the personal and professional side of becoming and being a teacher. If these sides are not in balance, the conflicts between the sides may emerge as tensions in the professional identity of new teachers (Pillen, Beijaard, and Brok 2012).

In addition, positive and negative emotions related to pupils and supervisors during the personal teaching experiences play an important role in social learning and, therefore, influence the development of professional identity (Timoštšuk and Ugaste 2012).

### ***Sequence of teaching concerns***

All student teacher brings into his/her teacher-training program a personal teaching schema, an individualized value system about teaching and learning. This also includes feelings, concerns and values (Boz 2008).

Fuller (1969) stated that teaching concerns show a developmental pattern in a teacher's professional life. In the beginning of their careers teachers have self-concerns about teaching, involving mastery of subject-matter knowledge, classroom management etc. At this stage, they typically worry about such questions as: Will the pupils like me? Can I control the class? What will parents and other teachers think of me? At this stage, teacher candidates are still closer to the student role, rather than the teacher role. Teacher candidates are often highly critical of the teacher with whom they are working. The second stage involves task-related concerns connected to the specific duties that teachers must accomplish on a daily basis. The concerns are usually about: Will I have sufficient time to prepare for class? How will I deal with large numbers of students in a class? At this stage, the teacher candidates become more involved in the classroom and begin to understand the magnitude of the profession. The concerns about pupils are replaced by concerns about class management and mastery of content. In the end, the teachers develop impact concerns regarding their pupils' needs and the effect of their teaching on the students' learning. The concerns are typically about the social, emotional and academic needs of their pupils (Boz 2008; Center, Watson, and Schoenblum 2000; Fuller 1969).

Several findings support the developmental sequence of teaching concerns presented by Fuller (1969). However, other studies point out that teachers' concerns appear simultaneously, rather than in a developmentally staged sequence (Boz 2008).

## **Research methodology**

### ***Type of research and data collection instrument***

The data are based on freely written observation reports by 48 students from 2009 to 2013 (P1-P48 2013). The analysis is based on a phenomenological approach, which has the purpose to illuminate the specifics and identify phenomena through how they are perceived by the actors in a situation (Lester 1999; Postholm and Moen 2009). Atlas.ti is used as an analytical tool.

In Phenomenology, the researchers are concerned with the study of experience from the perspective of the individual, “bracketing” taken-for-granted assumptions and usual ways of perceiving. So that it becomes a tool for understanding the subjective experience, gain insight into people's motivations and actions, and get away from assumptions and conventional wisdom. At the same time it is important to see that epistemological, phenomenological approaches are based on a

paradigm of personal knowledge and subjectivity, and emphasize the importance of personal perspective and interpretation (Lester 1999).

### *Validation of the instrument*

Phenomenological research can be robust in indicating the presence of factors and their effects in individual cases, but one must be careful not to generalize. The major challenge with phenomenological research is that it generates a large amount of interview notes, in this case 48, all of which must be analysed. The analysis can quickly become messy when the information obtained is complex and difficult to place in neat categories. At the same time there might be many ways to tie the various statements against each other (Lester 1999).

The analysis used Atlas.ti as a tool. All reports are analysed on the basis of different categories. See the analysis. A statement can come in several categories as it may relate to several of them. Following, the findings in each category were examined separately and in the context. A summary of the findings of themes and topics was then prepared.

In this context, the goal is to be faithful to the respondent, and be aware of the bias that is brought into the material in the inevitable editing that is needed. This is also an ethical issue that is important to be aware of. That is the distortion or deletion of statements given by respondents in good faith may occur (Lester 1999).

As mentioned earlier, it is difficult to conclude in this type of research because it suggests a finality and assurance that is not defensible. The discussions of the findings could form the basis for reflection and further work, provided it is made clear what is being done (Lester 1999).

### *Analysis*

I started to convert all files to the same format, PDF. This is because I discovered that Atlas.ti does not accept the different file formats of the reports handed in. The files were named with the serial number and year as 012009.pdf, 022009.pdf and so on and similarly for the other years. This was done in case that, at some point in time, it would be of interest to view reports from different years and compare them.

With a desire of not being biased, I started the analysis in Atlas.ti without having any previously defined categories or tags for the analyses. When starting on the fourth report, I found that the categories already created were not suitable for the new ones in the second reading. Therefore, there must be, all the way through, interpretations about what the categories ought to contain. Part of the challenge is that respondents write in their own way and with their own voice and approach. See validation of the instrument.

It was therefore essential to define some categories and limits for these. The categories were formed on the basis of the first readings. However, the categories I have with me, as a teacher educator, have certainly influenced my choices before the first analysis round anyway. This resulted in the following categories: (1) Didactic categories: learning experiences, evaluation, resources, objectives, content. (2) Implementation of learning activities: Plan, Implement, Evaluate. (3) Statements about: Pupils, Teachers, What do they observe feel, teaching profession, school. (4) Themselves and their own feelings: Future teacher, personal teaching preferences, Professional Identity, Tensions between their needs and the profession, Emotions: both negative and positive, self-assessment of the observation. (5) References to past experiences: Schooling, Employment, Current Studies. (6) Basic skills: ICT, Calculations, Norwegian. (7) Observation: meaning, event description, event description with interpretation and reflections. (8) Overall description of the implementation: location, time, trade, action plan. The categorization of the reports based on the above categories led to a significant amount of data. It is therefore not possible to analyse all categories fully in this article, which never have been the intention. The presentation of the results is therefore limited to those areas, which, in the first place, are clear in the review of the material.

## **Findings**

### ***Focus***

There were few students who have described what they would like to focus on during the observation. The few who mentioned something about it would focus on the teacher’s work and approach to the pupil. Maybe not as unnatural as it is this role they should enter in. It is quite likely that more students had an idea of what to look for even if they did not describe it.

“When I was going to be his” shadow “and observe his work, I chose to focus not only on”. What is a vocational tutor’s work during the week?” but also “What does he do in the classroom?”. This is because I would like to see his responsibilities as a teacher outside the classroom. Now when I have the chance to observe another teacher in practice and I want to learn as much as possible.” (P13).

### ***Pupils***

When they describe their experiences with their pupils, they focus on the pupils’ behaviour with perhaps a slightly negative attention directed towards noise, students’ lack of interest, lack of motivation and that “they do as they please”. They justify this perception by saying that they are listening to music, chatting, using their PCs when they should not, arriving too late if they come at all. They also observe that there are different levels of learners and that it is difficult for the teacher to cover everything. They also say that there is a difference in behaviour depending on contexts such as theory or practice, or between classes and between teachers.

“Another challenge I observe is that there are different levels of learners. Some are seated and wait for other pupils who are unable to keep up, because those are either not concentrated due to other things, such as phone, computer and games or those that do not understand what to do. She tells me often that she has great difficulty with the whole class, and that much time goes over to keep them calm and in order.” (P3).

At the same time it should be noted that not everybody thought that it was just noise and out of order all the time.

“The day was characterised by varied experiences and I think I got a good idea of how a school day appears to both teachers and pupils. I met with positive, polite and friendly pupils and days and hours passed quickly because of new themes, new pupils and new classrooms. What was relatively new to me was that they mostly sat quietly in their seats and there really was little disruption in the classroom.” (P28).

But most of all, it could seem that new teachers are most concerned to observe behaviour and discipline. Is it because it is a challenge in today’s schools, or because it is about having control over the situation they are moving into? Based on the theories of Fuller (1969) referred in the previous section, this concerns is not an unnatural approach as a first step. The idea might be that by controlling the pupils, the teachers believe they can control the learning processes.

### ***Teachers***

Here they describe the teacher in the teacher’s role in different ways, but mainly about how they act with the pupils. Some examples are: the teacher has good social conversations with students, puts the chair among the students, shows respect and equality, uses a lot of humor, listens, often uses himself/herself as an example, uses examples from real life, involves pupils in the topic and listens to them, welcomes questions, is clear and uses the voice well. At the other end are the teachers who ask the pupil to keep quiet “shut up, now I talk” method, miss the hours and is not available for the pupils. The last ones are examples taken from teachers who are not able to control the class.

“I hear many negative comments from the pupils and this interferes with the teacher. “May I help you with turning off the computer?” Asks the teacher. The mood is not particularly good. The teacher continues teaching. He wrote a theme on the board and tries to get students involved with the task. Some are motivated, while others are not concentrated and unmotivated. The situation is not under control from the teacher’s part, and the pupils take the lead in their own way. They ignore the teacher and start surfing the web. The teacher just gave up.” (P47).

Some have also been concerned with the education of students and believe that it is the proper education they are taking. While others believe colleges and extension incorporating pedagogy afterwards seem like the only right way. They also refer to activities outside the classroom as Personal Meeting. There is only one that mentions that the person who should be observed did not feel comfortable in the situation. Having the student to participate more actively solved this.

### *Student references*

Figure 1 shows the timeline for the students. The first eighteen years they have spent on their own schooling. From the age of about 18 to 40, roughly 20 years, they have worked within their own trade. When they are out in the observation they have been TVET teacher students for six weeks.

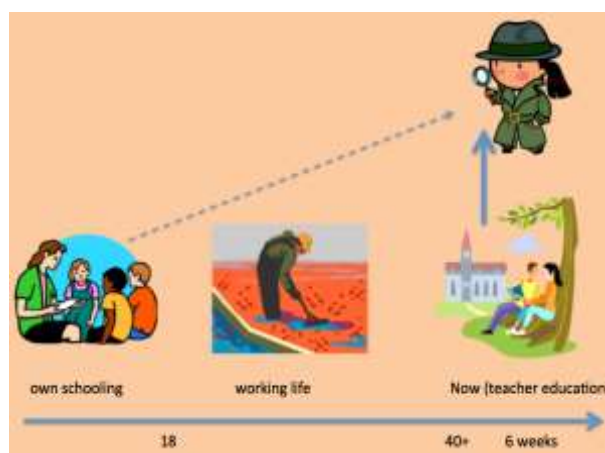


Figure 1. Student's life experiences

In their observations they often relate to Thomas Gordon and the book *Speak to us teacher*. It is like the title implies, which is communication and conflict management between teacher and student (Gordon 1999). This is the first book they read when they start their studies. “The teacher let it be up to the girls to come to a solution themselves. This looked like god solution. I recognized the traits from the book “*Speak to us teacher*” by Thomas Gordon.” (P17). Among the connections made by the students, there are a few references to their own schooling. However, there are virtually no references to their own work, except that they use technical terms and understand what the teacher does in class. “... it is the tool used in the training. (Mitre saw, planer, workstations, etc.)” (P26). While the last six weeks of teacher education are regularly mentioned, some of them go so far as to criticize the teacher they observed against the contents of the first book they have in the study. They act almost as experts in this area. “My thoughts on the challenges xxx has in the classroom is that xxx must define who owns the problem. Clearly xxx has ownership to the problem in many cases - Ref. *Speak to us teacher*” by Thomas Gordon” (P3). There is here an overlapping with the theories of Fuller (1969) described in the previous section on. Where there is a natural approach as a first step to be closer to the student role, rather than the teacher role and Teacher candidates are often highly critical of the teacher with whom they are working.

### *Basic skills*

In autumn 2006, the Ministry of Education and Research introduced the Knowledge Promotion Reform (KPR), which was a comprehensive curriculum reform. The reform places increased focus on basic skills and knowledge promotion through outcome-based learning. Under the Subject Curricula, the five basic skills are adapted to each subject and integrated. These skills are: (1) the ability to express oneself orally, (2) the ability in literacy and (3) numeracy, (4) the ability to express oneself in writing, and (5) the ability to use digital tools. These skills are basic in

the sense that they are fundamental to learning in all subjects as well as a prerequisite for the pupil to show his/her competence and qualifications. All subject-specific curricula (LK06 2006) describe how the five basic skills contribute to developing the pupils' competence and qualifications and how these skills are integrated into the subject. Each subject curriculum integrates competence aims, basic skills and subject content. The skills are consequently expressed in different manners and to a varying degree in the different curricula, depending on the relevance of different skills aspects for the subject in question (Udir 2013). When it comes to basic skills in what may be called the language if it is one or the other form, paragraphs 1, 2 or 4 above, so did none of the students mentioned it with the exception of one who chose to participate in a language teaching lesson in Norwegian. There are few who mention something about paragraphs 3 numeracy either. The exception is a couple of students who have been involved in a math class. They reported that they felt that the pupils struggled to figure it out and did not see what it would be used for. An exception is the description of the TVET teacher by this student: “The teacher went through basic surveying skills before they went out. Calculation of diagonal and vertical was taken on the board.” (P43). According to the knowledge promotion and the school debate that presently goes on in Norway this is the way it should be, while the example above is also typical. When a math teacher fails to relate education to work-relevant tasks for the pupils, they struggle to figure it out. When it comes to paragraphs (5) the ability to use digital tools they describe some use of ICT, but it is mostly as teaching equipment geared towards teaching. This means to use a projector and power point, possibly a video. There is just one example of the use of ICT in the subject. Most of what is written on ICT refers to ICT as a disruptive decrypted element in education. There is constantly a struggle between teachers and pupils with the teachers deciding when the computers should be turned on or off. “A student could not leave the screen down on their PC despite teachers' numerous requests. He eventually got a choice to leave class or storing the PC. He chose to put away the PC ... for a while” (P28). The corresponding results also came forward in a survey done among TVET teachers in 2013. Based on the responses in the survey, it seems that TVET teachers are, in a limited extent, using digital technologies (Karstensen 2013). When the student teachers also report that many teachers see it as a disruptive element in teaching, it might be an indication that there is a long way to integration.

### ***Didactic categories***

Figure 2 shows a model called relational model of didactic and is a model for planning and evaluating pedagogical activity. The model is commonly used in TVET teacher education in Norway. The Model consists of six categories or phenomena, and emphasises the relations between them. The idea behind the model is that it can be used as a planning tool in a teaching situation. It will then bring up the factors that will be important for a good preparation. The model can also be applied as a tool for analysis of activities. The categories are: (1) Learning experiences, which consist of the pupil's physical, psychological and social conditions for learning. (2) Resources refer to room, time, books, teaching equipment, curriculum and so on. (3) Objectives is what the pupils should achieve after the lessons. (4) Content is often the subject matter. It can be from a book, a film or maybe experiences from an activity. (5) Learning processes is the main part of the plan and include the pupils' action, teachers' action, learning methods and the atmosphere in the classroom, in short the processes that lead to learning. (6) Evaluation is about controlling or measure the learning and the teaching. It may include evaluating of the pupils learning and the teaching methods (Bjørndal and Lieberg 1978; Hiim and Hippe 2001; Inglar, Bjerkes, and Tobiassen 2002; Nilsen and Haaland 2008; Sylte 2013).



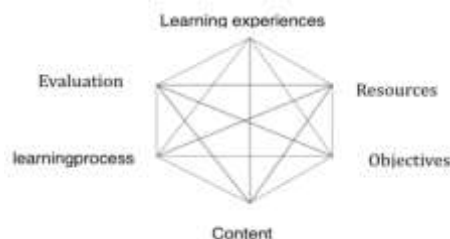


Figure 2. Didactic categories

### *Learning experiences*

In regard to learning assumptions or learning experiences, they referred to these as class assumptions or pupil behaviour in relation to discipline. It was also evident from some of the student teachers that it is important to differentiate or see the individual learner.

“I also thought a lot about that one class of students, consisting of many different personalities. To see all motivate everyone and especially adapting teaching in such a way that everyone can understand and create a foundation for learning, is a challenge that requires: good planning, basic knowledge of the subject from me as a teacher and a lot of patience. Reflection and creating participation/motivation in class is important.” (P24).

### *Resources*

They wrote little about which resources the teacher had to deal with directly. This is something that must be read between the lines. What come directly are some simple descriptions of how classrooms had a chalkboard and teachers used the projector. It was not so much around, for example, time, equipment and learning materials. This may be read between the lines. The question is do they not see this as resources. They are also more on the general description such as this.

“We were welcomed in a very nice way, I was shown around the building that was relatively new, completed in 1998, the school was built for modern learning philosophies and appear as bright, open and appealing, it seemed as if where the pupils had a positive attitude towards learning and presence.” (P19).

### *Objectives*

It may seem that the objective of education is a field they have not gotten any insight either. They have therefore taken the content of teaching for granted without knowing the purpose of it. There were only two student teachers who knew something about objectives of teaching, and two others who described their own possible targets based on what they had seen and experienced. “In this lesson, the student uses various hedging methods for screws” (P34).

### *Content*

When it comes to content, it may seem like they are better at putting words on it in terms of the content of the practical execution and overall content. Such as the demolition of the old patio before machines come and levelled, building garbage shed in the yard or something of more theoretical nature as a review of the use of consignment notes and course in fire protection by hot work. Detailed plans and operationalization of content for smaller sessions do not appear. This might, in principle, be good since vocational education is based on a comprehensive vocational task.

### *Learning process*

Here they describe the different learning methods that teachers use with the pupil. It extends from theoretical approaches to practice in the workshops at school and sometimes on mission. The teachers use different teaching methods as group assignments, tests, practical and theoretical tasks. They also describe how they do it: “... he puts conscious the bar high, so they must strive to achieve the basics ...” (P13) and that some teachers begin the day with a clear fundamental and pleasant

conversation, or that the teacher walks around and helps those who had raised their hands individually.

“On this subject there is a close reality lessons as possible, so the transition to working life should not be too large. Students use computers to read and solve weekly exercises. There will be group work. Students work partly independently with help from the teacher that moves between the different groups. There is a good mix of theory and practice. And at the end of the week they get a test subject.” (P45).

### *Evaluation*

There are not many teachers touch this category. The few cases are dealing with a teacher who asks students about assessment of the day, two teachers discuss the grades they give, pupil returned results of a test they had and that students undertake self-assessment of their work. Highly relevant and great evaluation situations, but as said, not many people have touched this category.

### **Conclusions and implications for teacher education**

I started my analysis, which resulted in this article, because I became curious after a review of my students’ reports in which they described problems associated with order and behaviour. In a review of several years, it turns out that this is quite consistent and nothing special. As described in theory this might be explained by the fact that new teachers feel they have to cope with the situation and this is then a natural objection. That does not mean that noise in the classroom is not a problem, but it is rather as an explanation for why it occupies an important place in the report of the students. What is more challenging and perhaps some useful information, is that the noise reported in the classroom is a result of ICT. ICT is here to stay and it is something that is used everywhere in society, but when it comes to school it is perceived as a noise element. This forms a basis for further research and development work on how to handle this complex challenge in the future. What they see and what they describe in terms of didactic is mainly focused on work methods and slightly less in content, objectives and evaluation. Frames are described in general terms in relation to school buildings (if it is new) and the number of pupils. There are no reviews for equipment as related to the occupation. Regarding teacher preparations and complementary work, which certainly is not easily observable, it is not described in any significant degree, with the exception of a few common meetings. In relation to a comprehensive insight into school life, there are some items that are not discernible or easy to grasp. What surprised me most is that they go into the role and operate mission activities on the teacher, based on the limited insights they have through just six weeks as TVET teacher student. And how little critical they are in relation to the training that takes place in relation to their own professional experiences through twenty years in the trade. Nobody expresses that the week has been negative even for the one that started with a somewhat negative experience as to be sent home in order to get the safety shoes. On the contrary, they express that some of the tension of being a teacher is gone and they are looking forward to a bright future in the new profession. As I see it, this has been a useful review. It has given insight into what the teacher training students see when they look and what do they say they see when they are out on the observation in the school for the first time. This is useful knowledge to be kept in the further development of the students. As described, they meet the observation week without observation training. An alternative would have been to do some training in advanced, but from what they have written, it seems like they pick up what concerns them from their point of view. Based on my insight and awareness gained through this analysis, I find that it will provide a greater benefit to continue as it is, instead of expecting that the students will prepare professional observation reports. They might then be more concerned about the report itself than looking at the school day with an impartial eye.

### **References**

Bjørndal, B., and S. Lieberg. 1978. *Nye veier i didaktikken? En innføring i didaktiske emner og begreper*. Oslo: Aschehoug.

- Boz, Y. 2008. “Turkish student teachers’ concerns about teaching.” *European Journal of Teacher Education* 31 (4): 367-377. doi: 10.1080/02619760802420693.
- Fuller, F. 1969. “Concerns of teachers: a developmental conceptualization.” *American Educational Research Journal* 6 (2): 207-226. doi: 10.3102/00028312006002207.
- Gordon, T. 1999. “Snakk med oss, lærer! Trening i kommunikasjon og konfliktløsning”. In *T.E.T. Teacher effectiveness training* edited by N.Burch, T.Seljelid, and T. Winje. Oslo: Grøndahl Dreyer.
- Grendstad, N., and J.Gunnhild. 1986. *Å lære er å oppdage: prinsipper og praktiske arbeidsmåter i konfluent pedagogikk*. Oslo: Didakta.
- Halland, G. 2004. *Læring gjennom stimulerende samspill: veiledning, vurdering og ledelse*. Bergen: Fagbokforl.
- Hiim, H., and E. Hippe. 2001. *Å utdanne profesjonelle yrkesutøvere*. Oslo: Gyldendal akademisk.
- HIOA. 2014. “Bachelor’s programme in vocational teacher education.” <http://www.hioa.no/>
- Inglar, T., E. Bjercknes, and T. Tobiassen. 2002. *Learning and counselling*. Kaunas: University Akershus University College.
- Johnsen, B. 2013. *Hva ser jeg når jeg ser? Og hva sier jeg at jeg ser? Oppmerksomhet, observasjon, tilbakemelding*. Oslo: Høgskolen i Oslo og Akershus.
- Karstensen, S. 2013. “Norwegian TVET Teachers use of new technologies.” Paper presents at the ATEE: Educating for the future, Halden.
- Lasagabaster, D., and J. Sierra. 2011. “Classroom observation: desirable conditions established by teachers.” *European Journal of Teacher Education* 34 (4): 449-463. doi: 10.1080/02619768.2011.587113.
- Lester, S. 1999. “An introduction to phenomenological research.” *Stan Lester Developments*: 1-4.
- LK06. 2006. “Curricula upper secondary education and training in knowledge promotion.” In *Norwegian Directorate for Education and Training*. Oslo: Udir.
- Nilsen, Si., and G. Haaland. 2008. *Læring gjennom praksis: innhold og arbeidsmåter i yrkesopplæringen*. Oslo: PEDLEX norsk skoleinformasjon.
- Olsen, B. 2010. *Teaching for success: developing your teacher identity in today’s classroom*. Paradigm Publishers.
- Pillen, M., D. Beijaard, and P. den Brok. 2012. “Tensions in beginning teachers’ professional identity development, accompanying feelings and coping strategies.” *European Journal of Teacher Education* 36 (3): 240-260. doi: 10.1080/02619768.2012.696192.
- Postholm, M., and T. Moen. 2009. *Forsknings- og utviklingsarbeid i skolen: metodebok for lærere, studenter og forskere*. Oslo: Universitetsforl.
- Sylte, A. 2013. *Profesjonspedagogikk: profesjonsretting/yrkesretting av pedagogikk og didaktikk*. Oslo: Gyldendal akademisk.
- Timoštšuk, I., and A. Ugaste. 2012. “The role of emotions in student teachers’ professional identity.” *European Journal of Teacher Education* 35 (4): 421-433. doi: 10.1080/02619768.2012.662637.
- Udir. 2013. “Curricula in English.” <http://www.udir.no/Stottemeny/English/Curriculum-in-English/>
- Watson, M. and A. Schoenblum. 2000. *Company in your classroom: building a learning relationship with your student teacher*. Developmental Studies Center.

Back to contents

## Playing with mathematics can be a successful way to teach it

*Donatella De Tommaso & Simonetta Di Sieno*

*Università degli Studi - Milan, Italy*

donatella.detommaso@unimi.it & simonetta.disieno@unimi.it

### Abstract

In this paper we are presenting and examining the effectiveness of a training activity for primary and lower secondary school mathematics teachers. The teachers were asked to experiment with the Problem Based Learning (PBL) approach in their class, by asking their pupils to work - directly in touch with the researchers working for the Centre “matematita” - on some “special” problems available in an archive run by “matematita”. These problems were apparently difficult but attractive and could be worked out at different levels. Our aim was to investigate if the problems and the methods were suitable for learning mathematics in the long run and to find out if the activity might help teachers in their work. From the evaluation forms filled out by the participants we found out that teachers appreciated the proposed kind of active learning and are planning to use it in different situations. As for pupils, the evidence is that they improved their communication and relation attitudes.

**Keywords:** problem solving; in-service teacher education; use of the language; co-operative learning.

### Context of the research

This paper presents a training activity developed for in-service teachers which was tested during the school year 2013-2014, highlighting the aspects that make this proposal effective. We will first describe the methodological instructions and the material provided to the teachers and then analyse the results, both positive and negative, from the evaluation forms filled out by the participants.

The activity was organized by the Research Centre for Communication and Informal Learning of Mathematics “matematita” ([www.matematita.it](http://www.matematita.it)). Since its foundation, the Centre has been looking for new topics and methods to communicate mathematics in a more effective way with emphasis on speculation and ideas rather than analytical demonstrations and mechanical drills. This allows people to approach the subject rather informally and to discover formal language at the “right” moment, i.e., when they try to describe, for instance, regularity properties and to come up with general statements about them.

Last year, the Centre worked on a national project together with the “Accademia dei Lincei” ([http://www.lincoeistruzione.it/beta/?page\\_id=682](http://www.lincoeistruzione.it/beta/?page_id=682)). The project tested new methods, especially designed for scientific and language skills, to help students to develop creativity and apply the famous scientific method in class. In particular, teachers from the primary and the lower secondary schools were asked to practise Problem-Based Learning (PBL) in their classes and were tutored through different stages.

“PBL focuses on acquiring knowledge and skills by analysing and solving representative problems. Learning often occurs in small groups under the guidance of a teacher who act as a facilitator. New information is acquired through self-directed learning and the problems are used as means to gain the acquired knowledge.” (Dochy et al. 2003).

At the beginning, we met all teachers and gave them the material, providing explanations about their work. During their whole activity, they could talk to each other and ask for help via email to a member of the “matematita” staff. At the end of the activity, we met them once again and asked to evaluate the project.

### Research aim

The aims of this work were to test if the chosen problems were suitable for learning

mathematics in the long run, to propose a new (or rarely used) teaching method and to find out if the activity could help teachers to improve their teaching skills.

## **Theoretical framework**

### ***The rationale***

The National Centre for Excellence in the Teaching of Mathematics in England conducted a one-year research study to identify the features of effective mathematics teaching. They concluded that it is not possible to identify a single best method, but there are many different types of learning and many different methods that should be applied including the use of higher order questions, encouraging reasoning rather than “answer getting” and developing mathematical language through communicative activities (see Swan et al. 2008, 4). In Italy, however, a rather poor mathematical background of the majority of mathematics teachers in the compulsory school is a great obstacle towards this kind of procedure. Teachers without personal mathematical experiences are too often led to restrict their interest, curiosity and abilities within the context of the school curriculum and passively reproduce models of teaching/learning they underwent as students.

In the early 1970s, Kolb and Ron Fry developed the Experiential Learning Model (ELM), composed of four elements: concrete experience, observation and reflection on that experience, formation of abstract concepts based upon the reflection, testing the new concepts. (See Kolb 1975). It is very difficult for the teacher to help pupils to go through these same passages without a direct and personal “mathematical experience”. In order to overcome this difficulty, the Centre “matematita” proposes a series of activities directed to mathematics teachers at the beginning of their career or in-service. The strategy we propose asks them to do and to learn by doing and reflecting on it.

The phrase “Playing with Mathematics” intends to set up a playful atmosphere where groups and classes play ones against the others; so the students are motivated to keep up with schoolwork because of different reasons (the context, the victory, etc.). Indeed, at the end of the activity, it was natural to rank the players and to give prizes to the winners.

In the context of education, learner’s motivation may be defined as “a range of an individual’s behaviour in term of the way they personally initiate things, determine the way things are done, do something with intensity and show perseverance to see something through to an end” (as quoted in Lord et al. 2005, 4). As Lord points out, student’s motivation is related to a range of concepts such as self-concept, learner engagement, capacity to develop learning strategies or to bear anxiety and attitude toward education (89). The literature distinguishes between two motivational concepts: intrinsic and extrinsic. (Decy and Ryan 1985). Our activity was designed to increase and activate both intrinsic and extrinsic students’ motivation.

At the Centre “matematita”, we do believe that language is extremely important for this kind of activity. It is closely related to the development of thought. The use of some expressions, such as at least, for all, if and only if, etc., is relevant to express a concept unambiguously. The text of the problem was rather elaborated so that the students were almost forced to ask questions. They were asked to write down their answers and to explain how they managed to choose an answer rather than a different one - this is rather unusual in mathematical activities. To write down doubts and answers helps to clarify one’s thought especially when it is the output of a preliminary discussion within a group.

“Mathematics is about problem solving, and reading comprehension is an important component, especially for word problems. Writing, too, is a critical component, because students should monitor and reflect on the problem-solving process as well as communicate their thinking during problem solving.” (Heidema 2009, 2).

### ***Context: teacher knowledge and teacher education in Italy***

Teachers working in primary school generally have a weak mathematical knowledge, but a good pedagogical education. Teachers working in lower secondary school have a stronger mathematical knowledge, but a really weak pedagogical education. Some of them are more competent about science than mathematics and even if they teach mathematics and science, their background is not always solid. Mathematics teachers working in the higher school have a good mathematical provision but often only experienced teachers know how to pass down their competences to the students.

Nonetheless, very little initiative is taken by the government about professional development, contradicting what is suggested about this matter in EACEA P9 Eurydice: “However in order for teachers to be able to provide this flexibility and be capable of selecting the most appropriate approach at any given time, it is crucial they have access to effective professional development” (2011, 70). Usually teachers voluntarily take part to professional development courses promoted by different agencies but they do not receive any recognition for this.

In Italy, teaching methods are not centrally prescribed, but Italian National Standard for Mathematics (<http://www.indicazioninazionali.it/J/>) underline that:

“Caratteristica della pratica matematica è la risoluzione di problemi, che devono essere intesi come questioni autentiche e significative, legate alla vita quotidiana, e non solo esercizi a carattere ripetitivo o quesiti ai quali si risponde semplicemente ricordando una definizione o una regola. Gradualmente, stimolato dalla guida dell’insegnante e dalla discussione con i pari, l’alunno imparerà ad affrontare con fiducia e determinazione situazioni problematiche, rappresentandole in diversi modi, conducendo le esplorazioni opportune, dedicando il tempo necessario alla precisa individuazione di ciò che è noto e di ciò che s’intende trovare, congetturando soluzioni e risultati, individuando possibili strategie risolutive. [...] Un’attenzione particolare andrà dedicata allo sviluppo della capacità di esporre e di discutere con i compagni le soluzioni e i procedimenti seguiti.” (Solving problems is an activity which is characteristic of mathematical practice; here we mean a problem is a true and significant question, linked to everyday life, and not a mere set of repetitive exercises, or questions where the answer is just given by remembering a rule or a definition. Gradually, urged by the teachers’ guide and by the discussions with their schoolmates, the pupils will learn to face problematical situations with determination and trust in their own capacities, by representing them in different ways, by trying the appropriate tests, by using the amount of time which is necessary in order to determine precisely what is already known and what they intend to find out, by making conjectures on solutions and results, by finding possible solving strategies. [...] A special attention has to be paid to the development of their capacities in explaining and discussing with their schoolmates the solutions they found and the procedures they followed.)”.

We believe that teachers are familiar with the PBL approach, but few of them practise it, because they get easily lost when they encounter some difficulties.

## **Research methodology**

### ***Implementing the project***

During the first meeting, the teachers were split in groups according to the school they taught in. The teachers of each group had to discuss problems taken from the archive <http://www.quadernoaquadretti.it/giochi/archivio/index.php> and to choose a list of four problems on different topics. They had a week to go through the problems and tell us about possible changes they would make. Since they did not know what to expect, they were not proactive... Then they had to present the problems to their students. They told the class that a pupil from another country or a mathematics education researcher was asking for their help. As in a play, they pretended to have information from this outer person and the students pretended to believe it.

The students tried to solve the problems working in groups. They were asked to send their solutions to the researchers working for the Centre via the website [www.quadernoaquadretti.it](http://www.quadernoaquadretti.it).

The researchers read their solution, fostered good ideas and explained mistakes. And the group found the comments on the website. During the classwork, the teachers had to act as facilitators: they helped the students who were completely lost or they monitored the activities of the groups and assigned roles, e.g., the reader, or writer, etc.

For each stage, we handed the teachers some notes with hints to the solutions, a brief description of the mathematical contents and some “nudges” to schoolwork with pupils. In general,

all the problems were not for amateurs of mathematical games nor puzzles; they were chosen to make students more confident with mathematics and feel less scared by this subject. Particularly, they were intriguing by the way they were presented: they involved historical characters or boys and girls from other cultures and countries.

The problems shared some attributes: they were difficult enough for the students they were addressed to; they could be solved in more than one way; they served as an introduction to new topics or to revise already presented ones; for them, computation was not essential, although it sometimes requested and lastly they were written with a particular attention to language so that the students had to read them carefully.

### ***Active involvement of the teachers***

At the beginning we had to encourage the teachers to try this method, because we were told about the following troubles: the students found some topics too difficult; the students didn't get to an agreement in the group; the teachers could not resist in helping students with solutions. We suggested that the teachers could give gentle suggestions to the students, but not help them to work through the problems. At most, it was advisable to read the text with the youngest pupils or show them the material, or tell them to write down what they had come up with, so they could clear up their mind.

After the first two stages, we asked the teachers to write comments to their students without letting them know who they were. They did not play the role of a usual teacher, who grades and corrects their papers, but played the role of an expert friend who stimulates their work and learns from their mistakes.

The most difficult task for the teachers was to write the text for the final activity, although they were considerably supported to various extents. This final activity was designed to test the knowledge of a specific topic and the ability to solve problems related to the topic. It consisted in distributing a list of problems, of the same kind of the one assigned earlier, but shorter and not too similar.

### ***The evaluation methodology***

The evaluation of the activity was based on an evaluation form that the 44 teachers who completed the educational path were asked to fill in. This form concerned both the experimental work they did with their classes and the tutoring activity they benefited from.

As for the first aspect, the questions were of at least three different kinds. On one side, we wanted to check the improvement in knowledge of the students for each laboratory session (the project was based on five sessions, and the students had to solve one problem for each of the first four meetings and four shorter problems in the last meeting); so, for each problem, we asked the teachers to evaluate the progress made by the students in their mathematical proficiency, by indicating a starting level and a final level for each of the proposed topics. On the other side, we wanted to know how pupils behaved in their search for the solution of the problems, in particular whether they did use some household objects or manipulatives and/or if they used some graphical representations to come up with the solutions. Furthermore, we meant to check the change of attitude of the whole class regarding those transversal capabilities such as feeling less lost when trying to solve non-standard problems; growing of curiosity; willingness to read more elaborate texts and to justify answers; different attitude towards group work.

Another kind of evaluation regarded the tutoring activity directed to teachers. In order to check the effectiveness of this aspect, the kind of questions we asked teachers involved the activity of writing problems along the lines of those proposed by “matematita”, interesting aspects emerged while writing comments to their or another colleague's students (as an outsider person), their willingness to change the experimental schoolwork in order to be more adequate to the students' needs and also their willingness to continue the experience with the proposals of the Centre as a tutor or as a participant.

## Findings

All the data reported in the following paragraphs come from the teachers' opinions.

### *Knowledge improvement*

Table 1 shows the students' advance in content knowledge and Table 3 shows the students' improvement in skills and attitudes. These data show some trends; but, as a general remark, we cannot in fact attribute a statistical and scientific value to the subjective evaluation of the behaviour of a heterogeneous group such as a class.

Table 1. Teachers' evaluations of progress by their classes

Session	First, second grade primary school (6-8 years old)		Third, fourth and fifth grade primary school (8-11 years old)		First, second grade lower secondary school (11-14 years old)	
	Advance	Strong advance	Advance	Strong advance	Advance	Strong advance
1 <sup>st</sup>	12/13	5/13	18/18	11/18	11/13	8/13
2 <sup>nd</sup>	13/13	7/13	17/18	14/18	10/13	4/13
3 <sup>rd</sup>	11/13	7/13	18/18	15/18	10/13	6/13
4 <sup>th</sup>	11/13	6/13	18/18	14/18	9/13	6/13

We present here some examples in order to clarify how to read the data of Table 1. During the first meeting, 12 out of 13 of the first and second grade classes realized some progress (and 5 of them a substantial progress), as reported by their teachers, while 1 (13-12) of them did not record any progress. During the last meeting, 18 out of 18 of the third, fourth, and fifth grade classes realized some progress (and 14 of them a substantial progress). During the second meeting, 10 out of 13 of the lower secondary school classes realized some progress (and 4 of them a substantial progress), while 3 of them (13-10) did not record any progress.

We choose not to test the students nor the teachers individually, because the evaluations of such experiences need to consider many complex factors and we think that the proof of effectiveness of PBL activities cannot be given by mean of quantitative analysis.

### *Use of objects or manipulatives*

As a second question, we asked the teachers if students had asked or were invited to use some household objects or manipulatives or if they used some graphical representations to come up with the solutions (Table 2).

Table 2. Frequency of use of manipulatives

Use of...	Primary school		Secondary school	
	Only in one meeting	In more than one meeting	In at most one meeting	In more than one meeting
objects	17/31	14/31	10/13	3/13
schemes	-	31/31	6/13	7/13

Seventeen primary school teachers out of 31 did not use any material or used it only in one meeting. When the material was used, it was usually proposed by the teacher and only rarely requested by the students. All the teachers from the primary school used diagrams and schemes. 10 lower secondary school classes out of 13 used some material in at most one meeting. Only 3 teachers used some material because they were asked to do so by the students. Only 7 classes out of 13 used schemes and representations in more than one meeting. Schemes and representations are



probably more used in primary school. We cannot conclude that the proposed problems helped teachers in using this type of support to come up with new strategies for solutions.

Our data show a different trend in the lower secondary school, where the students are expected to work in a more formal and abstract way, and not to manipulate objects, schemes nor representations. But we believe that these tools can be useful at any age and at different levels.

“The use of concrete objects to represent examples of abstract problems and concepts is quite a delicate issue, one with enormous potential, but which should also be used with a degree of caution. [...] When such care is taken it is precisely the acquisition of the abstract concepts that benefit from the manipulation of concrete objects.” (Dedò and Di Sieno 2013).

### ***Skills and attitudes improvement***

We then asked the teachers to evaluate how some parameters involving the whole class had changed for the duration of the project. In particular, we asked whether: the students were less and less lost when they tried to solve non-standard problems; the students’ curiosity grew or was constant; the students were more willing to read more elaborate texts; the students were more inclined to justify their answers and not only sketch them; the students had a different attitude towards group work (Table 3).

Only 6 out of 44 teachers did not report any improvements for all parameters. We thought it was worth mentioning the number of teachers (or classes for lower secondary school) with a “meaningful” progress. We asked them to mark the initial and the final situation with a number between 0 and 5. It was “meaningful” for us to have a two-point difference between the initial and the final situation.

The following sentences can help read Table 3. The total number of 1st grade and 2nd grade teachers was 13, and they answered in the following way:

- 9 of them reported that the students were less lost (2 points);
- 8 of them reported that the curiosity was high and constant;
- 5 of them noticed an improvement in reading elaborate texts (2 points);
- 5 of them noticed that the students were more capable to express their arguments;
- 5 of them reported a better attitude towards group work.

Table 3. Evaluation of skills and attitudes improvements

	First, second grade primary school (6-8 years old)	Third, fourth and fifth grade primary school (8-11 years old)	First, second grade lower secondary school (11-14 years old)
Being less lost	9/13	13/18	6/13
Keep a good level of curiosity	8/13	9/18	6/13
Willing to read elaborate texts	5/13	7/18	3/13
Inclination to justify answers	5/13	8/18	4/13
Better attitude towards groupwork	5/13	5/18	3/13

Thirty primary school classes out of 31 kept their motivation alive; 9 of them could not organize a final answer for the whole class, and 23 of them could recognize the topics proposed during the previous labs (Table 4).

Table 4. Student’s behaviour in the final challenge

Student’s behaviour	Primary school	Lower secondary school
Keeping motivation alive	30/31	7/13
Groups collaborate to produce a unique solution for the whole class	22/31	6/13
Recognizing the previous labs’ topics	23/31	11/13

Twenty seven primary school teachers answered that the project was very useful; 3 of them said that it was fairly useful, and one of them wrote that the project was partially useful (Table 5).

Table 5. Teachers’ judgment about the usefulness of the training

Usefulness of the training	School level	Very useful	Enough useful	In part useful	Not useful
For the students	Primary	21/31	7/31	3/31	0
	Secondary	5/13	5/13	3/13	0
For the teachers	Primary	27/31	3/31	1/31	0
	Secondary	8/11	2/11	1/11	0

### ***What have teachers learned?***

We asked each teacher to point out some interesting aspects emerged while writing comments to their or another colleague’s students (as an outsider person). Some teachers of primary schools wrote that their answers were more detached, as well as more customized. If an evaluation is not mandatory, teachers and students can interact and entertain themselves. Other teachers noticed that this type of answers helped students to be more self-confident. Teachers of lower secondary schools appreciated the possibility to express themselves more freely and noticed that students were more inclined to listen to suggestions coming from outside the school. This activity pointed out quite a few positive aspects. This approach is beneficial for both the students and the teachers, since both sides can learn from mistakes and change any misconceptions. Kyriacou and Issitt (2008, 13) reviewed 15 papers and concluded that “the quality of teacher-initiated teacher-pupil dialogue to promote pupils’ conceptual understanding needs to be improved.” In particular, they found that “the enhancement of pupils’ self-knowledge concerning how to make use of teacher-pupil dialogue as a learning experience” was of particular importance.

We also asked the teachers if it was helpful and useful for them to write the problems along the lines of those proposed by “matematita”. Primary school teachers were stimulated because they were asked to think about some topics and how to introduce them to verify the capability of the students. In order to choose the questions and the progression to follow in questioning, the teachers have to see the problems with the eyes of the students. They have to be original avoiding traditional problems, though having some connections with everyday’s life, so that students are more motivated to answer the questions. This task was difficult for most of the teachers. Another innovation was the request to justify the answers, not at all common in textbook problems. As for lower secondary school teachers, they pointed out that the task was difficult, but necessary. They also appreciated that they had to think of scenarios where the answer is not the application of a formula. For other teachers, the activity was an occasion to go over new, or forgotten, topics by developing captivating problems that mixed rigor and creativity.

Usually, teachers do not create problems. As shown in the evaluation forms, this task was very useful for them, even if they found it rather difficult. In order to ask non-trivial questions, it is, in fact, important to master and understand a topic even more than to give the right answer. As Bennett asserts:

“Effective formative assessment practice is domain specific, that is, it is not the same in different subject

areas. He goes on to state that a key implication of this is that 'a teacher who has weak cognitive-domain understanding is less likely to know what questions to ask students, what to look for in their performance, what inferences to make from that performance about student knowledge, and what actions to take to adjust instruction'. (2011, 15).

### ***Which changes should be introduced?***

We also asked the teachers how they would change the experimental schoolwork to be more adequate to the students' needs. The majority of primary school teachers would make texts shorter. The same number of teachers would like to have more time to recap at the end of the lab. 30% of the teachers would prefer to give more hints to the students. Finally, some teachers demanded some evaluation tools for their students and other activities (not necessarily with the same approach) to consolidate the learning about a specific topic; moreover, more meetings during the school year would be appreciated. Lower secondary school teachers would dedicate more reflection on sorting the groups, and would devote more attention to lead the final outline. They also asked for problems having more connections to other science branches, since they teach both mathematics and science.

We also asked the teachers how they would change the course they were given. The majority of primary school teachers wished they could have support - maybe online - during the experimental work in class. Some of them expected more meetings with the organizers and colleagues; some others would prefer that an outreach mathematician from the Centre “matematita” was present during experimental labs. Most of them were satisfied and did not ask for any change. 4 out of 11 secondary school teachers required more opportunities for discussion among colleagues during the project, 5 did not make any proposals, one gave more targeted suggestions on the structure of the problems and expressed the need for pedagogical tools.

At last, as for suggestions of different topics, among the primary teachers, 10 of them were satisfied with the topics we proposed. They also admitted that the archive included quite a lot of interesting topics. 8 of them asked for more geometry; 6 of them would like to work on probability and statistics and 6 of them were interested in history of mathematics, sequences, logic and integers, etc. Lower secondary school teachers implicitly or explicitly pointed out some topics from curricula, such as solid geometry, congruencies, fractions, etc. Some of these topics are already developed in the archive. New topics are statistics, rounding, logic, applied mathematics and so on.

### ***Continuing the experience***

We also asked how many teachers were willing to continue the experience as a tutor or as a participant. The data are shown in Table 6. Ten out of 11 lower secondary school teachers were available to continue next year, either as tutors and/or participants. 1 of them declared not to be ready to continue as tutor: 1 of them was not interested.

Table 6. Willingness to continue experience

Type of school	As a tutor	As a participant	Not interested in continuing
Primary school	11/31	13/31	7/31
Secondary school	9/11	1/11	1/11

### **Conclusions and implications for teacher education**

The teachers appreciated the method as well as the problems. They discovered that a new relation with their pupils is possible. Teaching via problem solving and labs motivates students to enjoy mathematics and enables a dialogue between the students and the teacher. During these activities, most of the teachers became aware of the skills and the proficiency that the students had, which cannot be neglected at the moment of evaluating their growth.

The teachers would like to continue this kind of experience with their students, but they still need to be supported. By “support” they mean the following: the material is already available so that it is easier to design a lab activity; it is easier to interact between colleagues; there are tools for

evaluating teachers’ and students’ work; they have time to ask students some reflections on the activities done in class.

Students, on their part, need some training on communication skills, i.e. reading elaborated texts, discussing within the group, explaining their strategies and their findings. For instance, we believe that elaborate texts should be introduced gradually and not only for special activities. The activity we proposed seemed to be more effective for fourth and fifth grade and less developed in sixth and seventh grade.

In a sense, the project was more useful for the teachers involved than for the students. This shows that we still have to experiment more to create the right framework.

“The reality is that learners who are new to PBL require significant instructional scaffolding to support the development of problem-solving skills, self-directed learning skills, and teamwork/collaboration skills to a level of self-sufficiency where the scaffolds can be removed. Teaching institutions that have adopted a PBL approach to curriculum and instruction have developed extensive tutor-training programs in recognition of the critical importance of this role in facilitating the PBL learning experience.” (Savery 2006, 15).

Every teacher should keep track of his/her experience if he/she would like to organize a similar experience in the next future; however, classes and students change quite a lot from one grade to the other, so he/she should be flexible and take into account how the students grow.

It is crucial to end any lab activity with a recapitulation of open questions and intuitive findings because most of the work done during the lab might be lost or not appreciated at all.

During this activity, the teachers were students too, so the former could understand the latter during labs, because both were not given traditional lessons, but they were asked to actively take part to the project as if there was a film director that might intervene whenever they asked for help.

“Knowing mathematics for teaching demands a kind of depth and detail that goes well beyond what is needed to carry out the algorithm reliably. Further, it indicates that there are predictable and recurrent tasks that teachers face that are deeply entwined with mathematics and mathematical reasoning—figuring out where a student has gone wrong (error analysis), explaining the basis for an algorithm in words that children can understand and showing why it works (principled knowledge of algorithms and mathematical reasoning), and using mathematical representations.” (Ball 2005, 21).

We are convinced that the teachers taking part to this training experience had the possibility to meet this mathematics and to wonder about it.

At the end of last year, not only were most of the teachers willing to start a similar project next year, but some of them decided to be tutors, which shows that they really appreciated the activity we proposed and that they grew professionally and, from what they said, even personally (or at least their self-esteem did!).

## References

- Ball, D., H. Hill, and H. Bass. 2005. “Knowing mathematics for teaching: who knows mathematics well enough to teach third grade, and how can we decide?” *American Educator* 29 (1): 14-46.
- Barnes, D. 1989. *Active learning*. Leeds: University of Leeds TVEI Support Project.
- Bennett, R. 2011. “Formative assessment: a critical review.” *Assessment in Education: Principles, Policy and Practice* 18 (1): 5-25.
- Beyer, B. 1995. *Critical thinking*. Bloomington, IN: Phi Delta Kappa Educational Foundation.
- Deci, E., and R. Ryan. 1985. *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Dedò, M., and S. Di Sieno. 2013. “The mathematics laboratory: an outline of contents and methodologies”. *La Matematica nella Società e nella cultura. Rivista della Unione Matematica Italiana (I)* August: 321-342.
- Dochy, F., M. Segers, P. Van den Bossche, and D. Gijbels. 2003. “Effects of problem-based learning: a meta-analysis.” *Learning and Instruction* 13: 533-568.
- EACEA P9 Eurydice. 2011. *Mathematics in education in Europe: common challenges and national*

*policies*. Brussels: EACEA P9 Eurydice. [http://eacea.ec.europa.eu/education/eurydice/documents/thematic\\_reports/132EN.pdf](http://eacea.ec.europa.eu/education/eurydice/documents/thematic_reports/132EN.pdf)

European Commission, 2010. *Teachers' professional development - Europe in international comparison - an analysis of teachers' professional development based on the OECD's teaching and learning international survey (TALIS)*. Luxembourg: Office for Official Publications of the European Union.

Heidema, C. 2009. “Reading and writing to learn in mathematics: strategies to improve problem solving.” *Advanced Adolescent Literacy Instruction Together*, February. [http://ohiorc.org/orc\\_documents/ORC/Adlit/InPerspective/2009-02/in\\_perspective\\_2009-02.pdf](http://ohiorc.org/orc_documents/ORC/Adlit/InPerspective/2009-02/in_perspective_2009-02.pdf)

Hiebert, J., and D. Grouws. 2009. “Which teaching methods are most effective for maths?” *Better: Evidence-based Education*, 2(1), 10-11. <http://www.betterevidence.org/uk-edition/issue-2/which-teaching-methods-are-most-effective-for-maths/>

HM Inspectorate of Education. 2010. *Learning together: mathematics*. Scotland: Her Majesty's Inspectorate of Education (HMIE). <http://dera.ioe.ac.uk/995/1/ltn.pdf>

Kolb, D., and R. Fry. 1975. “Toward an applied theory of experiential learning.” In *Theories of Group Process* edited by C. Cooper, 33-53. London: John Wiley.

Kyriacou, C., and J. Issitt. 2008. *What characterises effective teacher-initiated pupil dialogue to promote conceptual understanding in mathematics lessons in England in key stages 2 and 3 (report no. 1604t)*. London: University of London, Institute of Education, Social Science Research Unit, EPPI-Centre. <http://eppi.ioe.ac.uk/cms/LinkClick.aspx?fileticket=cUpH12dN6Io%3d&tabid=2368&language=en-US>

Lord, P., and S. O'Donnell. 2005. *International review of curriculum and assessment frameworks. Thematic probe learner motivation 3-19: an international perspective*. National Foundation for Educational Research. <http://www.nfer.ac.uk/research/centre-for-information-and-reviews/inca/TP%20Learner%20motivation%203%20to%2019%202005.pdf>

Mueller, M., D. Yankelewitz, and C. Maher. 2011. “Sense making as motivation in doing mathematics: results from two studies.” *The Mathematics Educator* 20 (2): 33-43. [http://math.coe.uga.edu/tme/Issues/v20n2/v20n2\\_Mueller\\_Yankelewitz\\_Maher.pdf](http://math.coe.uga.edu/tme/Issues/v20n2/v20n2_Mueller_Yankelewitz_Maher.pdf)

Savery, J. 2006. “Overview of Problem-based Learning: definition and distinctions”. *Interdisciplinary Journal of Problem based learning* 1 (1): 9-20

Swan, M., P. Lacey, and S. Mann. 2008. *Mathematics matters: final report*. <https://www.ncetm.org.uk/public/files/309231/Mathematics+Matters+Final+Report.pdf>

[Back to contents](#)

## Motivations for choosing teaching as a career in biographical experiences of prospective teachers

*Wanda Drozka<sup>1</sup> & Joanna Madalinska-Michalak<sup>2</sup>*

*<sup>1</sup>The Jan Kochanowski University in Kielce, <sup>2</sup>University of Warsaw, Poland*

wanda.drozka@wp.eu & j.madalinska@uw.edu.pl

### Abstract

The purpose of this paper is to examine the motivation of prospective teachers for choosing teaching as a career and to critically consider the broader biographical and socio-cultural-economic context of their formation and development. Data were collected through a number of autobiographical stories written by a sample of prospective teachers among the postgraduate students from a university in Poland. Thematic analysis of motivation for choosing teaching as a career went together with the analysis of significant experiences of prospective teachers in their professional development journeys. The key findings suggest that even though the context of teaching has changed over the last 25 years in Poland, the crucial motives for choosing teaching as a career remain still the same: vocation, passion for working with children, possibility of self-realization, desire to work in a profession where there is some place for creativity, reflection and constructive criticism.

**Keywords:** career motivation; teaching as a career; prospective teachers; autobiographical studies; teacher education.

### Context of the research

According to the OECD's report "Teachers matter" (OECD 2005) that is about school teachers - their preparation, recruitment, work and careers - all countries are seeking to improve their schools in order to respond better to higher social and economic expectations. As the most significant and costly resource in schools, teachers are seen as a priority for public policy, and likely to become even more so in future years. Improving the quality of schools mainly depends on ensuring that competent people want to work as teachers and their teaching is of high quality.

The presented in this paper research on the motivation of prospective teachers for choosing teaching as a career was conducted in response to those tendencies that require educating and developing high quality teaching staff, equipped with advanced value system and their own beliefs, a wider social and cultural consciousness that encompasses also the context of their own occupation, staff that is aware of the necessity to learn, to refine, and to develop throughout their entire career (Caena 2011). The research is also the response to a visible deficiency in qualitative and autobiographical analyses and interpretations of experiences of prospective teachers, as well as of reflections of prospective teachers on their paths to teaching as a career.

### Research aims

The main aim of the presented research has been to gain knowledge about motivation of prospective teachers for choosing teaching as a career and to critically consider a broader biographical and socio-cultural-economic context of their formation and development. This endeavour to provide insights into prospective teachers' experiences and those factors which influence them can be very important in enriching the knowledge pertaining to teaching profession and professional development of teachers who become teachers in the contemporary conditions.

The research discussed in this paper has also a practical meaning, because conclusions drawn from it can help refine the quality of initial training for teacher candidates and improve development of programs pertaining to support of teachers in their further professional development on consecutive career stages.

## Theoretical framework

Motivation for choosing teaching as a career is considered an essential premise for motivation and enthusiasm in the teaching profession. Considering motivation for choosing teaching as a career by prospective teachers, one can state that this kind of motivation is an especially important factor not only in admission to, progression in and graduation from a teacher education programs (Blömeke et al. 2012), but also in explaining why teacher education graduates do not enter the profession or drop out after a short period of time (Rots et al. 2010; Thomson, Turner, and Nietfeld 2012; Watt and Richardson 2008).

In the contemporary conditions of teaching, especially in Europe (European Commission/EACEA/Eurydice 2013), this issue has gained importance because one can observe that it is becoming increasingly difficult to motivate young people for teaching profession as well as keeping trained workforce in the profession (Watt and Richardson 2007; Taylor 2006; Moran et al. 2001; European Commission/EACEA/Eurydice 2013). Students’ personal beliefs, preconceptions and reasons for choosing teaching as a career shape - as Watt et al. rightly pointed out (2007, 155) - their “aspirations for professional engagement and the trajectory of their career development”.

In the Polish context, studies on teacher career motivations have also gained momentum over the last two decades. Several studies have been conducted to understand profiles of Polish prospective teachers and their career motivation (Drozka 1997, 2008; Kwiatkowski 2012; Michalak 2007; Walczak 2012; Wilkomirska 2002). These studies on career motivation in teaching usually present similar results. The studies report that prospective teachers are primarily motivated by altruistic reasons and extrinsic motives such as getting a secure job and a steady monthly income in their career choice. Research studies on choosing teaching as a career in Poland are mainly quantitative ones. They usually lack theoretically defined constructs allowing development of rigorous measurement instruments to be applied in large-scale studies with representative samples.

## Research methodology

The presented research is based on the assumption that qualitative studies can be important in recognizing and interpreting the autobiographical experiences of prospective teachers on their way to the profession. It is assumed that the process of becoming a teacher is immersed in the whole teacher career. An important role in this process is played by experiences gained by a teacher from different fields and in different periods of their life (childhood, schooling, initial teacher education), and teachers’ views on themselves, as well as their relationships with others, workplace, students and teaching situations (Dróżka 1997, 2008; Michalak 2007). The research can be placed in the area of theories concerning continuous professional development of teachers (Day 1999) and theories of motivation in an attempt to identify the basis in a career selection process, especially expectancy-value theory that suggests that expectations of success and a subjective value of a task are major determinants of motivation for academic choices as well as career choices (Wigfield and Eccles 2000; Richardson and Watt 2005). The nature of teacher development is dynamic and situated.

In the broader research project from which this paper draws, research data were mainly collected through a number of autobiographical stories written by a sample of prospective teachers during academic year 2013/14 at Jan Kochanowski University in Kielce, Poland, at the Faculty of Education and Arts. The participants were selected on voluntarily basis from among postgraduate students who were just before graduating from their studies. The research participants studied the following specialization: early-school and preschool education with English language teaching.

The total of 65 prospective teachers took part in the study. The study participants are mainly women born in the years 1989-1990, so shortly after the political system transformation in Poland. Their childhood and schooling took place in the period when Poland as a country tried to build conditions for a new socio-political system - a neoliberal, democratic system. It certainly had an impact on the personal and professional identities of the participants, their lives and the conditions of their education and work. They enrolled in high schools in 2004: the year of Polish accession to

the European Union.

The research employed the method of free autobiographical statement: the research participants were asked to reflect on their experiences and write the story on the following theme “My way to a teaching profession: an autobiographical and socio-cultural context”. As a result, a volume of 65 texts from several standardized pages (5-6) up to a dozen pages (11-15) has been collected. The thematic analysis of motivation for choosing teaching as a career was accompanied by the analysis of significant experiences of prospective teachers along their paths of professional development.

## **Findings**

The analysis of the research results showed that it is difficult to determine unambiguously individual motives that prompted the prospective teachers to choose teaching as a career. The motives for selecting the profession often appear in clusters. The great majority of the researched prospective teachers does not give a single reason but rather entire sets of motives, among which one or two seem to be dominant. Below some of the recognized motives will be presented. A special attention will be paid only to these motives that were common for all researched teachers. Among the identified motives, the following ones repeated: (i) impact of family members and role models; (ii) notions of teacher’s work; (iii) desire to work in a creative profession which gives an opportunity to develop a teacher’s own as well as their pupils’ creativity; (iv) need for self-fulfilment and intellectual development, as well as for pursuing their own passions and interests; (v) job features and benefits.

### ***Impact of family members and role models***

On the basis of the analysis of the researched students’ statements, certain observations can be made pertaining to the nature of their childhood. To some extent they support regularities known from everyday observations, such as: young children like to play doctors and nurses, boys like to play firemen and policemen, girls like to play shop and school. To be a teacher was a dream for all the researched students. Frequently, those motives and aspirations were significantly reinforced by family traditions, and also by role models of teachers or homeroom teachers from their school years. In their recollections about favourite teachers and homeroom teachers, whom they admired and respected, who set an example for them, and whom they perceived as authorities, they most often mention such personality features, attitudes and behaviours as empathy, openness, sense of humor, being a good listener, patience, selflessness, fairness, impeccable manners, extensive knowledge, a way with children, gentleness, calmness, composure, etc.

Here are presented some characteristic citations:

“I imagined myself in a classroom full of children and I was their teacher. I kept class registers, pretended that I write on a blackboard, I gave tests and I graded them. I felt really well in that role. That is why I have always thought about the teaching profession. It was the most desired profession for me since childhood...”.

“I chose teaching as a profession, because I love children and working with them. When I was still a child I had an opportunity to play with and to look after younger children. I have always been good with children. I always knew how to organize plays for them that they really enjoyed. ...In my family the teaching profession is also quite popular.”.

“Especially fondly I recall my homeroom teacher from my secondary school. ...who in case of trouble always helped us, we were eager to turn to him, he was very understanding. It was plain that he cared about his wards. ...Even though we have finished the secondary school long ago, till this day we try to visit with him and stay in touch with him. He always had good advice to offer and was willing to help.”.

### ***Notions of teacher’s work***

An exceptionally important motive for many of the researched future teachers was their notion of teacher’s work from childhood supported by an image of a teacher or a homeroom teacher which was inculcated in them by parents and grandparents - who often were teachers, educators - which encompassed those values and attitudes that the researched students would like



to meet. Values, attitudes, and character features such as perseverance, ambition, richness of personality, vocation, activity, involvement, interests, passions, but also social prestige and respect, trust, sense of being needed are precious aspects of the profession which express its nature and uniqueness. They were inculcated in the young students as an image of a socially respected profession which ensures a meaningful position in the society. But so often, already influenced by their studies and professional practice, they turned out not to be consistent with the reality, which over the recent years underwent a radical transformation resulting from changing global and local conditions.

In many of the collected statements, especially in the parts describing and explaining the reasons for which the researched students decided to pursue educational studies and embark on a teaching career, there also appears a reflection on a social notion of this profession which now is present in the society. That notion started to take shape under the influence of market mentality and growing life hardships among many of the social strata. It shows the teaching profession as easy, not requiring higher education (effortless studies), simple, not taking up much time, encompassing the so-called frequent breaks and long vacations. Many entitlements that a teacher has are subject to critical social comments, which hold that in the market days these privileges are too extended and undue. Here are the examples of such statements:

“When we hear about the teaching work we think: a stress-free work for a few hours a day, two months of vacations, endless holidays. Over 50 days off during winter break and summer vacations, health leave, various allowances and a few hours of work - that is what a teacher’s situation looks like, as many people imagine.”

“Because of the privileges mentioned, this profession is constantly in the centre of attention and it is used as an example of undue entitlements. And what the real situation is like? I think that it is not all that easy. Often you have to work with rebellious students, you correct tests at night, and prepare yourself for the classes putting a lot of effort in it. The real thing is completely different after all.”

“The image of this profession created by the media is totally untrue (...).”

When comparing these remarks with the motivation for selection of studies and a choice of profession, it can be noticed that some of the researched future teachers, brought up in such a social attitude and atmosphere, succumbed to these stereotypes and decided to become teachers as if unconsciously. This can be proved by frequent statements that mention significant discrepancies, if not diametric differences, between the notions from before the studies and the knowledge about the nature of this profession that was acquired during the studies and their professional practice.

The belief that the teaching profession is easy and pleasant had to make place for the conviction - which grew stronger with knowledge gained during the studies and with professional practice - that this is a tough profession: demanding, requiring responsibility, stressful because of students’ and their parents’ bad behaviour, and sometimes due to the behaviour manifested by various groups that do not always show respect for teachers or endow this profession with prestige.

Here is a story that illustrates these tensions and contradictions in the way this profession is perceived:

“...Before I started studying I thought that working as a teacher is easy and very interesting. I thought that the teaching profession inspires a lot of respect both in children and their parents.”

“My notions on this subject changed when I was already studying ...First of all, I understood how extremely responsible is teacher’s work with young children. ...Nowadays, there are more and more aggressive students that teachers have a hard time dealing with. Contacts with child’s parents sometimes also turns out to be difficult. ...Today I am convinced that teaching work is quite stressful. ...It requires time and exceptional patience.”

And another statement of a similar character, the one like many others collected. Its author emphasizes that earlier she saw only good sides of the teaching profession: a lot of free time, breaks, vacations and all the holidays. Later, she started to notice also these less attractive sides of the profession, such as low social esteem, low teacher’s remuneration, which is inadequate when necessity of constant learning and growing demands are taken into consideration:

“First of all, I think here about the financial issue. Nowadays, the teaching profession is not so well paid. When you consider the enormous dedication and involvement on the part of teachers, they do not receive adequate remuneration. Especially fresh teachers earn very little money and have to work for their

promotions, which is not an easy task. There are not many workplaces, you can hear about teachers being dismissed all the time, because there is no money for them. I even encountered situations where some people work for an hour or two in a kindergarten without payment, because there is no money for a teacher of English for children. ...I think that my parents' opinion also in a way influenced my choice. In my parents' eyes the teaching profession is tied to prestige, a well-educated person who is an authority for others.”.

***The desire to work in a creative profession, which gives the opportunity to develop a person's own as well as the children's creativity***

The researched teachers are aware that the profession they have chosen is exceptional in its nature. It is, as they write, “a fascinating challenge”; it requires from people practicing it such things as an authentic involvement and passion, many outstanding personality features, character and attitude; charisma, empathy, communication skills and creativity are crucial. And here is another statement:

“The last aspect that I would like to mention in this part of my paper is my amazement with the fact how very creative a teacher must be. Sometimes literally out of nothing he/she needs to create something wonderful, and at the same time interesting for children. It is often the case that he/she prepares for the classes at home, spending long hours creating interesting teaching aids in the form of boards, games, posters, dolls, hand puppets, and great many other things. This requires from a teacher to be fully willing, open, and ready to invest enormous reserves of energy or ideas.”.

“He/she must be creative and patient. Other classes on the other hand require conscientiousness, accuracy and precision. Low remuneration requires humbleness. Teaching is a tough profession that requires from the person practicing it a lot of sacrifices and dedication. I appreciate and respect people who work as teachers, because without them the society would be uneducated and development on any given plane of life would not be possible.”.

Another prospective teacher wrote as follows:

“From the very beginning of my affair with school, what impressed me in the teaching profession, was its full creativity, i.e. building from start to end the educational world enclosed in one or several classrooms.”.

The researched people unanimously emphasize that not every person can work as a teacher, not everyone can be a teacher. This profession, as an exceptional occupation that influences the attitude to life, defines their life style, a kind of ethos - requires people gifted with vocation, passion, dedication and involvement; otherwise this would be a disaster for everyone, especially for the children.

***The need for self-fulfilment and intellectual development, as well as for pursuing one's own passions and interests***

Another no less important motive for choosing educational studies and teacher profession is the belief that this occupation presents wide opportunities for self-fulfillment and intellectual development throughout an entire career, as well as for realizing one's own passions and hobbies over their entire life. The meaning of the teaching profession as something that ensures opportunities to those young people, who want to develop, learn - is proved by a whole range of statements. This motivation is described by a student in the following way:

“Another important issue, in my opinion, is the lifelong learning that is required of the contemporary teachers. The world is changing at a rapid pace and things that are new and fresh today tomorrow can become history. For this reason permanent broadening and updating of knowledge is necessary. ...Such self-education though is not only connected with things that a teacher presents to children, but also with didactic means and with new technologies that he/she uses.”.

“Once upon a time, films were played to kids with the use of a video player and VHS tapes. The students today do not even know what those are, they never heard of them, because they live in a computer age, the age of new generation cell phones and tablets.”.

Here is another reflection, similar in nature:

“When choosing my specialization I took into consideration also the opportunity of further development. This profession requires a comprehensive and updated knowledge. ...And in the end, the argument that decided about my selecting the pedagogical studies was the idea of work with children itself. Many

people told me that I have in me something that makes me perfect for work with kids. ...Of course, the later professional practice and work in a kindergarten somewhat verified my take on the teaching profession.”.

### ***Job feature and benefits***

The prospective teachers indicated that part of the reasons for which they chose to teach is that teaching is a decent, stable profession with a rather low number of working hours (in Poland usually teachers teach for 18 hours per week) and long winter and summer vacations. The teachers seem to be fully aware that having such a job can give them some benefits like time for taking care of their own family. For example, one of the prospective teacher mentioned this in the following way.

“I think about being a teacher mainly because teaching in Poland is so stable. It gives me a chance of having more time for my own children. I will be able to be fully concentrated on them. My husband is busy most of the time. For sure, teaching would be good for me.”.

“I have a son and if I work as a teacher I will have more time for him, for example work at the office would have never given me such a chance. The school is a good choice.”.

“I think teaching is a right profession for me. Even though the salary is not high I can appreciate some job benefits. Mainly, I am looking for the vocations and short working hours.”

### ***Biographical ordeals and dilemmas on the way to selecting a major and teaching profession, and building professional and social awareness***

The analysis of collected materials not only revealed the motives of choosing teaching as a career, but at the same time allowed critical examination of the context in which the decisions crucial for the researched teachers were made. The interpretation of the context influences the process of becoming a teacher and making decisions about the profession results in the emergence of several common themes for all the collected stories. Among them are the following: (i) the clash of childhood and adolescence notions pertaining to the teaching occupation with the contemporary situation; (ii) a striking change in the general image of teachers and in their professional attitudes; (iii) mental clash caused by diminishing importance of higher education; (iv) shock resulting from confrontation with a job market; (v) the necessary change in notions pertaining to the selected profession, and the lack of acceptance of its common perception by the society; (vi) the notion of the profession inculcated in the students by their teacher families and its unjust, false social image; (vii) Bologna process as a difficult ordeal on the path to acquiring the profession. The length of this paper is very limited, therefore these themes will be presented only very briefly. Regarding the context of making a decision for being a teacher, an important observation should be mentioned: motives of the prospective teachers in many cases are of fluid nature, rarely they are “constans”; they are corrected depending on a changing external situation which influences capabilities and opportunities of individual people. Certainly, this can be connected to the ongoing processes of social and political transformations in Poland, the impact of shifting market rules, and to some extent to the characteristics of the contemporary culture such as changeability, uncertainty, impermanence, etc.

### ***The clash of childhood and adolescence notions pertaining to the teaching occupation with the contemporary situation***

The statements of the prospective teachers lead to the conclusion that the devaluation of the teaching profession as compared to their notions of that occupation from childhood and adolescence in the early 1990s, when teacher was still perceived in traditional categories of social and cultural role and this profession was still endowed with high prestige and respect, was a nasty experience for those researched prospective teachers. Later on, especially during the studies, they could critically observe the significant diminishing of social and cultural importance of this profession. The teaching occupation more and more started to be perceived in the categories of professional identity, narrow specialization, the so-called expertise without any strong social or cultural references, and the schools, education started to be seen in market and services categories.

Such a situation was complemented by simultaneous incommensurate raise in professional demands, complexity degree, and the responsibility of the occupation, as well as the necessity to take part in in-service trainings without adequate financial bonuses and concurrent drop in social prestige and trust. Here is an example of such a reflection:

“Third phenomena, unfortunately not necessarily a pleasant one, is a shift in the social status of the teaching profession. In the past a person teaching at school was someone important, respected, held in esteem by others. Students felt respect for them and it would be unthinkable to speak to such a person in an uncivil manner, or to act in a rude way towards them. Today this situation is completely different.”

### ***A striking change in the general image of teachers and in their professional attitudes***

Some important observations also pertain to another kind of transition apart from the one described in the statement. They concern the way how, during their education, the general image of teachers changed, their attitudes to the profession brought about by the social transformations and the reform of education. When they were still in a primary school, at the beginning of and up until the middle of the 1990s, their teachers and homeroom teachers were very devoted to their profession, their students and parents; they were involved in truly humanistic, person-oriented education that understood and supported comprehensive development of students. As years went by and future teachers were already in a secondary school or in a high school, their attitude and the way they approached their profession was more and more subjective and impersonal, often even cynical in their relations with students; they were no longer so empathic, rather they were bureaucratic and depersonalized. Here is a characteristic statement:

“I remember my homeroom teacher from my primary school. She used to do her job with passion. Well-being of a child was her priority, above anything else. You could go with any issue to her and she would always do her best to help, she strove to be like a mother to all of us: fair, caring, smiling and responsible for each and every one of us. That was the image of a teacher that I had. But with each level of education it was more and more difficult to encounter such an ideal teacher. Every successive one was different, had different priorities, had different principles and methods. It is sad but teachers like the one from primary school are more and more rare. ...Most of them simply performed the teaching profession sticking to certain procedures and models imposed by those higher up.”

### ***Mental clash caused by diminishing importance of higher education***

In the statements of the prospective teachers cited here a kind of mental clash is also visible; it reveals the snowballing increase in the number of university students in their generation (the 1990s) in Poland (also in private and non-public higher education institutions). This increase was especially noticeable at pedagogical and teaching studies, which were selected by persons who not necessarily were interested in the profession or studies themselves, but followed a “fashion” or the notion that it is right to study, or who needed higher education institution diplomas for numerous occupations, for which it was not required before Poland’s accession into the EU. Here is an example of such a reflection:

“This is very sad, because it shows that practically anyone can obtain higher education without much effort, and that the part of society, which is called the elite or the nation’s intelligentsia, is not it at all... Also the truth is that today any person can attend university and almost anyone can graduate from it. In the past, universities were attended only by brilliant people and only people like that graduated from them. And when I went to study, there was a hundred people in the first year, and with the exception of two or three they all graduated, because those three people resigned or changed their major. It is no wonder then that so many young teachers cannot find a job, if the whole multitude of people is accepted and practically none of them “fails”.”

### ***Shock resulting from confrontation with a job market***

Another ordeal, clash on the path of the future teachers to their professional identity, concerns the period of studies and search for a job in the acquired profession. They started to study in 2009, a year after the world financial crisis, which today in a particularly bitter way leaves a trace on this group - the graduates of higher education institutions - among others on teacher candidates. They find themselves on the brink of confrontation with a job market in an especially

unfavourable situation - there is a high unemployment rate and demographic low, teachers are fired and schools are being closed. They are also shocked by the situation they are witnesses to, in which, on the one hand, they graduate from their desired major that is their passion, on the other hand, they observe nepotism and difficulties connected to finding a job, employment encompassing remuneration in low hourly rates in private schools or kindergartens, or home schooling.

***The necessary change in notions pertaining to the selected profession; the lack of acceptance of its common perception by the society***

Other clashes, ordeals are no less interesting, e.g. from naive, idealistic, romantic, adolescent ideas about the profession as an easy one (teacher has a fine job), through the perception of this occupation as a synonym of “power” over pupils (an omnipotent guru), as having so much knowledge about the world, to the discovery during professional practice of difficulties connected to this profession, intensified by the reality of education itself and its environment, tough reality dampening the future teachers’ ardor already at the time of their trainings at university. The researched students, however, do not accept the stereotypical, common perception of this profession prevailing in the society, according to which this is a light, devoid of fatigue occupation acquired through easy, undemanding studies, ensuring nothing but privileges, and inspiring distrust in parents. Meanwhile, this is a profession, which in the opinion of the researched students is exceptionally tough and demanding, both in relation to high requirements pertaining to personality traits, predispositions, and to professional competences that constitute a serious challenge for the candidates for this occupation, which necessitates self-improvement and self-development.

***The notion of the profession inculcated in the students by their teacher families and its unjust, false social image***

In the life stories recorded by the researched students an interesting theme emerges: the impact that the fact of growing up in teacher families of long and rich pedagogical vocation traditions had on their awareness and the arising tensions and ordeals. The researched people emphasized the striking disproportions between the perception of this occupation in the society as easy and pleasant, or even as of little use, which to the students was false and unjust, and the image that they absorbed at home when being raised by a teacher family. The family in which, because of professional demands, difficulties, degree of social responsibility there was always not enough time for family and own children since work at school and other extracurricular activities connected to it took up all the private free time, required long preparation for classes, staying up at night to correct the tests, etc., lifelong learning, devoting all the weekends to vocational trainings and conferences, financing further post-graduate studies, constant coping with the growing demanding attitude and excessive ambitions of parents, results of inadequate upbringing of children in families, attacks on teachers often perceived as the main culprit for all the failures.

One of the researched students describes it in the following way in her statement:

“Teaching profession is very popular in my family. The range of topics my family teaches is very wide, starting from early-school education, through Polish language, to vocational teaching. So, my selection of studies, and at the same time of a profession, was dictated by family traditions. From the earliest childhood I was surrounded by topics pertaining to school, professional development studies, endless number of tests or students’ notebooks. My mother specializes in early-school education. She has worked for many years in one of smaller village schools.”.

***Bologna process as a difficult ordeal on the path to acquiring the profession***

For the researched students a kind of ordeal is experiencing the so-called Bologna process on their path to the teaching profession, which is criticized by them in a particularly bitter manner. In their educational and professional biographies that system caused them to take entrance exams for a particular major, namely: early-school and kindergarten education with English language, from which they graduated with a bachelor’s degree. Next, they started postgraduate studies with educational sciences as the major (all the previous specializations were combined into a single major - educational sciences), and after a year, on their final year of MA studies - they had to

choose a specialization. Such method of teacher education for them, and for the academic teachers, is inexplicable. It often causes the students' motivation to be shaken or weakened, or it even leads to the syndrome of the so-called professional burnout. Here is what one of the students has to say about it:

"When we started our supplementary MA studies, we were the first year that had to cope with the change in the system consisting in the fact that first year of BA and of MA studies was a general knowledge year. So, for three years of BA studies we were learning our major, and on the first year of MA studies all the specializations were combined into one - into educational sciences. This was not a good solution, because even though we did not have a lot of classes and we had quite a lot of free time, we did not have any methodology classes, no professional practice, and no English language in the first semester - and I was studying a major with that language. Such teaching system made us lazy and caused much of the knowledge acquired earlier to disappear somewhere. But the saddest fact is that we had nothing to do with the language that I have on my BA diploma in my specialization."

### **Conclusions and implications for teacher education**

The comparison of the findings presented in this paper with the research results on motives on choosing teaching as a career that are presented in the literature in Poland show that the motives for profession selection generally have not changed in the last 25 years in Poland (Rotkiewicz 1991; Drozka 1997; Kwiecinska 2000; Michalak 2007; Wilkomirska 2002; Drozka et al. 2012; Walczak 2012). Still the most dominant are the motives of internal nature, such as passion for work with children, vocation, interest in work at school. On further positions, but no less important, are motives connected to family traditions and the influence of the positive role models of teachers and homeroom teachers from earlier education, as well as the desire to work in a prestigious profession of high social importance. It should be noted that today when selecting an occupation its attributes are taken into account such as the opportunity for self-fulfilment, for constant intellectual development, auto-creation, creativity. This is perhaps connected to the emphasis put on the teacher's quality and his/her creativity, on lifelong learning in the European Commission's documentation. Prospective teachers still rely on common notions of this profession as an easy one, endowed with many privileges and ensuring work and employment - it is not favourable and in current situation it leads to many substantial disappointments.

A peculiar novum in this research is quite a large number of pragmatic motives connected to the studies' values, e.g. a pursuit for possible establishment of own educational or care and education institutions. Predominantly, these are the students' own motives; in the collected statements there were no motives connected to "coercion" - pressure on the part of the parents or of the economic and social situation, there was no context of social advancement through profession and higher education mentioned, which had occurred in previous generations. Today, studying is something obvious. However, some changes can be noticed in the researched statements: there is a different view of studying present - it is not only perceived as a path to employment, but first of all as a way to enrich their personality and as a peculiar cultural enhancement, in one word: education is appreciated as such. However, studies at university are often criticized for being too isolated from practical side of the profession, for predominance of traditional, inadequate in the context of contemporary challenges teaching methods, where emphasis is put on lectures and classes, and modern, active, and creative methods are neglected. Many critical remarks were also directed at the so called Bologna process - the opinions were that dividing pedagogical studies into BA studies and two-year MA studies in this profession is very unfavourable, mainly because of disrupted proportions between theory and practice (to the disadvantage of practice) and other inconveniences, e.g. additional discontinuity on the path to building a professional identity of a teacher.

From a higher education institution they expect gain more practical and professional learning outcomes in the form of competences they could use in their teaching profession, e.g. how to control negative emotions, how to solve particular problems, etc. Some of the students think about starting their own business, e.g. about establishing a private kindergarten. Many teacher candidates think about further post-graduate studies or another major, to postpone the time when they will be forced to find a job. All this causes strong complications in shaping a professional identity and

identification in current teacher candidates, the graduates of 2014, starting their activity on an educational job market.

In general, despite the observed cases of emotional dilemmas, lack of resolve concerning one's own professional path, struggle with reality and idealism, it can be said that the significant majority of the researched students presents pragmatic, professional and reflective orientation. In their statements, they clearly mention pursuit of high level of professionalism where teaching is concerned, the mastery of the field of their activity, and aspirations for a higher professional level of occupational awareness, a deeper critical sense of own identity, and a wider understanding of their social and educational roles in the contemporary conditions. They have quite high awareness of being forced to live and act professionally in the reality that creates tension between opportunity and risk, where a person needs to control external factors and contexts of his/her motives, intentions, decisions and actions. This is where their striving for lifelong learning, self-fulfilment in alternative forms, not only at school or in a kindergarten, stems from, where their appreciation for the creation of a habit of a constant professional development, and for making decisions that have a deeper meaning and give a sense of satisfaction takes its source.

Conducted analyses also lead to certain practical conclusions. Here are the more crucial ones:

- already in a high school, some kind of dependable, expert knowledge about the teacher and educator profession, about the culture of these occupations, their ethos and practice of these professions should be introduced in a specific form of professional pre-orientation;
- during the studies, already at the first year, an introduction into the reality of teaching as a profession should be done, which should be expanded on consecutive levels of studies: the master's degree and the doctoral degree;
- the studies programme should include more content representing economics and culture of the social and political transformations, and cultural period that we live in today. This would help the prospective teachers to deepen their awareness of the times and the world in which they live and work as teachers and as homeroom teachers. Thoughtfulness demanded today assumes critical knowledge of a person's self, his/her motives and desires in permanent confrontation with variable external, local, and global conditions.

The findings can be important in supporting the professional development of prospective and in-service teachers at all levels. The study can contribute to European educational research by researching the broader biographical and socio-cultural-economic context of Polish teachers' formation and development.

## References

- Blömeke, S., U. Suhl, G. Kaiser, and M. Döhrmann. 2012. "Family background, entry selectivity and opportunities to learn: what matters in primary teacher education? An international comparison of fifteen countries." *Teaching and Teacher Education* 28: 44–55.
- Caena, F. 2011. *Literature review. Teachers' core competences: requirements and development. Education and training 2020 thematic working group 'professional development of teachers'*. Brussels: European Commission.
- Day, C. 1999. *Developing teachers: the challenges of lifelong learning*. London: Falmer Press.
- Drozka, W. 1997. *Młode pokolenie nauczycieli. studium autobiografii młodych nauczycieli Polskich lat dziewięćdziesiątych*. Kielce: Wydawnictwo Naukowe Akademii Świętokrzyskiej.
- Drozka, W. 2008. *Generacja wielkiej zmiany. studium autobiografii średniego pokolenia nauczycieli Polskich*. Kielce: Wydawnictwo Naukowe UJK.
- Drozka, W., Miko-Giedyk J., and Miszczuk R. 2012. *Doskonalenie zawodowe nauczycieli i innych pracowników oświaty*. Kielce: Wydawnictwo Naukowe UJK.
- European Commission/EACEA/Eurydice. 2013. *Key data on teachers and school leaders in Europe. 2013 Edition. Eurydice Report*. Luxembourg: Publications Office of the European Union.

- Kwiatkowska, H. 2005. *Tozsamosc nauczycieli. Miedzy anomia a autonomia*. Gdansk: GWP.
- Kwiatkowski, S. 2012. “Choosing the teaching profession - research results.” In *Research, Policy, and Practice in Teacher Education in Europe* edited by J. Madalińska-Michalak, H. Niemi, and S. Chong, 141-162. Lodz: University of Lodz.
- Kwiecinska, R. 2000. *Rozum czy serce. Postawy wobec zawodu nauczycielskiego studentow uczelni pedagogicznej*. Cracow: Wydawnictwo Edukacyjne.
- Michalak, J. 2007. *Uwarunkowania sukcesow zawodowych nauczycieli. Studium przypadkow*. Lodz: University of Lodz.
- Moran, A., R. Kilpatrick, L. Abbott, J. Dallat, and B. McClune. 2001. “Training to teach: motivating factors and implications for recruitment.” *Evaluation and Research in Education* 15 (1): 17-32.
- OECD. 2005. *Teachers matter: attracting, developing and retaining effective teachers*. Paris: OECD publications. <http://www.oecd.org/edu/teacherpolicy>.
- Richardson, P., and H. Watt. 2005. “I’ve decided to become a teacher: influences on career change.” *Teaching and Teacher Education* 21: 475-489.
- Rots, I., A. Aelterman, G. Devos, and P. Vlerick. 2010. “Teacher education and the choice to enter the teaching profession: a prospective study.” *Teaching and Teacher Education* 26 (8): 1619–1629.
- Rotkiewicz, H. 1991. “Wybor zawodu nauczycielskiego”. In *Przemiany zawodu nauczycielskiego*, edited by Jolanta Nowak, Wroclaw–Warsaw–Cracow: Ossolineum, Wyd. PAN, PTP.
- Taylor, A. 2006. “Perceptions of prospective entrants to teacher education.” *Teaching and Teacher Education* 22 (4): 451-464.
- Thomson, M., J. Turner Jeannine, and J. Nietfeld. 2012. “A typological approach to investigate the teaching career decision: motivations and beliefs about teaching of prospective teacher candidates.” *Teaching and Teacher Education* 28 (3): 479–499.
- Walczak, D. 2012. *Początkujący nauczyciele. Raport z badania jakościowego*. Warsaw: IBE.
- Watt, H., and P. Richardson. 2008. “Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers.” *Learning and Instruction* 18 (5): 408–428.
- Watt, H., P. Richardson, and N. Tysvaer. 2007. “Profiles of beginning teachers’ professional engagement and career development aspirations”. In *Dimensions of professional learning: professionalism, practice and identity*, edited by A. Berry, A. Clemans and A. Kostogriz, 155-176. Rotterdam: Sense Publishers.
- Wigfield, A., and J. Eccles. 2000. “Expectancy-value theory of achievement motivation.” *Contemporary Educational Psychology* 25 (1): 68-81.
- Wilkomirska, A. 2002. *Zawodowe i społeczno-polityczne orientacje nauczycieli*. Warsaw: Instytut Spraw Publicznych.

[Back to contents](#)





## The involvement and responsibility of principals and mentors in induction programmes

*Nitza Schwabsky<sup>a</sup>, Orna Schatz Openheimer<sup>b</sup>, Judy Goldenberg<sup>c</sup> & Liat Basis<sup>d</sup>*

*<sup>a</sup>Gordon College of Education, <sup>b</sup>David Yalin College of Education, <sup>c</sup>Talpiot College of Education, <sup>d</sup>Independent researcher, Israel*

*nitzas@gordon.ac.il, schatz@macam.ac.il, judyg@zahav.net.il & liat@basisle.co.il*

### Abstract

The objective of the study presented in this article was to examine the involvement and the responsibility of principals and mentors in induction programmes. The research data was collected by two separate, on-line, anonymous, self-report survey questionnaires in a national distribution, which tested the attitudes of principals and mentors towards mentoring and the induction programmes. The study included 222 principals and 765 mentors. The findings indicate the similarities in principals' and the mentors' perceived involvement as well as differences in the responsibility attributed to them. It appears that there is a need for a further understanding of what entails principals' involvement, and a re-definition of the roles and responsibilities expected of principals and mentors in the induction programmes in Israel.

**Keywords:** induction; mentors; novice teachers; principals; responsibility.

### Context of research

The main goal of teacher education is to educate student teachers to become qualified and proficient teachers (Koster, Dengerink, Korthagen, and Lunenberg 2008). The final stage of the induction into teaching is characterized by the novice teacher's practical teaching experience at the school. Among the school functionaries who are involved in the induction and the preparation of the novice teacher to the profession, [hereafter: novice teacher(s) or novice(s)], the principal and the mentor are key figures, responsible for his or her success. Responsibility is defined as “being answerable to something within one's power” (Ben-Baruch and Shane 1982).

According to a Management Circular on the induction of new teachers (Ministry of Education 2009), the principal is expected to be responsible for the administration of organizational and pedagogical tasks in the induction programme in the school, and the mentor is expected to be a major pedagogical figure responsible for the professional-practical and personal support of the novice. They are both expected to be involved in the induction process in an active and supportive manner. Involvement refers to one's engagement in the programme. Work engagement is defined by vigour and dedication and refers to one's active involvement and feelings of pride at work (Van den Broeck, Vansteendiste, De Witte, and Lens 2008) in a positive and energetic manner.

### Research aims

We believe that the growing emphasis on the practical school-based experience of the novices' preparation, and the impact of neoliberal reforms in education systems that emphasize measures of accountability, should stimulate decision makers to evaluate and redefine the responsibilities of principals and mentors in the induction process. We consequently wished to explore how principals and mentors view their involvement and responsibility in the induction process. The article describes a part of a larger research study on the induction process in Israel. In the following section, we first review the central concepts of our theoretical framework, focusing primarily on the understanding of what responsibility is and what the roles of the school principal and the mentor are. Secondly, we review the context of the study, followed by the methodology, including participants and instruments. The findings are presented in two sections: The principals' involvement, the mentors' involvement, and their responsibility for fulfilling specific induction tasks. Finally, we present the conclusions, the discussion, and the implications, respectively.

## **Theoretical framework**

Responsibility is a choice and an obligation to one's own commitment. An educator, who takes responsibility for a given task, has made the choice and therefore has the obligation to act. Responsibility has clear consequences: To meet commitments, to keep promises and to fulfil obligations. Unlike accountability, which is a concept widely used nowadays, that refers to one's obligation towards an external power or authority, responsibility is a self-obligation to one's own commitment (Ben-Baruch and Shane 1982). One must do what he or she says and what one has committed to do!

Responsibility may be comprehensive or divided. According to the comprehensive approach, each of the functionaries, the principal or the mentor, is wholly responsible for the final outcome. However, this approach is ideal, and the more realistic approach calls for division of responsibility in two distinct ways: Either partial or segmented. In partial responsibility, the principal and the mentor each share the responsibility as a “contributory responsibility” (Inbar 1983, 68), and the extent of responsibility borne is proportional to the task at hand. By contrast, segmented responsibility refers to a full responsibility for segments of the result (ibid.).

Practically, responsibility cannot be delegated; it is the authority of the one in power that can be delegated. The one in authority hereby is the Ministry of Education that oversees the induction process, and has defined the roles of the principals and the mentors when supporting the novice. According to the Management Circular on the induction of new teachers (Ministry of Education 2009), the principal is responsible for the organizational tasks, and provides the conditions conducive to success, whereas responsibility for pedagogical tasks is shared. In some of these tasks, such as evaluation of the novice and conducting meetings, the principal and the mentor, each have full responsibility for the relevant share of the task and in others, such as pedagogical advice, responsibility is shared. Nevertheless, in all cases, the principal oversees the responsibility of all of the induction tasks at school.

### ***The school principal***

Imagine that you are a school principal, overseeing the induction programme. The success of the novice teacher, now teaching in your school, depends on your active involvement in the process, and on your positive attitudes towards induction (Wynn, Carboni, and Patall 2007). According to the literature, the principal bears responsibility for organizational-bureaucratic aspects of the job and resource assignment, as well as for the pedagogical-professional aspects of teaching and learning (Tschannen-Moran 2009). The principal combines the professional-academic nature with the professional-practical characteristics typical of the teaching profession (Schwabsky 2010). Practically, according to the Ministry of Education (2009), principals are expected to oversee the organizational and bureaucratic aspects of the induction, to build a supportive school mentoring culture, to demonstrate instructional leadership, to support the novices, to display understanding of their professional needs, and to be attentive to the novices' questions and problems. Principals who are involved actively in the induction are also expected to provide the conditions for its success by creating a protective atmosphere for the novice teachers, to verify the potential mentor-novice teachers' meetings, to present the novice with background data about the school, its vision and regulations, and to personally meet with, observe and form a feedback dialogue with the novice teacher and the mentor, and consequently, to perform formative and summative evaluation of the novice teacher's work.

### ***The mentor***

Now imagine that you are the novice teacher's mentor - a skilled and experienced teacher, who displays expertise in the relevant discipline (Hennissen et al. 2011). The novice teacher's success also depends on you - on your professional and personal support in “one-on-one” meetings with the novice. As the mentor, your commitment to the novice is imperative in improving his or her teaching skills and positively affecting their socialization in the school. Practically, according to the Ministry of education (2009) mentors are expected to assist the novice teachers in the

teaching-learning processes, to develop trust and nurture professional self-image, to familiarize the novice with the regulations and to facilitate their integration into the school culture. In addition, mentors are expected to perform student evaluations.

### ***Context: induction in Israel***

The objective of the induction process is to empower novice teachers and ensure their professional development, and to improve the mentor's role in the process (Schatz-Oppenheimer, Maskit, and Zilberstrom 2011). Over a seven-year period beginning in the 2000s, teacher induction programmes in Israel have undergone several transitions before taking shape in their present format, having transformed from an initial one-year programme to the present three-year induction and mentoring model.

Teacher training programmes last four years and the induction process takes place during the last year of study or when the novice teacher has completed 80% of the course of study. At this time the novice teacher assumes a full teaching load at the school, but yet, participates in learning sessions run by the training college and in review meetings in which the principal, the mentor and the field experience supervisor from the training college also participate.

The induction process constitutes a year of student teaching, in which novice teachers work in real conditions and receive their teaching licenses upon the successful completion of this year. The induction programme provides professional and emotional support (Nasser-Abu Ahija, Fresko, and Reichenberg 2011) and facilitates initiation into this complex profession (Grudnoff 2011). The Management Circular on the induction of new teachers (Ministry of Education 2009) provides a reference point for all who are involved in the training of new teachers in Israel, as it describes their role expectations. The functionaries involved are expected to be familiarized with the process, to follow the instructions and to fulfil the responsibilities involved in this position.

The question of individual responsibility in school has increasingly taken an important role (Inbar 1990) in the past two decades, as the basis of accountability measures. This article has consequently aimed to examine the principals' and mentors' perceived responsibility towards actual tasks of the induction process. Specifically, the article focuses on the following two questions: (1) To what extent are principals and mentors involved in the induction process? (2) Who is actually responsible for performing specific induction tasks? We asked the mentors and the principals to respond to questions and to rate their involvement and responsibility in the programme. We postulated that principals would claim an overall responsibility, whereas mentors would assume pedagogic and personal-professional task responsibility. In the next section we review the research methodology: participants and instruments, followed by the findings.

### **Research methodology**

This article is based on two separate, online, anonymous, nationwide research studies that provided a quantitative analysis of principals' and mentors' perceived responses.

#### ***Samples***

The principals' sample consisted of 222 participants who managed induction programmes up to the preceding three years. Among the principals, 75% had a graduate degree upon data collection; most had seniority in school administration ( $M = 9.78$ ;  $SD = 6.69$ ) and their average experience as principals of their current school is about eight years ( $M = 8.05$ ;  $SD = 6.0$ ).

The mentors' sample consisted of 765 participants, who engaged in mentoring during the preceding year of the data collection (2011). Among the participants, 58% had Bachelors' degree, 37%- Masters, and of the remaining 5%- 1% had a doctorate and 4% had a teaching certificate. Of the participants, 42% had more than 20 years of teaching experience ( $M = 18.4$ ;  $SD = 8.0$ ) at the time they filled out the questionnaire, and of the remaining mentors, the majority had 11 years of teaching experience. Until the data collection point of time they had mentored on average tree years ( $M = 3.4$ ;  $SD = 3.6$ ), and most mentors (67%) had mentored 2-3 novice teachers over the years ( $M$

= 3.5; SD = 3.4). In our analysis, we refer to the principals and the mentors as two distinct groups and as independent units of analysis.

### ***Instruments***

For the research, we used anonymous, online, self-reporting questionnaires composed especially for this study: One for principals whose schools conducted mentoring (40 questions) and the other for mentors (47 questions). Before composing the questionnaires, we conducted face to face interviews with seven principals and eight mentors. Interviewees were sampled according to district and school type. The present article is based on three sets of questions taken from these questionnaires. These questions presented a list of activities included in the induction process. The participants were asked to rate each activity on a Likert-type scale rating the principal's level of involvement in the activity, the mentor's level of involvement and who, in their opinion, is responsible for each activity.

### ***Data collection and data analysis procedures***

The questionnaires were distributed and collected electronically towards the end of the school year. Questionnaires were tested for face validity by fifteen researchers and distributed online to all of the principals in Israel via E-mail towards the end of the school year. Data analysis was performed using SPSS version 21. Frequencies and percentages, as well as chi-square analyses were used to compare between the principals' and the mentor's responses, where possible.

### **Findings**

The findings shed light on the involvement of the principals and the mentors in the induction process. The discussion of these results follows.

#### ***The principals' involvement***

We examined the principals' involvement in the induction process from the principals' and the mentors' points of view. We wished to know the extent of the principals' involvement, the extent of the principals' observations of the novice teachers, the extent the mentors believe that the principals are up to date on the induction process, and how pleased the mentors would be were the principal to become more involved in induction at school.

The principals' responses indicated that over 55% of them observe the novices twice or more in a semester.

#### ***The mentors' involvement***

To learn about the mentors' involvement in the induction of the novices, we measured the frequency of the mentors' interactions with the novices. Findings indicate that from the mentors' perspectives, the majority meet with the novices once a week (65%) or once every fortnight. We also measured the mentors' average scores regarding the degree of their affective, didactic and systemic involvement in the induction tasks (Figure 1).

The findings show that (a) of the three areas, mentors are primarily involved in supporting the novice teacher affectively. The novice teacher is at the centre of attention, and the topics included in this list provide emotional support, self and professional confidence, encouragement and supportive communication, supportive class climate and atmosphere. (b) The second in average of the mentors' tasks is the didactic support to the novice teacher. Didactic support refers primarily to content and instruction, and the pedagogic strategies for coping with the students' needs.

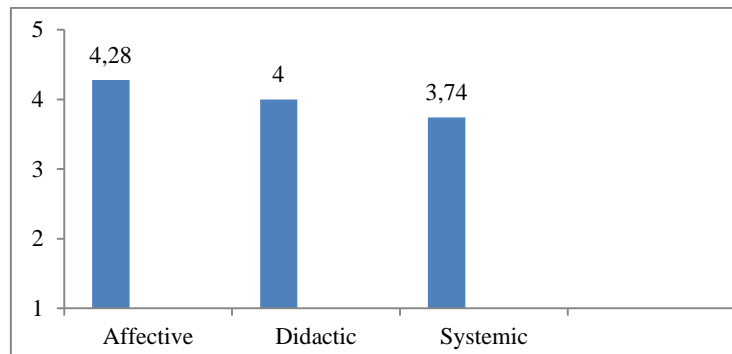


Figure 1. Mentors' involvement in the induction: average of involvement in each of the following areas on a Likert scale ranging from 1-5

Examples are: matching between instructional strategies and materials to the benefit of the students, and providing advice regarding instructional preparation. The organization of teaching is less apparent, such as students' assessment and time management. (c) Systemic support is the least apparent area of the mentor's involvement, and refers to dealing with issues pertaining to the school in general, such as class and school problem solving, exposure to regulations and norms, exposure to staff work, and contact with functionaries at the school. The findings show that the mentors' involvement focuses less on systemic issues than on the affection/emotional and the didactic issues of induction. The latter are at the core of instruction.

### ***Responsibility for performing specific induction tasks***

We measured principals' and mentors' attitudes towards different tasks performed during the induction process. We wished to examine to what extent the principals and the mentors ascribe responsibility for these tasks. The tasks selected derived from the Management Circular on the induction of new teachers (Ministry of Education 2009) and are ascribed to the principal. Examples of these tasks are: "Submits appropriate copy of employment terms to the novice teacher", "sends supervisor reports and details of personal conversation with the novice teacher and the intake procedure", "ensures that the novice teacher tours the school and meets its officials", "conducts personal meetings with the novice teacher to coordinate expectations".

A  $\chi^2$  test assessing the differences between principals and mentors indicated a significant statistical difference between principals and mentors concerning their respective responsibilities for performing the induction tasks ( $\chi^2$  (2,613),  $p < .000$ -  $p < .008$ ). Findings show that whereas the mentors accorded principals the sole responsibility for all of the formal issues, such as, involvement in reporting to the Ministry of Education and defining the novice's job, the emotional and personal guidance to the novice teacher was the only task for which mentors accepted exclusive responsibility. By contrast, the principals avoided assuming (full) responsibility for the tasks, and claimed that the responsibility for all of them is collaborative.

Teacher education has undergone transitions from theoretical to a more experiential approach (Koster et al. 2008), manifested in a practical year of full teaching at the schools. In addition, following neoliberal reforms, educators have been expected, more than ever before, to be accountable for their work. With this in mind, we will discuss the principals' and mentors' involvement in the induction, and their perceived responsibility in the programme.

### ***Principals' and mentors' involvement***

Earlier studies have indicated the importance of the principals' and the mentors' involvement in the induction, and support to the novice teachers (Cunningham 2007; Hobson et al. 2009; Wood 2005). Additional research in the field has emphasized the crucial role of the principal as an educational leader who affects the novice teachers' success (Wynn, Carboni, and Patall 2007). Principals and mentors see eye to eye as to their involvement in the programme, measured by being up to date with the programme and their rate of lesson observations. It appears that based on their

responses, both principals and mentors are involved adequately according to the required by the Ministry of Education. Yet, whereas a third of the mentors would have liked principals to be more involved, a third would have preferred that they wouldn't.

These results regarding the principals' involvement coincide with the literature that indicates that the principals' leadership may affect the teachers' success (Roberson and Roberson 2009). The mentors' areas of involvement also coincide with literature that shows that mentors primarily support the novice teachers emotionally and didactically (Hennissen et al. 2011).

### ***Principals' and mentors' responsibility***

Regarding responsibility, the literature has indicated that there are a few types of responsibility such as, comprehensive or partial, divided or segmented (Inbar 1983). The findings presented in this article showed the principals' and mentors' different views of responsibility. The findings yield several observations about the principals' views of shared responsibility, and their potential reluctance to accept a sole responsibility for tasks assigned to them: First, it is possible that the principals lack awareness of their responsibility towards tasks solely ascribed to them, because they perceive the novices' professional status as that of a trainee still being educated at the college, rather than as a mature teacher who is part of the school teaching staff for which the principal is responsible. Second, it is possible that principals feel job overload, and perceive the induction programme as one of many that require their attention and not as a programme deserving special consideration, and therefore prefer to interpret their tasks in the induction as shared with the mentors. Third, it is possible that principals report collaborative responsibility with the mentors rather than their sole responsibility to the tasks because they think that this is what is expected of them as democratic and collaborative educational leaders.

### **Conclusions and implications for teacher education**

This article focused on the following two questions: (1) To what extent are principals and mentors involved in the induction process? (2) Who is actually responsible for performing specific induction tasks? The findings of this article are rooted in two separate studies, and we ought to be careful when drawing general conclusions. With this in mind, we'll first present our main conclusions, formulate topics for further discussion, and finally, discuss the relevance of the study.

Our study shows that given principals' and mentors' reports, it is apparent that the principals are involved in the induction to a reasonable extent, and that only a third of the mentors would have liked the principals to be more involved, compared with a third that would prefer they would not. Among the mentors, the majority are involved with the novices on a weekly basis, and primarily provide emotional support to the novice teacher. Regarding their responsibility towards tasks in the induction, a significant difference was found between the principals and the mentors, except for interpersonal tasks that were assumed to be the mentor's tasks. The findings show no consensus between the principals and the mentors, and whereas the mentors ascribe most of the administrative tasks to the principals, the principals claim that the responsibility for performing most of the tasks is shared by the mentors and the principals.

The findings regarding the principals' and the mentors' involvement in the induction programme and the differences between their perceived responsibility for tasks have far-reaching implications that are liable to exert adverse effects on the induction process and the entire educational system, and must call for the decision makers' attention: (a) Principals should be aware of the benefits of their active involvement in the induction, especially with regard to successful integration of novice teachers and their decision to remain within the educational system. (b) The boundaries of principals' and mentors' responsibility should be reconsidered, redefined and communicated out loud so that all of those involved will be aware of and familiar with these boundaries in benefit of the successful induction. The partial as well as the shared parts of responsibility should be agreed upon and spelled out, and thus performed.

We recommend that policymakers encourage principals to be more involved pedagogically and support the novice teachers at their schools. We also recommend that principals and mentors

are informed of the differences in their perceptions, with emphasis on the possible reasons for such variation. Furthermore, we recommend that future research examines the rates of principals' involvement in the induction process, such as ranging from the principal's swinging by and asking the novice teacher how he or she has been to the principal's practical pedagogical support and advice to the novice teacher. We also recommend that future research is aimed to define the tasks, which ought to be exclusively the principal's responsibility and which tasks should be shared with the mentors. Practically, we recommend that the functionaries' tasks and responsibilities in the induction be examined and clarified. Finally, due to the importance of the induction programme to the novice teacher, to the school and to the entire education system, and the need to retain excellent teachers in the education system, it is recommended to emphasize the importance of the induction programme to school principals and to the entire staff, so that they devote a considerable amount of time and effort to help the novice teacher succeed.

### Acknowledgements

This work was supported by the Israel Ministry of Education's Teacher Induction Division and the MOFET Institute. We express our sincerest gratitude to the Ministry's Teacher Induction Division Director, Dr. Sara Zilberstrom and the MOFET Institute Head, Dr. Michal Golan for their cooperation and support of the research studies on which this article is based.

### References

- Ben-Baruch, E., and P. Shane. 1982. "Autonomy, and the delegation of authority." In *Educational administration and policy making: the case of Israel*, edited by E. Ben-Baruch, and Y. Neumann, 71-84. Herzliya: Ben-Gurion and Unipress.
- Cunningham, B. 2007. "All the right features: towards an "architecture" for mentoring trainee teachers in UK further education colleges." *Journal of Education for Teaching* 33 (1): 83-97.
- Hennissen, P., F. Crasborn, N. Brouwer, F. Korthagen, and T. Bergen. 2011. "Clarifying pre-service teacher perceptions of mentor teachers' developing use of mentoring skills." *Teaching and Teacher Education* 27: 1049-1058.
- Hobson, A. J., P. Ashby, A. Malderez, and P. D. Tomlinson. 2009. "Mentoring beginning teachers: what we know and what we don't." *Teaching and Teacher Education* (25): 207-216.
- Grudnoff, L. 2011. "Rethinking the practicum: limitations and possibilities." *Asia-Pacific Journal of Teacher Education* 39 (3): 223-234.
- Inbar, D. 1983. *Responsibility*. Bnei-Brak: Hapoalim, HaKibutz Hameuhad Press.
- Inbar, D. 1990. "The organizational boundaries of responsibility: an ethical challenge" *Journal of Educational Administration* 28 (1): 24-37. <http://dx.doi.org/10.1108/09578239010136466>
- Koster, B., J. Dengerink, F. Korthagen, and M. Lunenberg. 2008. "Teacher educators working on their own professional development: goals, activities and outcomes of a project for the professional development of teacher educators." *Teachers and Teaching: Theory and Practice* 14 (5-6): 567-587.
- Ministry of Education 2009. "Integrating interns and new educational employees at schools." Director-General's Circular, Permanent Regulations 2010/1(B).
- Nasser-Abu Alhija, F., and B. Fresko. 2010. "Socialization of new teachers: Does induction matter?" *Teaching and Teacher Education* 26: 1592-1597.
- Roberson, S., and R. Roberson. 2009. "The role and practice of the principal in developing novice first-year teachers." *Clearing House* 82 (3), 113-118.
- Schatz-Oppenheimer, O., D. Maskit, S. Zilbershtrum. 2011. *To be a teacher - on the entrance path to teaching*. Tel Aviv: Mofet Institute.
- Schwabsky, N. 2010. "Opinions and forecasts for change in teacher training: opportunities and risks". *Dapim* 50: 17-47.



- Tschannen-Moran, M. 2009. “Fostering teacher professionalism in schools: the role of leadership orientation and trust.” *Educational Administration Quarterly* 45 (2): 217-247.
- Van den Broeck, A., M. Vansteendiste, H. De Witte, and H. Lens. 2008. “Explaining the relationships between job characteristics, burnout and engagement: the role of basic psychological need satisfaction.” *Work & Stress* 22 (3): 277-294.
- Wood, A. 2005. “The importance of principals: site administrators’ roles in novice teacher induction.” *American Secondary Education* 33 (2): 39-62.
- Wood, A., and R. Stanulis. 2009. “Quality teacher induction: fourth-wave (1997-2006) induction programmes.” *The New Educator* 5: 1-23.
- Wynn, S., L. Carboni, and E. Patal. 2007. “Beginning teachers’ perceptions of mentoring, climate, and leadership: promoting retention through a learning communities perspective.” *Leadership & Policy in Schools* 6 (3): 209-229.

[Back to contents](#)

## **Pre-service teachers’ perceptions of the support, challenges and opportunities associated with teaching out-of-field**

*Linda Hobbs & Coral Campbell*

*Deakin University, Australia*

l.hobbs@deakin.edu.au & coral.campbell@deakin.edu.au

### **Abstract**

While pre-service teacher (PST) education programs prepare teachers for certain specialisations, the reality is that many secondary teachers will be expected to teach out-of-field, especially in Australia. Do universities have a role to play in preparing teachers for out-of-field teaching? At the very least, they should aim to produce adaptable, well-informed, capable teachers. This project uses case study methodology to examine teacher educator and PST perceptions relating to the role that universities play in preparing teachers for a reality that is likely to include out-of-field teaching. This paper focuses on PST perceptions of the associated expected support, challenges and opportunities. A small PST survey sample and PST interviews have shown that there is general positivity towards this practice, around the opportunities that can emerge, and an expectation of support accessibility; but diversity surrounds the challenges, suggesting a variation in respondents’ capacity to cope with the challenges that might emerge. Implications for teacher education are discussed.

**Keywords:** teaching out-of-field; teacher education; pre-service teacher perceptions; teacher readiness.

### **Context of the research**

Pre-service teachers (PSTs) undertake studies to prepare them for teaching certain subjects. However, the reality is that many early career teachers are expected to teach subjects they are not qualified to teach, that is, teach out-of-field (Ingersoll 1999). Alarming, the national 2010 Staff in Australia’s Schools Survey (cited in Auditor General 2012) showed that unfilled science and mathematics positions were mostly filled by out-of-field teachers: 42% from current staff, and 23% from recruited teachers who were not qualified to teach the subject. Internationally, this phenomenon is documented in such countries as Australia, Germany, South Africa, Ireland, United Kingdom, and the United States (Bosse and Törner 2013; Crisan and Rodd 2011; Steyn and du Plessis 2007; Ingersoll 2005; Ríordáin and Hannigan 2009). The European Commission (2011) highlighted that “the quality of teaching is the single most important within-school factor affecting student attainment”. This quality is potentially compromised when underqualified teachers are at the helm. Teacher education programs are not required to prepare teachers to teach out-of-field; however, they do have the challenge of preparing adaptable, well-informed, capable teachers. In Australia, Marginson, Tytler, Freeman and Roberts (2013), in a comparative study of 26 countries, emphasized the scale of the issue for Australia more so than comparable countries, and the need for urgent action.

Early career teachers often have had minimal opportunity to develop strategies, knowledge, skills or attitudes that will enable them to cope with many of the realities and complexities of teaching, but particularly with the challenge of having to teach out-of-field. The structures and philosophical underpinnings of a program directly influence an early career teacher’s readiness to tackle the expected and unexpected. The degree to which teacher education programs equip PSTs for the realities of teaching is constantly under review (see, for example, DEST 2003; Dyson, 2005; House of Representatives Standing Committee on Education and Vocational Training 2007).

### **Research aims**

This pilot project, undertaken with PSTs and relating to their university courses, aims to generate important insights into the interplay between discipline-based and general knowledge,

skills and attitudes in shaping teacher readiness and identity. The project examines the curriculum of secondary teacher education programs, and explores perceptions of teacher educators and PSTs in their final year. The focus is on remote, rural and regional teacher education programs across the Australian states of Victoria and NSW due to the reported higher unmet demand for science teachers in non-metropolitan areas (Lyons et al. 2006). The project uses case study methodology (Stake 2005) informed by a sociocultural lens using the boundary-crossing literature (Akkerman and Bakker 2006) to respond to two research questions (RQ):

- RQ1 How do the structure and content of secondary pre-service teacher education programs in non-metropolitan areas support the development of teacher-ready, adaptable teachers?
- RQ2 How do pre-service teachers respond to the potential challenge of teaching out-of-field?

This paper focuses on data from the student survey and student interviews to focus on the second question, specifically reporting on the expectations for supports, opportunities and challenges in relation to out-of-field teaching.

### **Theoretical framework**

The Boundary Between Fields model (Hobbs 2013) describes a range of factors that determine where discontinuities may arise for a teacher, which results in them feeling “out-of-field”: Personal Resources, Contextual Factors, and Support Mechanisms. This model is used in the project as the basis for developing an on-line survey and interview schedules. Personal Resources refer to teachers’ adaptive expertise, knowledge, and commitment. How teacher educators and PSTs view the personal resources required to transition into teaching is a significant focus of the survey and interviews. Teachers draw on a broad range of knowledge. PSTs generate knowledge through their teacher education experiences, both through coursework and their professional placements. The notion of teacher commitment has been explored in Hobbs’ prior research on teacher passion and imperatives driving practice (Darby 2009), where commitment is conceptualised as two imperatives driving practice: a commitment to their students, and a commitment to the subject due to their personal interest in it. Contextual Factors refer to factors that situate systems, practice and people into the broader landscape. Generally it can include geographical region, systemic structures (institutional, political), and socio-economic status that influence the delivery. The following contextual elements are explored: the general teacher education context (systemic change, regulatory regimes), and the program as the context of PSTs (how the need to adapt to different fields is situated within the program structure, such as through university based experiences, partnership arrangements, school practicum and school contexts). Support Mechanisms are “boundary objects” that act as bridges between in-field and out-of-field spaces. Star (1989) describes boundary objects as “bridges” or “anchors” between “intersecting social worlds”. Objects can be human or non-human, and come in the form of artefacts (tools), discourses (as a common language), or processes that allow coordination of actions (Wenger 1998). Boundary objects are central to professional identity development because they improve the likelihood of learning through the boundary crossing event.

### ***Adaptable teachers***

Teaching requires adaptability, but the task of out-of-field teaching adds another layer to the requirement to be adaptable. Out-of-field teachers can display adaptive expertise when they apply knowledge effectively to novel problems or atypical cases in a domain (Holyoak 1991). Adaptive expertise is exhibited when a teacher balances innovation (required when moving into a new area) with efficiency (arises out of familiarity with the content, processes and pedagogy). Placing teachers who are efficient in their specialist areas into an unfamiliar specialisation can render them inefficient. Embracing and learning through innovation can lead to new efficiencies. Some teachers, however, are less willing to embrace the uncertainties of innovation, they may develop

efficiencies without seeing an out-of-field area as opportunities for innovation, while others regrettably lack the time and support needed to develop new efficiencies based on good teaching practices. How willing they are to be adaptable in the face of out-of-field teaching is illustrated through Hobbs’ (2012) Adaptability Scale:

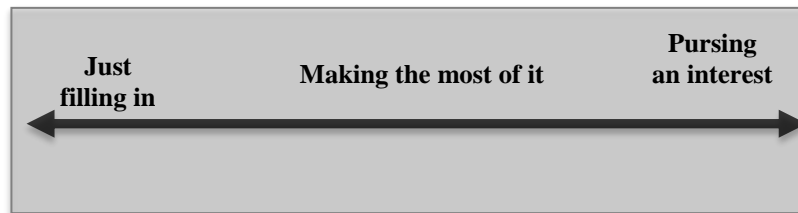


Figure 1. Adaptability scale (from Hobbs 2012)

This scale is used in this paper to help analyse the positioning of pre-service teachers in relation to teaching an out-of-field subject as they reflect on their expectations.

### Research methodology

The research design incorporates quantitative online survey methods and qualitative interviews with teacher educators and PSTs to inform development of a multiple case study (Stake 2005). Case study enables a focus on a case, which in this project will be the teacher education program (case programs). Field research, through the collection of artefacts (documents, guides, websites) and interviews with the PSTs and teacher educators, provides rich descriptions to inform case development. An on-line PST survey provides broad canvassing of the issues facing PSTs and universities and thus enables generalisation beyond the cases. Survey data also informs case development. Multiple methods provide the opportunity for triangulation between multiple data sets, clarifying meanings generated by the research, and verifying repeatability of the research. In addition, the student survey and interview data provide baseline data for the forthcoming longitudinal study examining transition into the profession. Each case will describe the contextual factors, support needs, and personal resources relating to the case program. While each teacher education program is a bound case, a cross case analysis generates themes relating to the broader issue of the role of secondary teacher education in preparing adaptable and flexible teachers.

### *Pre-service teacher Survey*

An online survey (developed and trialled in 2012, see Hobbs, Campbell, Herbert and Cole 2012) was administered to all PSTs in their final year of secondary teacher education programs in non-metropolitan universities across NSW and Victoria (n=31 programs: 12 in New South Wales, 19 in Victoria). The survey allowed participants to identify factors that would make them feel out-of-field and the potential impact of those factors on teacher efficacy, and support mechanisms they expect to need and how they expect to access them. The survey consisted of Likert scale or multiple choice items, and some open response items. The survey generated baseline data and obtained broad scale perspectives from PSTs in relation to: expectations for their career in terms of supports and challenges, an accounting of their personal resources, and disadvantages and opportunities perceived to be associated with teaching in-field and out-of-field.

The survey focused on (responses to the bolded themes are analysed for this paper): Job climate; Adaptability needs; Out-of-field expectations: subjects, commitment, challenges, opportunities, ITE, learning needed, supports.

Below are the sub-items for questions relating to the bolded themes (see above). These sub-items draw from data from the project reported in Hobbs (2012) and Hobbs et al. (2012):

#### *Support related questions (expected accessibility and usefulness)*

Support is central to a teachers’ successful transition into out-of-field teaching (Hobbs 2013;

du Plessis, Carroll, and Gillies 2014). Are students aware of the supports that might be available and useful? This question was intended to both establish their current awareness and awareness raising of the supports that may be useful for them:

- curriculum or syllabus documents;
- repositories of activities and resources;
- formal mentoring/coaching programs;
- reduction in workload;
- inter-school collaboration programs;
- in-house professional learning, e.g., professional learning teams;
- external professional learning;
- informal coaching, mentoring, informal advice from other teachers;
- networks outside school, e.g., family, teachers from other schools, peers from teacher education, community/industry;
- formal educational theories;
- subject department activities, e.g., meetings;
- further formal study;
- learning from my undergraduate degree;
- principal;
- university lecturers;
- university peers.

*Opportunities (expectation of experience and impact on confidence and competence)*

Out-of-field teaching is often seen from a deficit position because of the importance of qualifications and background in a discipline in contributing to teacher content knowledge. While this content knowledge is fundamental to good teaching, prior research also recognizes some benefits and opportunities associated with teaching something new and not being restricted to their qualified areas for their entire teaching career (Hobbs 2013). Are pre-service teachers aware of the opportunities relating to:

- more experience to boost CV;
- new challenges and possibilities;
- opportunity to gain an appreciation for how students behave and learn in different subjects;
- opportunity to develop different strategies for working with students;
- adds another dimension to my relationship with students;
- provides an appreciation for what other teachers do;
- improved ability to make links between different subjects;
- exposes me to new pedagogies that might be translated into my in-field subjects.

*Challenges (expectation of experience and impact on confidence and competence)*

There are obvious issues associated with out-of-field teaching. Rather than posed as problems that might be insurmountable, and which emphasise the deficit position on out-of-field teaching, these issues are posed as challenges:

- presentation of content that is disconnected, or unrelated to student interests or life worlds, due to not understanding applications;
- use of traditional pedagogies that might be considered less effective;
- negative impact on student learning;
- lack of both a personal commitment to the subject and enthusiasm and interest in what i am

- teaching;
- less commitment to self-improvement;
- less commitment to participating in innovation;
- less commitment to participating in subject-related discussions;
- reliance on support from elsewhere;
- negative teaching experiences.

A total of 31 PSTs completed the survey, which was 4% (n=10) of the case program student population and 1% (n=21) of the non-case program student population. While the number of respondents was small, there was some indicative data gained.

### ***Pre-service teacher interviews***

Pre-service teachers in their final year of their degree, with any subject specialization, were invited to participate in a 30-minute phone interview. While the survey gained general knowledge about expectations, the PST interviews enabled a sharing of stories and probing of issues not achievable through an individual survey. Six PSTs participated, one retracted their data for professional reasons. In this paper, the data for two students were selected to illustrate differing positions along the Hobbs Adaptability Scale.

### ***Analysis, interpretation, and theory-building***

Analysis of quantitative data employs simple frequency tables or cross-tabulation tables for displaying patterns and trends (Opportunities and Challenges questions). Responses to questions about the expected accessibility and usefulness of support mechanisms could be used to calculate: highest usefulness/lowest accessibility, lowest usefulness/highest accessibility. The analysis of interview data involved a categorical analysis, with the categories of support, challenges and opportunities being focused on in this paper.

### **Findings**

The survey was undertaken by 31 participants from universities in Victoria and New South Wales. While this number is small, some worthwhile data has been generated to provide indicative data on pre-service teachers' awareness of and attitudes towards out-of-field teaching. Each of the items uses a Likert scale of 4 or 5, with qualitative labels rather than numbers representing each point on the scale, with the highest number meaning “High” in every question. The graphs below provide percentages for each corresponding point in the scale.

### ***Opportunities***

Overall, students displayed relatively positive attitudes towards the opportunities that teaching out-of-field might accord, with 2 or fewer of the respondents indicating that each of the opportunities would not be experienced as an opportunity. See Figure 2.

The items with the most positive responses were opportunities to make links between subjects (mean 4.33), exposure to new subject pedagogies that can be translated to in-field subject (4.21) and an appreciation of how students learn in other subject areas (4.21).

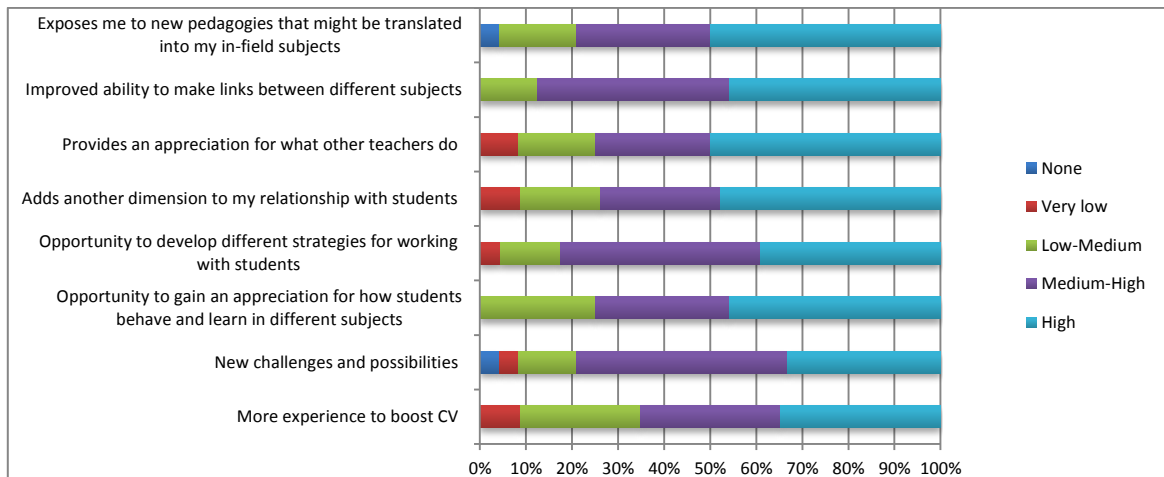


Figure 2. Opportunities: Impact on confidence and competence

### Challenges

In terms of challenges, the scores were lower than the opportunities, suggesting that fewer items were seen as challenges that could negatively impact their confidence and competence. See Figure 3.

The items least acknowledged as a challenge were “less commitment to participating in innovation”, “less commitment to self-improvement”, and “less commitment to participating in subject-related discussions”. This suggests that the pre-service teachers surveyed are more likely to remain committed to teaching regardless of being out-of-field or not. According to a threshold analysis, “traditional pedagogies that might be considered less effective” was the easiest of the challenges for respondents to endorse. However, while more saw that traditional pedagogies might be relied on, fewer saw this as having a high impact on their confidence and competence. Twenty-one respondents saw that reliance on support from elsewhere presents as a challenge, suggesting a desire to be independent, perhaps an unrealistic expectation for an early career teacher.

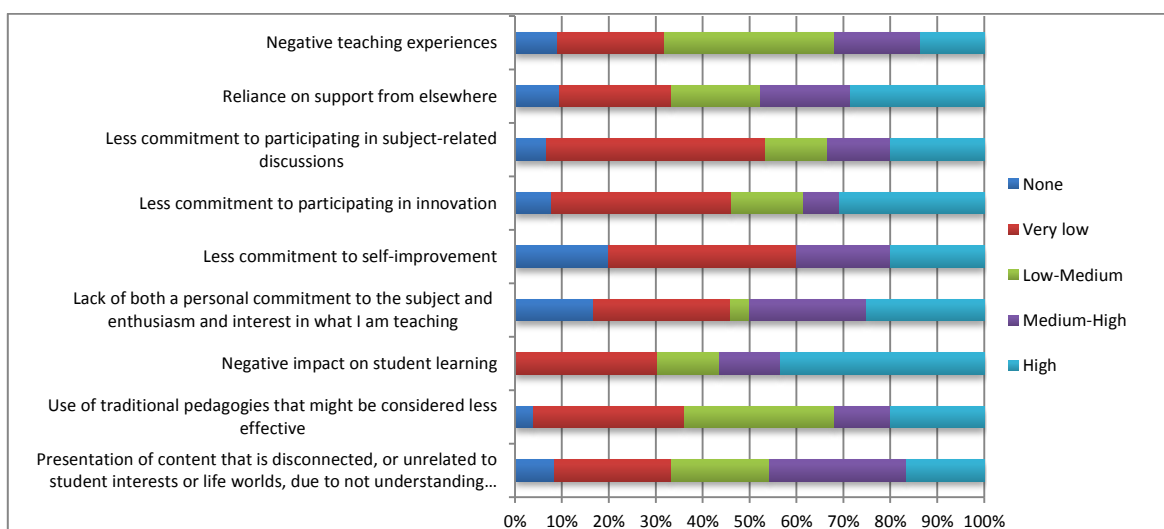


Figure 3. Challenges: Impact on confidence and competence

### Expected accessibility and usefulness of support mechanisms

Support-related questions focused on the expected access and expected impact on confidence and competence of certain supports.

The supports expected by the PSTs are listed in Figure 4. Figure 5 shows the expected impact on confidence and competence.

A high degree of access is expected for the following items: “informal coaching”, “formal mentoring”, “repositories of activities and resources”, and “curriculum and syllabus documents”. The least expected support was “reduction in workload”, which is surprising given that both Victoria and New South Wales have provision in their policies for beginning teachers to have a reduced workload. Further “formal study” had the highest percentage of “low” access.

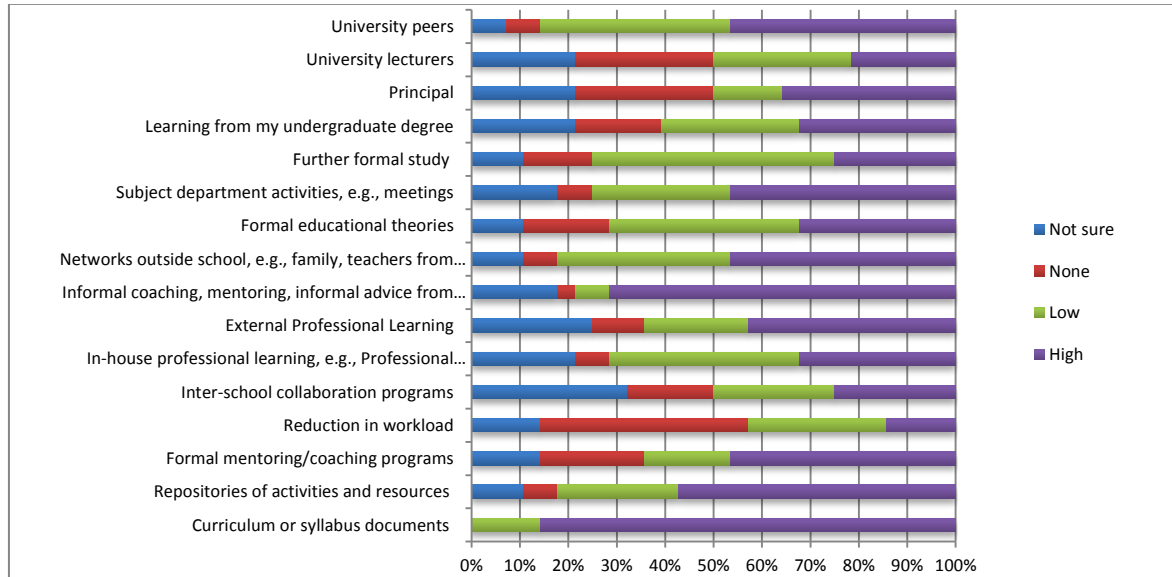


Figure 4. Supports: expected access

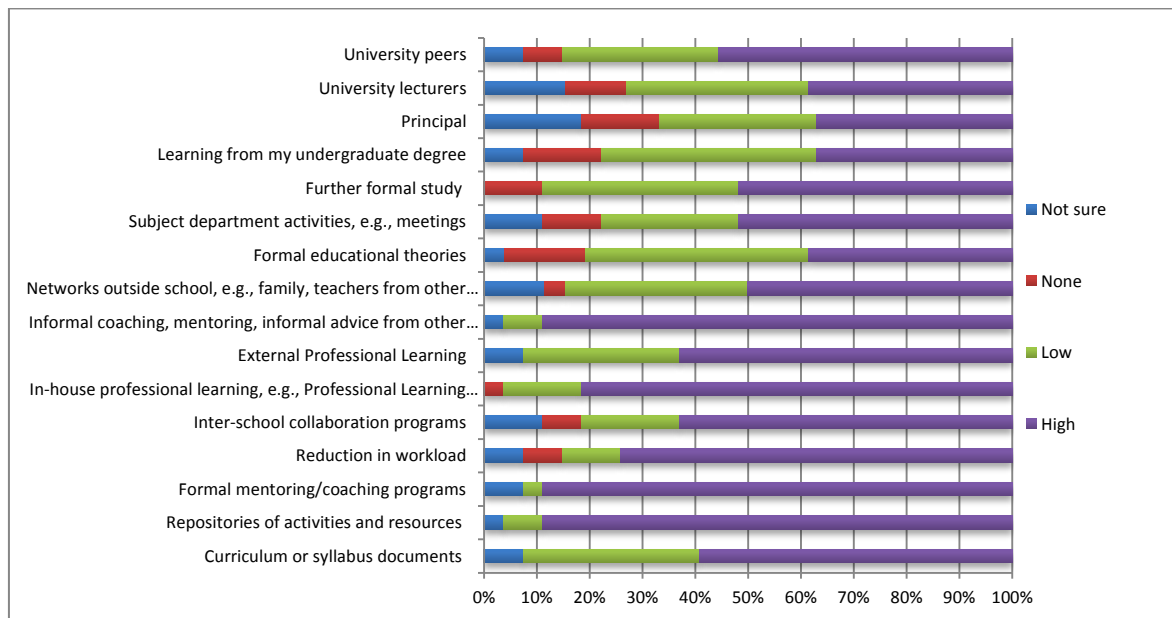


Figure 5. Supports: expected impact on confidence and competence

Generally all supports were considered useful, although the “Principal” had a high percentage of not sure or no usefulness (total 32%). The highest usefulness was the “repositories of activities”, “formal mentoring” and “informal coaching”, followed by “in-house professional learning” and “reduction in workload”.



Support mechanisms that were rated as highest usefulness but lowest expected availability are listed below. These are supports that pre-service teachers expect will be of high usefulness but do not expect to be accessible. The % represents the percentage of respondents who expected high usefulness but low availability of that support: Reduction in workload (26%); and Formal mentoring/coaching programs (19%).

Generally most of the support mechanisms were rated as useful. But there were some that were rated as being of limited use but highly available. These are the one’s that pre-service teachers expect to have good access to but to be of limited help. Only two mechanisms were rated in this way by only 4% of the respondents: Subject meetings (4%); and Learning from degree (4%).

A number of the support mechanisms were unknown in their availability and their potential usefulness. Perhaps these could be addressed more during initial teacher education: Interschool collaborations (33%); External PD (26%); In-house PD (22%); Learning from Undergrad (22%); Principal (22%); and Lecturers (22%).

In addition, a fit map from the Rasch analysis showed the inconsistencies of the responses, that is, the mis-fits, suggesting great variety in the expectations of the students. While the “n” is too small for university comparisons, it is useful to highlight items across the universities where there was greatest diversity. See Table 1.

Table 1. Fit map: inconsistencies in responses

Access to Supports	Inter-school collaboration programs
	Further formal study
	Principal
	University lecturers
Impact of challenges on confidence and competence	Presentation of content that is disconnected, or unrelated to student interests or life worlds, due to not understanding applications
	Negative impact on student learning
	Lack of both a personal commitment to the subject and enthusiasm and interest in what I am teaching
	Less commitment to participating in innovation
	Less commitment to participating in subject-related discussions
	Reliance on support from elsewhere

Interestingly, 6 of the 8 challenges showed consistencies, suggesting that the respondents showed great variety in how they positioned themselves in relation to out-of-field teaching and the potential impact it might have on their confidence and competence. This suggests that some students may be more resilient than other students, perhaps some students perceive themselves as more adaptable than others do. The problem in understanding this result arises because it is unknown whether a student who expects greater impact means that they are less resilient and adaptable, or whether they have a more realistic understanding of the pressure that out-of-field teaching can have on a teacher. Further investigation is needed here.

### *Interviews*

The data from two PSTs are included here. Matty (pseudonyms only) could be seen as somebody who, when teaching out-of-field, might position himself as “Pursuing an Interest” or “making the most of it” (according to the Hobbs Adaptability Scale). Cara, on the other hand could be seen as being positioned at the “Just Filling In” end of the Hobbs Adaptability Scale. Both pre-service teachers had been required to teach out-of-field on the school placements during their teaching degree.

Table 2 provides a summary of the responses to questions about support, challenges and opportunities, as well as the learning expected when teaching out-of-field. Cara was completing a typical teaching degree that provided extensive specialism-related pedagogy. Matty was completing a degree that provided general teacher pedagogy, leaving the specialism-related pedagogy to the extended school placements. Both had taught out-of-field on at least one of their placements.

Table 2. Matty and Cara

Dimension	Cara	Matty
Challenges expected through OOF teaching	Lacking confidence, not capable, reduced student learning outcomes, insufficient interest	Content, researching questions asked
Opportunities expected/gained through OOF teaching	More job opportunities through broader expertise	Giving students more ownership – teach the teacher.
Learning expected through OOF teaching	Learning different strategies, new skill set learning how to engage students differently	Content of OOF, strategies. Understand student levels, management issues, different pedagogy.
Resources or support expected for OOF teaching	Expect to be just ahead of students. Resources – not good, needs PD and mentoring. More preparation before teaching.	Other teachers, professional research, personal background knowledge in some OOF, seek other school resources

Cara explained that her commitment levels would remain the same when teaching out-of-field, “but it would be a very high level because I feel like I’d have to do a lot of background work to be able to teach it confidently”. The greatest challenge for her would be “thinking that I wasn’t capable of teaching it”, which is something she experienced when teaching out-of-field on her placement. On reflection she claimed that this experience gave her the opportunity to learn “more about myself than anything... that was one of the times I’d been sort of nervous on a placement to actually teach that class and survive.” Survival is often linked to out-of-field teaching, especially in the beginning years of teaching (Ingersoll 2004; McConney and Price 2009). In addition, Cara experienced some fear about the prospect of being asked to teach out of her subject area. She described a presentation from a visiting principal who explained that a teacher “was asked to teach a PE class and she taught Javelin to them and one student ended up getting injured quite badly... I know you can say no, I can’t sort of say that.” Survival, lacking confidence, fears, are all associated with a PST who is not yet certain about the environment she is going into, her capacity to adapt if needed, and to what extent she can shape her career.

Matty, on the other hand, felt that “a job is a job. If you’re a teacher, that would mean in any field... from my perspective teaching is not just the content, it obviously is in certain classrooms but I’m happy and willing to feel that with experience and the ability to learn I’d be able to adapt to any class, any subject, within reason to teach. You need to be adaptive in any situation...” His placement required him to teach in an integrated curriculum where he taught subjects out-of-field as part of a Year 7 (13 year olds) suite of subjects. According to Matty, a benefit of out-of-field teaching is an “advantage to give the student the ownership and give them some pride I suppose in teaching the teacher about that topic.” It is likely that the philosophy of the program influenced Matty’s ‘can do’ attitude to out-of-field teaching: “at uni there was no subject teaching as such. They don’t teach us English or maths or anything like that so it was really down to placement... A lot of people in the course really got hung up on being idealistic in teaching their own subjects”. For Matty, the subject is not seen as the organising mechanism for teachers. He exhibited a high degree of confidence in his ability to adapt, for the learning to be shared and therefore the power to be distributed, and a high capacity to learn.

These two stories signal the great diversity of graduate teachers entering the profession, some with great potential to adapt to the changing needs of the job, but some who appear to have less confidence and a perception of themselves as someone who can just “survive”.

### Conclusions and implications for teacher education

Both the survey and interviews suggest that soon-to-be graduate teachers are aware of the reality of out-of-field teaching potentially awaiting them in the years to come.

The positive response of students to these items in the survey suggests that more students have a positive view on the support they will receive, and that they recognize the opportunities a little more than the potentially negative consequences of teaching out-of-field. The evidence suggests that their commitment to various elements of teaching is less likely to be influenced

simply because they are teaching out-of-field. Very few types of support were considered as having limited use, although there were a relatively high proportion of supports that respondents were not aware of in terms of availability or how useful they would be. One of these was “Principals”, which suggests that almost a quarter of the sample had little exposure during their course to the principal’s roles in relation to teacher support if teaching out-of-field.

While there appears to be an overall air of optimism amongst the students, there was diversity in how, as graduate teachers, they expected to cope with the challenges that out-of-field teaching might bring. This diversity was particularly captured in the interviews by the contrasting positioning of Cara and Matty in relation to out-of-field teaching. Both had been exposed personally to out-of-field teaching. Both saw opportunities for learning. However, there appeared to be a juxtaposition of 1) a preference for efficiency over the challenge of the unknown, against 2) an embracing and expectation of innovation and a belief in one’s capacity to learn and learn with others. Future research is needed to explore how graduate teachers’ attitudes change when teaching out-of-field.

This research has messages for teacher education in ensuring that pre-service teachers are exposed to a range of supports that may help them. The relatively high proportion of respondents who considered the need to rely on others for support as a challenge is an important finding, and indicates a need for the teacher education courses to promote team and collegial support as an important part of teaching, particularly in the beginning years of teaching. With the highest proportion of teacher attrition being in the first five years (see, for example, Ingersoll 2003), new teachers should be able to confidently and without reservation feel permitted to draw on their more experienced colleagues for support, if needed.

Finally, ongoing teacher learning is needed by all teachers. However, the added pressures on teachers when out-of-field has been documented. While the provision of support cannot replace retraining in a new specialism, support is very important in determining a teacher’s capacity to cope, adapt and learn when crossing boundaries between in-field and out-of-field teaching spaces. For graduate teachers, a “can-do” attitude would be very attractive to teachers, however, research has shown that school environment and supportive and sympathetic leadership are central (Du Plessis, Carroll and Gillies 2014) for even the more fearsomely confident graduate teachers to develop or retain adaptive expertise.

## Acknowledgements

This work was supported by a Deakin University Central Research Grant Scheme, 2013.

## References

- Akkerman, S., and A. Bakker. 2011. “Boundary crossing and boundary objects.” *Review of Educational Research* 8 (2): 132-169.
- Auditor General (Victoria) 2012. “*Science and mathematics participation rates and initiatives.*” *Auditor Report 139, Session 2010-12*. Melbourne: State of Victoria.
- Bosse, M., and G. Törner. 2013. “Out-of-field teaching mathematics teachers and the ambivalent role of beliefs - a first report from interviews.” In *Current state of research on mathematical beliefs XVIII*. Proceedings of the MAVI-18 Conference edited by M. Hannula, P. Portaankorva-Koivisto, A. Laine, and L. Näveri, 341-355. Helsinki.
- Crisan, C., and Rodd, M. 2011. “Teachers of mathematics to mathematics teachers: a TDA mathematics development programme for teachers.” In *Proceedings of the British Society for Research into Learning Mathematics*, edited by C. Smith, 29-34. <http://www.bsrlm.org.uk/IPs/ip31-3/BSRLM-IP-31-3-06.pdf>
- Darby, L. 2009. “Translating a “relevance imperative” into junior secondary mathematics and science.” *Eurasia Journal of Mathematics Science and Technology Education* 5 (3): 277-288
- Department of Education, Science and Training (DEST) 2003. *Review of teaching and teacher*

*education*. Canberra: Commonwealth of Australia.

Du Plessis, A., A. Carroll, and R. Gillies. 2014. “Understanding the lived experiences of novice out-of-field teachers in relation to school leadership practices.” *Asia-Pacific Journal of Teacher Education* 43 (1): 4-21.

Dyson, M. 2005. Australian teacher education: “although reviewed to the eyeball is there evidence of significant change and where to now?” *Australian Journal of Teacher Education* 30 (1): 37-54.

European Commission 2011. *Literature review: quality in teachers’ continuing professional development*, European Commission. [http://ec.europa.eu/education/policy/strategic-framework/doc/teacher-development\\_en.pdf](http://ec.europa.eu/education/policy/strategic-framework/doc/teacher-development_en.pdf)

Hobbs, L. 2013. “Teaching out-of-field’ as a boundary-crossing event: factors shaping teacher identity.” *International Journal of Science and Mathematics Education* 11 (2): 271-297.

Hobbs, L., C. Campbell, S. Herbert, and M. Cole. 2012. *Discipline-related commitments and identities of out-of field early career teachers*. Paper presented to the Contemporary Approaches to Research in Mathematics, Science, Health and Environmental Education, Deakin University Melbourne, 29-30 November 2012. Online proceedings

Holyoak, K. 1991. “Symbolic connectionism: toward third-generation theories of expertise”. In *Toward a general theory of expertise: prospects and limits*, edited by K. Ericsson and J. Smith, 301-335. Cambridge: Cambridge University Press.

House of Representatives Standing Committee on Education and Vocational Training. 2007. *Top of the class: report on the inquiry into teacher education*. The Parliament of the Commonwealth of Australia: Canberra.

Ingersoll, R. 1998. “The problem of out-of-field teaching.” *Phi Delta Kappan* 79 (10): 773-776.

Ingersoll, R. 2003. *Is there really a teacher shortage?* Center for the Study of Teaching and Policy, University of Washington.

Ingersoll, R. 2005. “The problem of underqualified teachers: a sociological perspective.” *Sociology of Education* 78(2), 175–178.

Lyons, T., R. Cooksey, D. Panizzon, A. Parnell, and J. Pegg. 2006. “*Science, ICT and mathematics education in rural and regional Australia the SiMERR national survey: a research report* prepared for the Department of Education, Science and Training. National Centre of Science, ICT and Mathematics Education for Rural and Regional Australia, University of New England.

Marginson, S., R. Tytler, B. Freeman, and K. Roberts. 2013. *STEM: Country comparisons*. Melbourne: The Australian Council of Learned Academies. <http://www.acola.org.au>.

McConney, A., and A. Price. 2009. “Teaching out-of-field in Western Australia.” *Australian Journal of Teacher Education* 34 (6): 86–100.

Ríordáin, M., and A. Hannigan. 2009. *Out-of-field teaching in post-primary mathematics education: an analysis of the Irish context*. A Research Report. <http://www.nce-mstl.ie>

Stake, R. 2005. “Qualitative case studies”. In *The Sage handbook of qualitative research*, edited by N. Denzin and Y. Lincoln, 443-466. Thousands Oaks: Sage Publications.

Star, S. 1989. “The structure of ill-structured solutions: boundary objects and heterogeneous distributed problem-solving.” In *Distributed artificial intelligence vol. II* edited by L. Gasser and M. Huhns, 37-54. London: Pitman.

Steyn, G., and A. du Plessis. 2007. “The implications of the out-of-field phenomenon for effective teaching, quality education and school management.” *Africa Education Review*, 4 (2): 144–158.

Wenger, E. 1998. *Communities of practice: learning, meaning and identity*. Cambridge: Cambridge University Press.

McConney, A., and A. Price. 2009a. *An assessment of the phenomenon of 2teaching out-of-field” in WA schools*. Perth: Western Australian College of Teaching.

[Back to contents](#)



## **Information and communication technology in special education: to what extent does ICT support learning and participation for pupils seen to have special educational needs?**

*Terje Mølster & Kari Nes*

*Hedmark University College, Norway*

terje.molster@hihm.no

### **Abstract**

The research question posed in this paper is: to what extent do information and communication technology (ICT) support learning and participation for pupils in regular schools who are seen to have special educational needs (SEN)? Developing learning and participation is seen as the basics of inclusive education. To illuminate these issues, data collected in a national research project, the SPEED project, about the quality of special education in Norway are used. One of the results so far is that using ICT is not very widespread in special education in schools, even if pupils receiving special education on average use ICT more than other pupils. Finally the results are discussed in the light of previous research and implications for teacher education.

**Keywords:** ICT; special education; inclusive education.

### **Context of the research**

Since our study has taken place in special education in Norwegian schools, we need to contextualise what this is about. Special education throughout the ten years' compulsory education in Norway mostly takes part in regular schools. About 97% of all Norwegian learners aged 6-16 attend the common, free mainstream school, run by the local educational authorities (The Norwegian Ministry of Education 2011). After 1975 no children, even if they are disabled, can be denied access to the local school. Girls and boys and high and low achievers from diverse socio-cultural backgrounds attend class together. There is no permanent streaming according to ability. All learners are to receive differentiated and adapted instruction in the local school. Very few (less than 1%) are in special schools, and about 2.2% are in private schools. Bilingual children have certain specific rights to adapted support. Sámi children have their own syllabus in the Sámi language. Even if special schools are practically non-existent, special education is a right for those seen by an expert assessment to need it. The right to special education is non-categorical; it is intended to ensure adapted and equitable education for persons who do not, or cannot, gain satisfactory benefits from the regular teaching (Education Act §5-1). Through an expert assessment ('statementing') it is decided whether the pupils in question are entitled to special education and hence additional resourcing. Special education is offered to an average of about 8% of the pupils. Part time special education in (or in connection with) ordinary classes is the most common organisation of the special educational programme (The Norwegian Ministry of Education 2011). In addition to pupils with a disability, the SEN-group<sup>1</sup> consists of pupils with dyslexia or other learning problems and pupils with behavioural problems. The extent of special education lessons offered varies from just a couple per week to most lessons. The rest of the week the pupil follows the ordinary programme of the class. The intention is to offer special education in the ordinary classroom, but an increase in use of pull-out solutions and special classes is registered (Nes 2010). All learners, with or without SEN, are supposed to be in a learning environment characterised by adapted education, meant to provide equal opportunities in the school for all, "regardless of abilities and aptitudes, age, gender, skin color, sexual orientation, social background, religious or ethnic background, place of residence, family education or family finances" (The Norwegian Directorate for Education and Training 2008). Special education is seen as part of the adapted education.

## Research questions

There are many unknowns concerning the relationship between ICT and special education in the present educational setting in Norway, for instance: In what ways is ICT used in and out of special educational lessons for pupils with a statement of SEN? What is the function of ICT in special education? What are teachers’ attitudes and competences regarding the use of ICT in special education? Does the use of ICT promote inclusion? How do learners experience the way ICT is used in special education? Our research questions address some of these issues. Thus, the main research question is: to what extent does ICT support learning and participation for pupils in regular schools who are seen to have SEN?

It has two sub-questions, as follows: to what extent is ICT in any form used by SEN-pupils? To what extent does the actual use of ICT support learning and participation for SEN-pupils?

## Theoretical framework

### *Developing learning and participation = inclusion*

“Developing learning and participation in schools” is the subtitle of the Index for Inclusion, indicating how inclusion is framed in that book (Booth and Ainscow 2011). By talking about learning and participation in our project, we want to emphasise the necessity for learners to belong to a learning community as well as to a social and cultural community. We see these as two basic pillars of inclusion in education (Booth and Ainscow 2011, Nes, Strømstad, and Skogen). Identifying and reducing barriers to learning and participation then becomes the educational challenge. The barriers are not primarily seen to be inherent in the child, rather as part of the learning environment, such as teaching and learning methods & materials. The materials may function as barriers to learning and participation, or they can support it. An inclusive school aims at identifying such barriers, as well as the resources to address and remove the barriers. In our case, how can the use of ICT help to overcome barriers to learning and participation for SEN-pupils? A simplified model of what inclusive education is about may look like the one shown in Table 1.

Table 1. A simple model of inclusion

Inclusive Education	
Developing participation/ removing barriers to participation	Developing learning/ removing barriers to learning

### *Information and communication technology in general and special education*

The belief that ICT in education enhances learning and participation for all is widespread.

In Norwegian schools, a pupil’s ability to make use of information and communication technology is seen as one of five basic skills, along with reading and writing etc. (LK 06). The basic skills are incorporated into the subject syllabuses for all subjects. Does this mean that the more ICT is used in education, the better you learn?

Research on the relationship between use of ICT and pupils’ learning shows contradictory findings. Despite huge investments in technology, we lack clear indications that ICT actually promotes learning in school, when looking at the broad picture. When it comes to special education, the situation is more-or-less the same as for pupils in general, despite the existence of useful tools and software for pupils with various learning difficulties (Brodin 2010). However, there is evidence from Norway and elsewhere that pupils who use such tools can improve their learning outcome, for instance when dyslectic pupils overcome some of the barriers they experience (Fasting 2008). For persons with impairment various digital devices can facilitate learning and compensate for their loss to some extent, if they have access and competent support, for instance as put by the World Health Organization:

“Assistive devices and technologies such as wheelchairs, prostheses, mobility aides, hearing aids, visual aids, and specialized computer software and hardware increase mobility, hearing, vision and

communication capacities. With the aid of these technologies, people with a loss in functioning are able to enhance their abilities, and are hence better able to live independently and participate in their societies.” (World Health Organization 2014, n.p.).

However, research on the use/usability of ICT for pupils with disability is practically non-existing, both in Norway and internationally (Söderström 2010). Based on the little research that exists, we can state that although digital technology has opened new opportunities for participation and inclusion, it seems that schools so far not have been able to exploit digital technology to achieve more inclusive education (Krumsvik 2007; Brodin 2010; Söderström 2010). But, Norwegian teachers think favourably about ICT, for instance the majority of Norwegian teachers in the 7<sup>th</sup> and 9<sup>th</sup> grade agree that the use of ICT promotes reading, writing and collaboration. More than 80% agree that the use of ICT facilitates differentiated education (Egeberg, Guðmundsdóttir, et al. 2012, 132). But, the bi-annual Monitor evaluation reports from the ICT center do not study “the use of ICT for inclusion” (inclusion here understood as inclusive settings for pupils with disabilities/special needs).

ICT is not only treasured for its compensatory value, but, as indicated by WHO above, through this technology opportunities to participate in society are increased. Barriers to participation are removed or reduced. Already from the 1960s and onward it has been claimed that technology helps to increase participation and inclusion for learners with disabilities, in and out of school (Brøyn and Schultz 2005; Brodin 2010; European Agency for Development in Special Needs Education 2013). However, some learners receiving special education may feel stigmatised when using technical aids that are designed for disabled people (Lupton and Seymour 2000; Pape, Kim, and Weiner 2002). According to Söderström (Söderström 2010) these learners therefore prefer using the same technology as the rest of the class.

## Research methodology

Our project is part of an ongoing research project funded by the Norwegian Research Council - the SPEED project<sup>2</sup>. This project is looking into a range of aspects concerning the quality of special education in primary and lower secondary education in Norway.

The S (Table 2) indicates source data for our sub-project about ICT and special education: survey data from different groups of informants and classroom observations of pupils with SEN. The A indicates other data available in the project. Our sources in this article are the survey and the classroom observations. In the survey the sample was 4 cohorts of children with and without special education between age 10 and 16 in two towns. The survey reveals what the children say and what their teachers say about them. It has been run twice with a year in between, T1 and T2. The T1 survey also included other municipalities than the two specific towns.

Table 2. Research methods and informants in the SPEED- project

Informants \ Methods	Survey	Screening tests	Classroom observations	Interviews
Pupils, whole class	S	A		
SEN-pupils	S	A	S	A
Contact teacher	S			A
Special teachers				A
Other staff	A			A
Parents	A			

For the classroom observations an instrument based on the “Time-Sample Measures of Behaviour” approach was developed (Powell, Martindale, and Kulp 1975, Haug 2012). The target of the observations was SEN pupils who were taking part in special education in or out of their regular class, usually in a part-time special education programme. Every 5 minutes the observer ticked off the actual activity the target pupil was displaying or the situation (s)he was in. The categories were predefined. The research design allows for combining survey data with observation data on an individual level.



### *Operationalization of ICT use*

The main variables concerning ICT are the following seven questions put to the pupils about how often they use ICT in their schoolwork:

1. How often do you use computers in the subject Norwegian?
2. How often do you use computers in the subject Mathematics?
3. How often do you use computers when presenting for the class?
4. How often do you use computers to write assignments?
5. How often do you use computers to take notes?
6. How often do you use computers for collaboration?
7. How often do you use computers to communicate with the teacher?

It was made clear for the informants that the notion “computer” includes artefacts like PC, mac, tablet, iPad, mobile phone etc. All variables have a nominal scale ranging from 1 indicating the lowest level of ICT-use to 5 indicating the highest level (1 Never, 2 Several times a month, 3 once a week, 4 Several times a week, 5 Daily). By using the principal component analysis in SPSS, we found that the seven questions on ICT-use can be reduced to one factor representing pupils' use of ICT in school. The factor, Total Use of ICT, is computed as the sum of scores on each of the underlying questions. Total Use of ICT ranges from 7 (if the pupil has scored 1 in all seven questions) to 35 (if the pupil has scored 5 in all of the questions). In the analysis we have tried to find correlations between use of ICT and indicators of inclusion. In order to study possible differences between high and low usage of ICT, we have constructed two groups of pupils: the high frequency users and the low frequency users. According to our definition, pupils scoring 21 or higher on the Total Use of ICT belong to the group of high frequency users, while pupils scoring less than 21 belong to the group of low frequency users.

### *Operationalization of inclusion*

In the Index for Inclusion the expression developing learning and participation refers to schools. What we do here is to “translate” this approach to teacher and pupil level; how do these crucial stakeholders in schools experience some of the important aspects of learning and participation? The questions used in the digital survey were picked from national and international instruments that are proven sufficiently reliable and valid. Factor analysis was applied in the analysis of survey data to identify aspects of participation and learning (Table 3) in the survey<sup>3</sup>.

Table 3. Operationalization of inclusion in the survey, selected factors

Informants	Inclusion as developing participation. Factors.	Inclusion as developing learning. Factors.
Pupils	Social relations Social isolation	
Contact teachers/Class teachers		Motivation Academic achievement

#### *Questions in the factor social relations (pupil reply)*

Social relations in school are about the children as well as teachers and other adults, but here our focus is on the peer relations, the scale being from totally agree (1) to totally disagree (4):

- If someone is having problems, classmates will help;
- If someone is exposed to injustice, classmates will help;
- The pupils in this class know each other well;
- The pupils in this class are friends;
- Some pupils in this class do not go well together;
- I have become friendly with many pupils in this class;

- In this class you are accepted even if you are not so clever as/ differ from others;
- My classmates do not bother how I am;
- My classmates like me;
- I do not go so well with some of the pupils in class.

*Questions in the factor social isolation (pupil reply)*

Participation is represented by the factors social isolation and social relations. “Social isolation” was operationalised in three questions, asking the children to tick off on a scale from 1 (never) to very often (5): I feel lonely at school; I am sad at school; during breaks between lessons I am with other pupils.

*Questions in the factor motivation (teacher reply)*

Class teachers regarded on a scale from 1 (very high) to 5 (very low) the pupil’s: motivation to succeed in school; ability level compared to others in the class; interest in learning in the lessons; efforts during lessons

*Questions on the factor academic achievement (teacher reply)*

Class teachers were asked to assess the academic achievement of the pupil on a scale from 1 (very low) to 6 (very high) in the subjects Norwegian, Mathematics and English.

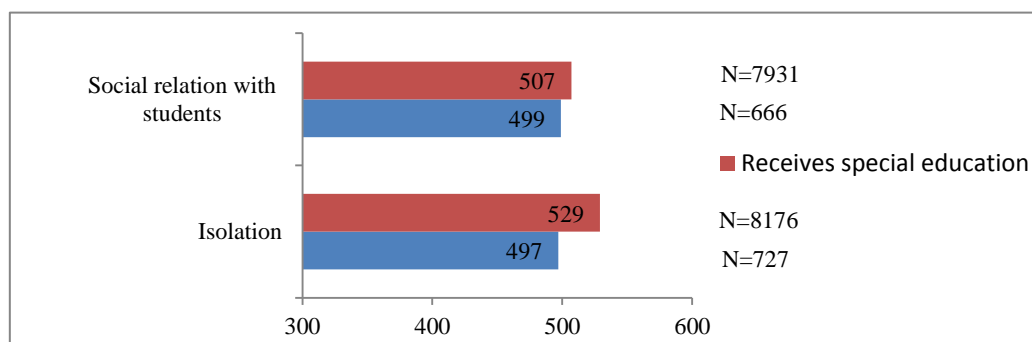
**Findings**

The results in this paper are based on the structured net-based survey and on the classroom observations in the SPEED project.

***Inclusion, the general picture***

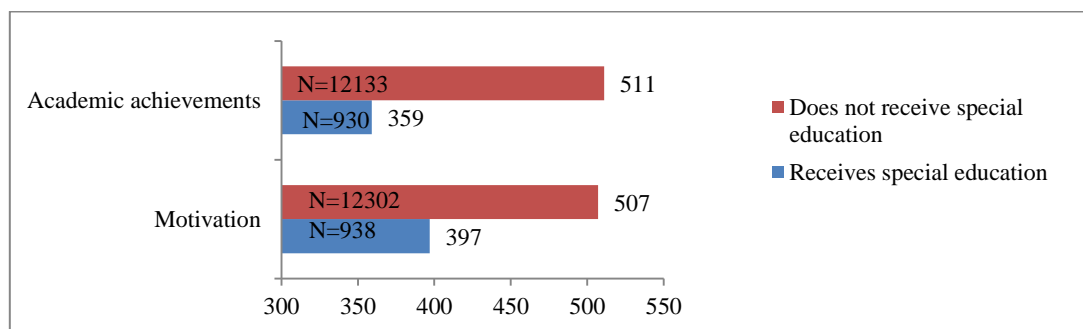
Before exploring specific issues on ICT, let us see how pupils identified as having special educational needs and their teachers score on our learning and participation factors when compared with pupils without such needs. In the comparison of groups we use the PISA scale where the overall average is set at 500 points, and one standard deviation (SD) equals 100 points. Differences (effect size) of 0.4 SD or more are often regarded as substantial differences (Hattie 2009). The participation factors in this study are isolation and social relations, as operationalized in the questions cited above. From the table above (Table 4) we can see that pupils who receive special education tend to feel more isolated in schools than their peers, but the difference is not very big (0.3 SD). But when it comes to the factor about relations to other pupils, the difference between the two groups is next to nothing. This clearly indicates that the SEN pupils as a group do not feel excluded in a peer perspective, even if some are isolated. Turning to inclusion the learning perspective, let us now look at what the teachers say about their pupils.

Table 4. Pupils’ view of participation: isolation and social relations



Not surprisingly we see that teachers regard the academic achievements of pupils who receive special education as far below the rest. The standard deviation (SD) is more than 1.5, which is a huge difference. But, there is also a considerable and alarming gap as to motivation for school work between the two groups, more than 1 SD.

Table 5. Teachers’ view of academic achievements and motivation for pupils with and without special education



### ICT use, pupils with and without SEN

In analysing the observation data, we wanted to find out the extent of ICT use among the SEN-pupils. In the next table (Table 6) we see how many of the 5 minutes’ interval observations of the SEN-pupils revealed any ICT activity.

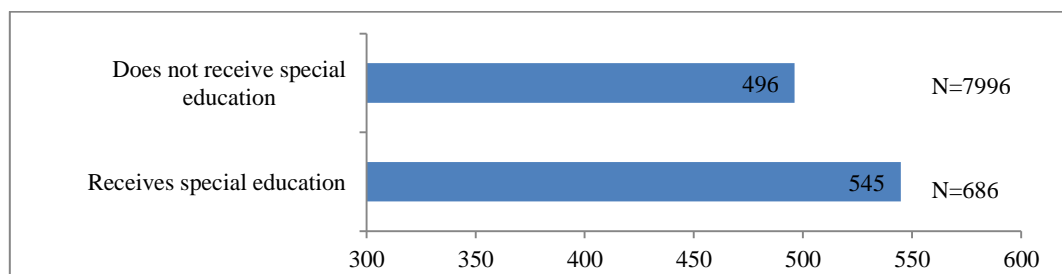
Table 6. The extent of ICT-activity among SEN-pupils during the classroom observations

Total number of observations	Number of observations of pupils using ICT	Observations with ICT (%)
673	364	4,75

Less than 5% of all the observations include any use of ICT among the SEN-pupils. When we consider the number of “pupils” we are talking about - not the number of observations - we find that 36% of the SEN-pupils in primary schools used ICT once or more during the observation period, which was one whole day at school. For secondary school the percentage was 28, which means the older the age of the pupils, the less they used ICT.

The next table (Table 7) refers to the factor of self-reported ICT use in the survey. Pupils who receive special education use ICT significantly more than those who are not seen as having special educational needs (the difference is 0.5 SD).

Table 7. Total use of ICT. Pupils with and without SEN

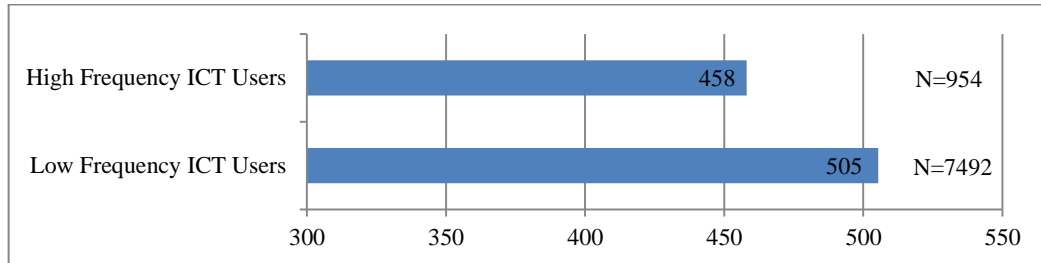


When we compare the mean score on academic achievement for the group of pupils using ICT most frequently (the high frequency group) with the group using ICT less frequently (the low frequency group) we find a significant difference in favor of the low frequency group (Table 8).

Note that the SEN pupils are overrepresented in the high frequency group since 16.8% of the pupils in this group receive special education, while only 6.8% of the low frequency group receive special education. Possible explanations may be that although ICT is used extensively by some

pupils, relatively speaking, it is perhaps not always used in ways that develop the digital skills the Norwegian curriculum calls for. In the current debate in Norway this is suggested. Is ICT used for other things than targeted subject learning? Or, for the SEN pupils, is the extended use of ICT about particular programmes or technologies introduced to compensate for their difficulties?

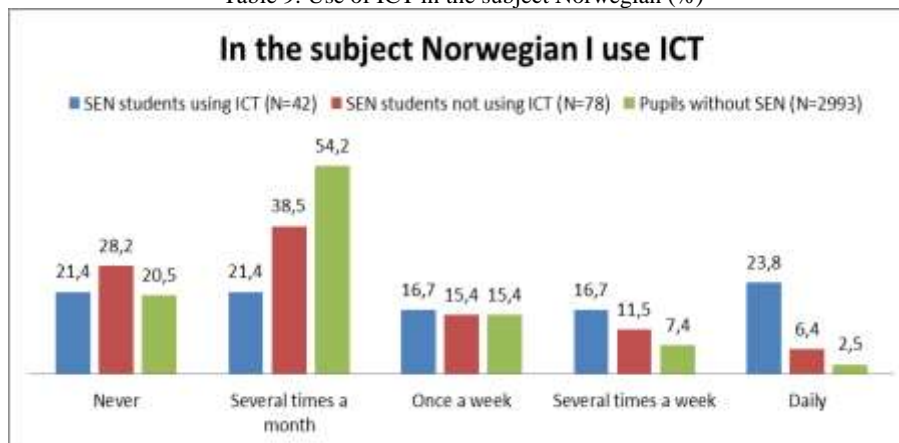
Table 8. Teachers' view of academic achievement. High and low frequency ICT users



### *ICT use in Norwegian*

The next table (Table 9) may indicate the use of compensatory ICT in the subject Norwegian for some of the SEN-pupils. This subject is where the use of ICT is the highest. Data from the observations are combined with survey data. The blue columns show that the SEN pupils who were observed using ICT also report far more than others that they use ICT daily or several times a week in Norwegian (40.5% , while pupils without SEN score 9.9%).

Table 9. Use of ICT in the subject Norwegian (%)



From the survey we also know that high frequency users of ICT like the subject Norwegian better than other pupils. But, nearly half (48.7%) of our group of ICT users from the observations ticked off in the survey that they never used ICT to present for the class, compared to 30% of other SEN-pupils and 20% of pupils without SEN. This is not a promising result from an inclusion perspective. Even if we have seen that some criteria of social participation are met for the SEN-pupils, this result reveals a lack of participation in the learning community.

### *Staff competence and use of ICT*

The next issue is the relation between the competence of the staff that provides support and activities for the pupils when special educational lessons are taking place. Does the extent of ICT use vary with who is in charge?

These data (Table 10) clearly indicate that when the teachers who are trained in special education, are responsible for the special education lesson, the pupils use ICT more than with other staff. When special teachers were responsible for the special education lessons, twice as many

observations of ICT use were done as in the case of the class teacher.

Table 10. Observations of ICT use – who is in charge of the lesson? (%)

	Class teacher in charge (N=193)	Special teacher in charge (N=157)	Assistant/others in charge (N=106)
Pupil uses ICT	12	24	16

### Conclusions and implications for teacher education

Findings so far in the SPEED-project indicate that digital learning is not very widespread in either regular or special education, and less in secondary than primary education. This is in accordance with other findings (Egeberg, Björk Gudmundsdottir, et al. 2012). However, pupils receiving special education use ICT more than other pupils on average. Probably is there a much greater potential still for supporting learning by using for instance particular software for this group of pupils.

Among the SEN-pupils there is little or no difference in learning outcome between high frequency and low frequency users of ICT. Comparing with pupils without SEN on inclusion indicators, we see that when experiences of “participation” are concerned, the SEN-pupils report that they feel as accepted and participating in a social fellowship as other pupils, but less in a learning community. It is worth noticing that there are more SEN-pupils than others who see themselves as isolated at school.

When it comes to inclusion as developing “learning”, teachers view the SEN-pupils as not so included. They are very low achieving and not as motivated and hard-working as the others. But in the subject Norwegian 1/3 of the observed SEN-pupils report using ICT a lot. The high frequency ICT users tend to like the subject better than others too. From our data there are few other indications that ICT plays a distinct part in either supporting or preventing inclusion. An indirect indicator is the finding that the best-educated teachers use ICT more than others in teaching the SEN-pupils.

The crucial point is not only how much digital technology is used, but how it is used. To use it adequately in education, the “teachers’ digital competency” is the key factor, in our case particularly the competence in using ICT in special education. We assume that when the best qualified teachers use ICT more, this is due to better digital qualifications, and that better qualified teachers support children’s learning in a more professional way. The latter is shown by many writers, for instance Egelund (Egelund et al. 2009). But special education in Norway is not always given by the best qualified staff; only in half of the special education lessons observed in the SPEED project was the special educator in charge. Pairing the competent special educator and the child who has a statement of special needs has the potential of increasing learning, digital as well as other learning.

In teacher education and in in-service training the students/teachers need to meet and become comfortable with some artefacts and programmes within ICT to be able to analyse the affordances and limitations for their own teaching. The European Agency for Special Needs and Inclusive Education (European Agency for Development in Special Needs Education 2013) has been looking into ICT for inclusion in several European countries. One strong recommendation from them is that the training of educational staff in the use of general and specialist ICT must be considered a priority area. This brings us to a state or systems level, while our research has been dealing with teacher and pupil experiences. But inclusion needs to be addressed on several levels, from the individual pupil to teacher education and overarching values as well as national policies (Haug 2014). Then we can add a vertical dimension to the simple inclusion model we introduced in Table 1. On each level issues of developing participation and learning will need attention. Increasing research based knowledge of what is happening on levels 1 and 2 (Table 12) will inform decisions on the upper levels. We hope that our inquiry will make a small contribution to this.

Table12. Levels of inclusion

Inclusion		
Levels of inclusion	Developing participation/ removing barriers to participation	Developing learning/ removing barriers to learning
4. STATE level: Values, ideologies and policies. Teacher education.		
3.MUNICIPALITY/school owner level: Organization & conditions		
2.SCHOOL and classroom level: Teaching and learning		
1. PUPIL level: Does (s)he learn and participate?		

## Acknowledgements

This work was supported by The Research Council of Norway under grant number 218326.

## Endnotes

1. By SEN-pupils we will here refer to pupils with a formal identification of special educational needs according to § 5-1
2. About the SPEED project, see <http://www.hivolda.no/speed>
3. This paper refers to relevant selected factors in the material. The construction of factors meets the statistical demands of scale constructions, i.e. high Cronbach's Alfa and medium inter item correlation. Adaptations were done for inverted questions (when high scores mean the less desirable option).

## References

- Booth, T., and M. Ainscow. 2011. *Index for inclusion: developing learning and participation in schools*. 3 ed. Bristol: Center for Studies on Inclusive Education (CSIE).
- Brodin, J. 2010. "Can ICT give children with disabilities equal opportunities in school?" *Improving Schools* 13 (1): 99-112. doi: 10.1177/1365480209353483.
- Brøyn, T., and J-H. Schultz. 2005. *IKT og tilpasset opplæring*. Oslo: Universitetsforl.
- Egeberg, G., G. Gudmundsdottir, O. Hatlevik, G. Ottestad, J.Skaug, and K. Tømte. 2012. "Monitor 2011 - the digital state of affairs in norwegian schools." *Nordic Journal of Digital Literacy* 7 (1): 73-77.
- Egeberg, G., G.Guðmundsdóttir, O.Hatlevik, G. Ottestad, J.Skaug, and K. Tømte. 2012. *Monitor 2011 - skolens digitale tislend*. Tromsø: the Norwegian centre for ICT in education. <https://iktsenteret.no/sites/iktsenteret.no/files/attachments/monitor2011.pdf>
- Egelund, N., S.Tetler, G.Andersen, C. Dyssegaard, and B. Persson. 2009. *Effekter af specialundervisningen: pædagogiske vilkår i komplicerede læringsituationer og elevernes faglige, sociale og personlige resultater*. København: Danmarks Pædagogiske Universitetsforl.
- European Agency for Development in Special Needs Education. 2013. "Information and communication technology for inclusion: developments and opportunities for European countries". In *e-Reports: European Agency for Development in Special Needs Education* (EADSNE).
- Fasting, R. 2008. "IKT-basert læringsstøtte for elever med lese- og skrivevansker." *Spesialpedagogikk* 73 (7): 61-75.
- Hattie, J. 2009. *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.
- Haug, P. 2012. *Kvalitet i opplæringa: arbeid i grunnskolen observert og vurdert*. Oslo: Samlaget.
- Haug, P. 2014. "Er inkludering i skulen gjennomførleg?" In *De utenfor: forskning om spesialpedagogikk og spesialundervisning*, edited by S. Germeten, 15-38. Bergen: Fagbokforlaget.
- Krumsvik, R. 2007. *Skulen og den digitale læringsrevolusjonen*. Oslo: Universitetsforl.
- Lupton, D., and W. Seymour. 2000. "Technology, selfhood and physical disability." *Social Science*

& *Medicine* 50 (12): 1851-1862.

Nes, K. 2010. “The first decade of the 21st century: a backlash for inclusion in Norwegian schools?” *Zeitschrift für Inklusion-online.net* 2.

Nes, K., M. Strømstad, and K. Skogen. *Inkluderende skoler? Casestudier fra fem skoler*. Forfatterne: Høgskolen and Hedmark.

Pape, T., J. Kim, and B. Weiner. 2002. “The shaping of individual meanings assigned to assistive technology: a review of personal factors.” *Disability & Rehabilitation* 24: 5-20.

Powell, J., A. Martindale, and S. Kulp. 1975. “Evaluation of time-sample measures of behavior.” *Journal of Applied Behavior Analysis* 8 (4): 463-469. doi: 10.1901/jaba.1975.8-463.

Söderström, S. 2010. *Teknologibruk i den digitale enhetsskolen: en pilotstudie av bruk av informasjons- og kommunikasjonsteknologi (IKT) i skolehverdagen for grunnskoleelever med nedsatt funksjonsevne*. Trondheim: NTNU samfunnsforskning, Avdeling for mangfold og inkludering.

The Norwegian Directorate for Education and Training. 2015. *Equity in education for all - understanding central concepts 2008* 24 February. [http://www.udir.no/Upload/Brosjyre/5/Likeverdige\\_eng\\_jan%202008.pdf](http://www.udir.no/Upload/Brosjyre/5/Likeverdige_eng_jan%202008.pdf).

The Norwegian Ministry of Education. *Meld. St. 18 (2010-2011) Report to the storting (white paper) summary*. Norwegian Ministry of Education 2011. <http://www.statped.no/Global/Publikasjoner/Learning%20together%20white%20paper%20Meld.%20St.%2018%2020102011.pdf>.

World Health Organization. 2014. *Disabilities and rehabilitation*. World Health Organization 2014 21 February. <http://www.who.int/disabilities/technology/en/>.

[Back to contents](#)

## **Developing learning tasks in a technological learning workshop with LEGO mindstorms and additive manufacturing as the main pedagogical tools**

*Birger Brevik & Jon Ingar Holtet*

*Oslo and Akershus University College of Applied Sciences, Norway*

birger.brevik@hioa.no & Jon-Ingar.Holtet@hioa.no

### **Abstract**

This article is based on the results from two different studies - a qualitative study of how Electricity and Electronics teachers utilise LEGO Mindstorms as a pedagogical tool in Norwegian upper secondary schools, and a study investigating how educational institutions, and one technology company, use additive manufacturing as a tool. Selected results from Study I, and results from Study II, may be summarised into the following six categories: simulation, creativity, spatial reasoning, usability, complexity and prototype. Our main finding is that pupils, apprentices and students have problems understanding what a three-dimensional object drawn on a computer or on paper is like in real life. This turned out to be one of the reasons why the educational institutions had acquired 3D printers to serve as pedagogical tools.

**Keywords:** LEGO Mindstorms; additive manufacturing; spatial reasoning; pedagogical tools; vocational teacher education.

### **Context of the research**

In this article, we will discuss whether two different pedagogical tools are applicable for developing technology-based learning tasks in school workshops or classrooms. The empirical material on which this discussion is based is gained from two different studies, one of which involved a previous study of how electricity and electronics teachers use LEGO Mindstorms as a pedagogical tool in Norwegian upper secondary schools (Brevik 2014), and the other - whose methodological aspects will be described in this article - investigated the use of additive manufacturing in educational institutions, as well as in technology companies.

We will also discuss the vocational teacher education in Norway in order to see whether their professional identity may contribute to the study of transitions in the teacher education field.

Both our studies were of a qualitative kind, based on qualitative interviews of a small number of informants. Whereas Study I was based on a more traditional form for analysis of the empirical data through a theoretical framework (Goodlad, Klein, and Tye 1979), the analysis of the data from Study II's interview-based survey was established on open-ended categorisations without a previously defined theoretical framework, in accordance with the constant comparative method (Glaser and Strauss 1967). The theoretical framework for the discussion of our results was taken from Study I, and is based on Seymour Papert's (Papert 1980) constructionist theory on learning.

### **Research question**

The issue we researched can be summarised with the following question: How can teachers use LEGO Mindstorms and additive manufacturing as their main pedagogical tools for developing learning tasks in a technological learning workshop?

### **Theoretical framework**

#### *Vocational teacher education*

The Norwegian three-year vocational teacher education requires students to be trained



skilled workers compared to European qualifications framework for lifelong learning level 4 (EQF 2012), have at least two years’ relevant practice after passing the trade- or journeyman’s examination, plus university admissions certification or admissions certification based on total qualifications. The vocational teacher education is comprised of three components: width, depth and the vocational discipline consisting of vocational pedagogy and vocational didactics. In addition, pedagogical and professional practice constitutes a large part of the three-year programme. The depth element of the programme involves specialisation in one’s own field, where the students gain professional skills beyond the equivalent of EQF level 5. However, the post-graduation skill level of these teacher students is ranked at EQF level 6, which, among other things, is indicated in how their education qualifies them for entering Master-level studies on EQF level 7.

The former vocational teacher education practice in Norway was to complete a one-year practical-pedagogical programme in addition to craft certification with trade- and journeyman certificates, two years’ relevant practice and two years of work-related theoretical training equivalent to EQF level 5. We may ask whether practice as vocational teachers can be regarded as a profession or a semi profession. Brevik and Lier (2013) claim, in their article “Technical and Vocational Teacher Education Practice: Profession or Semi Profession?”, that being a “vocational teacher can be regarded as belonging to a profession today if we consider the European Qualifications Framework (EQF) as a basic standard”. This means that vocational teachers today may have a professional identity comprised of both vocational education and teacher training.

### ***Vocational education***

The Norwegian vocational teacher education trains teachers for vocational schools, which cater to a little less than 50% of all the pupils attending upper secondary schools in Norway, and is a large market as such. Year 2009 statistics show that the average number of European pupils completing vocational schooling was 49.6%, whereas the corresponding figure for Norway was 54.1% (EACEA 2012, 74). However, these figures are currently changing in Norway, as the share of applicants for the first year of vocational training between 2012 and 2014 has decreased from 53% to 50%.

Norwegian upper secondary education is made up of either three programmes for general studies or nine vocational programmes. Whereas the programmes for general studies are carried out through three years’ schooling, the general model for the vocational educational programmes is to undergo two years’ schooling and two years’ apprenticeship in a company, where the second year is regarded to add value to the business. After having completed two years of training, the pupils are also given the opportunity to earn certification for admission to universities and university colleges instead of going for the final two years of apprenticing (Bugge and Wikan 2014).

It turns out that 26% of the pupils who completed the second year of the two-year vocational education programme opted to attend this additional third year programme for general studies rather than going for the final two years of apprenticing. This resulted in having 41% of pupils in Norwegian upper secondary schools in 2013/2014 attend vocational programmes (Digre and Haugberg 2014, 23), whereas the remaining 59% attended programmes for general studies. These figures demonstrate how the vocational teacher education prepares students for educational programmes involving a little less than half of all the pupils in upper secondary schools.

The vocational teachers’ academic background and the professional experience they have gained in their working life give them a unique position in the school system, as they are able to turn real-life relevant vocational technical tasks into comprehensive learning tasks for the pupils. The Norwegian model of a three-year vocational teacher training, EQF level 6, requires a solid vocational background, with many years of practice in the professions they are training their students in. This is in contrast to the German vocational schools, where the vocational teachers function as placement tutors in workshops, which means they are not responsible for the vocational education at large. Thus, in the Norwegian context, the vocational discipline, which includes didactics and pedagogy, is an important part of their training, constituting 1/3 of the programme.

During this 1/3 of the programme they transfer their experience from previous practice, and thus evolve into teachers - through an academic paper focussing on consistency and coherence in

their work with acquiring pedagogical, as well as didactic, knowledge and skills, and also through the lessons and training they carry out in their own vocational classes.

### *Pedagogical learning tools*

The most important learning tools in our technological learning workshops are LEGO Mindstorms (Bender 2010, 172) and additive manufacturing tools (Scott et al. 2012); we are also planning to acquire additional technological equipment targeting vocational programmes other than the one we have chosen to focus on here. In this paper, however, we will only present the two pedagogical tools we have studied in practice in Technical and Industrial Production, as well as electricity and electronics, classes - two of a total of nine different vocational programmes.

#### *LEGO Mindstorms*

In 1985, Resnick, Ocko and Papert (1988) launched the development of a new concept, based on Papert’s (1993) LOGO, in order to program LEGO constructions as part of a process of developing new learning tools (Resnick 1997, 25). This led to collaboration between the LEGO Group and two research groups at the Massachusetts Institute of Technology (MIT) - MIT’s Epistemology and Learning research group, and MIT Media Laboratory (Mindell et al. 2000). What is interesting here, from a learning perspective, is that the development of LEGO Mindstorms is based on epistemology and learning; and through developing this learning tool, the MIT scientists attempted to create new constructivist approaches towards learning. In addition, the LEGO Group also wanted to spread a constructivist approach towards learning, and to have LEGO become the world’s strongest brand among families with children (Mortensen 2014).

The LEGO Mindstorms learning tool contains two different elements; one of them is the physical LEGO pieces, including engines, sensors, and the programmable control unit, named as RCX from 1998, NXT from 2006 or EV3 from 2013 (2014), all of which have been developed by the LEGO Group. The second element of LEGO Mindstorms is the computer program used to program the control unit, which is an application used on a stationary computer or a laptop. LEGO Mindstorms continues to have two different versions on the market; one targeting the commercial toy market, and the second customised for the educational field. What we call Lego Mindstorms throughout this article is actually termed “LEGO Mindstorms Education”.

The programming tool associated with Lego Mindstorms Education is based on the computer system LabView by National Instruments (NI 2011), which is a computer system developed for controlling and monitoring automated production processes. LEGO has used one version of LabView for programming the control unit for LEGO Mindstorms, and then developed their own graphical user interface on top of LabView. Hence, those programming LEGO Mindstorms encounter LEGO’s own user interface, but are really programming using the LabView programming tool. It is precisely this close connection between LEGO Mindstorms and software used in the technology industry that makes this learning tool particularly interesting for the vocational teacher education for technical subjects.

#### *Additive Manufacturing*

Additive manufacturing may be defined as: “The process of joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing technologies” (Harris 2011). Additive manufacturing is a further development of what was known in the latter 1980s as rapid prototyping; a method enabling you to produce prototypes of products much faster. Additive manufacturing is currently regarded as an entirely digital manufacturing process without the traditional machining processes that remove materials from the object. The manufacturing process is automated, performed by computer-controlled machines that build models layer by layer in the desired material.

Additive manufacturing does not only signify units for manufacturing three-dimensional objects, usually termed 3D printers, but also the software for drawing these objects on a computer,

as well as units for scanning three-dimensional objects - 3D scanners. By combining 3D scanners and 3D printers, you actually wind up with 3D copiers; and by using 3D software you can modify the scanned objects prior to production.

Over the past 20 years, 3D printers have evolved from simple machines that were technically difficult to operate and only able to manufacture simple models of a product (Allison and Scudamore 2013), to today's additive manufacturing technology, which is easy to use and may produce objects with mechanical properties that are actually usable. Today's 3D printers construct objects in many different polymers (plastic) and metals (Harris 2011).

In order to further the technological development in Europe, both scientists and industrial leaders suggest that additive manufacturing should be a technological priority area (Allison and Scudamore 2013). Future vocational teachers should therefore be prepared for these developments by gaining knowledge, skills and general expertise in additive manufacturing and the on-going developments of this technology in the academic and working life.

In this study, we have focussed on the use of basic and relatively inexpensive 3D printers for plastics. Due to the low cost, 3D printers of this type have quickly become common in the vocational education and training (VET) programmes in Norwegian secondary education. Introducing this technology to vocational teacher students is thus exceedingly relevant, and will answer the needs of the labour market of the future (Allison and Scudamore 2013). This technology is new, and there will be need of pedagogical and didactic developments in many areas relevant to our vocational teacher students, who may participate in the development of methods, teaching materials and comprehensive learning tasks.

### ***A technological learning workshop***

Teknologisk Læringsverksted Kjeller (TLK) (“Kjeller Technological Learning Workshop”) has classrooms in the shape of practical workshops, equipped with LEGO Mindstorms and additive manufacturing equipment as key learning tools. The layout of the room is based on a previous research project featuring a mobile classroom, which was designed to pique the interest of children and adolescents in technology and engineering (Brevik 2007; Haukeland 2003). The room has been equipped with eight roundtables seating three pupils/students each, and two larger tables for carrying out projects. The room has also been equipped with audio-visual equipment such as a SmartBoard and several large screens displaying the SmartBoard contents. Each of the eight roundtables has a desktop computer, all of which may display their contents on the big screens. In addition, the room is equipped with cameras, microphones and loudspeakers for lessons via Skype, Hangout, AdobeConnect, etc., in order to allow for the use of new technologies for communication between the educational institution and the vocational teacher students (Karstensen 2014).

The learning theory from which TLK has been developed, which is based on Papert's (1980) constructionist theory on learning, is meant to enable vocational teacher students to try out, and develop, learning tasks of their own that may be applied to vocational study programmes. The idea is to have students visit a technology enterprise, or a company using technology-based work processes in their production, and have them identify various technological issues there. They would then describe these issues before moving on to simulating solutions to them, using LEGO Mindstorms and/or additive manufacturing as learning tools.

### ***Papert's constructionist theory on learning***

The theoretical framework for the analysis of the empirical data in this article is based on Papert's constructionist theory on learning. Papert's theory on constructionism builds on Piaget's theory on knowledge development among children - constructivism; hence the similar-sounding terms. Constructionism can be said to be a concretisation of Piaget's theory, and the two theories describe two different phenomena. The difference lies in how Piaget's theory is a theory dealing with knowledge development, whereas Papert's theory deals with learning and teaching (Kafai 2006, 35). Papert himself describes the difference as follows:

“Constructionism - the N word as opposed to the V word - shares constructivism's connotation of

learning as “building knowledge structures” irrespective of the circumstances of learning. It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it’s a sand castle on the beach or a theory of the universe.” (Papert and Harel 1991, 1).

Papert’s constructionist learning theory - or, as some choose to term it, learning philosophy - may also be described as follows: “The simplest definition of constructionism evokes the idea of learning-by-making...” (1991, 6), which implies two ways of understanding the term “construction”. On the one hand, it may be understood to mean a construction or development of the learning subjects’ (pupils’/students’) mental capabilities, and on the other hand, it may be understood in terms of how the learning subjects construct a physical object. In Papert’s vision, the two types of construction are intertwined; the construction of knowledge among pupils develops as they build personally meaningful artefacts; and both forms for construction are meaningful for the pupils (Kafai and Resnick 1996, 1).

In the present context, “meaningful artefacts” is understood as something that corresponds with reality. This means that vocational teachers are supposed to facilitate learning tasks where the pupils construct meaningful artefacts related to the profession they are training for. Using 3D printers, they manufacture products like gear systems or various forms for brackets; not models of Tyrannosaurus Rex. In the same way, pupils use LEGO Mindstorms to construct technological artefacts that are meaningful with regard to the profession they are training for, such as simulations of automatic sorting systems, and not “fighter robots”.

## **Research methodology**

The results presented in this paper either derived from two different surveys, one conducted by Brevik alone, and the other of Brevik and Holtet together. Method description will therefore be twofold, focusing on the past where both authors are involved.

### ***Study I***

The study dealing with how Electricity and Electronics teachers use LEGO Mindstorms as a learning tool in Norwegian upper secondary schools (Brevik 2014), was carried out as a tripartite study consisting of a pilot project, a qualitative interview survey and an implementation project where the use of LEGO Mindstorms in lessons was tested in a school setting.

The collection of data in the pilot project was conducted through participating observation (Fangen 2010), where two teachers tested the pedagogical tool on their own class (Brevik, Sjøberg, and Tarrou 2008). The results from the pilot project formed the basis for the planning of the study’s implementation project, which also contained participating observation; additionally, it consisted of two qualitative follow-up interviews. The interview survey, with ten informants, was carried out at five different upper secondary schools (Kvale and Brinkmann 2009), one of these being the school where the project implementation part had been carried out. The data was collected over a three-year period, from the fall of 2007 to the spring of 2010, and may thus be considered to be a longitudinal study.

### ***Study II***

The second study we use data from was carried out in 2013 as a qualitative study with three informants (Kvale and Brinkmann 2009). These three belonged to an upper secondary school, a business/company and a university college, respectively, all located in Oslo or the surrounding areas. Our selection criteria included experience in the use of 3D printers, either as a tool in the manufacturing process and/or as a pedagogical tool for pupils, apprentices and students.

The interview-based survey was based on open-ended explorative interviews where we had put down a few tentative questions in advance. The first two questions asked why the company had acquired the 3D printers, and whether they had any clear purpose for this acquisition. The second question asked how the users of the equipment had been trained; whether they had taken part in internal or external courses, or if the individual users had been mostly self-taught. The next four

questions dealt with whether the use of 3D printers in the company was rooted in the other activities of the company, whether the acquisition was a part of developing the company, or whether the acquisition had changed the way the company worked. In order to specify the purposes these institutions used 3D printers for, we asked whether they could offer any practical examples of what they used 3D printers for in their own institution, and whether they could envision other uses in the future. Seeing as we were planning to purchase 3D printers of our own, we asked them which kind of 3D printers they had acquired, and what their experiences with them were.

Since this interview guide was designed for both businesses and educational institutions, we added two questions targeting informants involved with teaching in schools. The first of these questions was how the informants used 3D printers for teaching purposes; the second question was about whether they had integrated use of 3D printers in teaching programmes in which they had not previously used such equipment.

All three interviews were carried out at their individual working places, and both the authors of this article were present during all the interviews. The interviews were recorded on tape, and were transcribed in their entirety for further analyses. The analyses of the collected data were carried out with the data analysis and research software Atlas.ti (Friese 2011; Muhr 2001), using open, axial and selective coding (Charmaz 2014).

The analysis was conducted by our work with the transcribed material line by line, and marked content with meaningful labels / sub categories (Open Coding). After this work we sorted categories in clusters and found the internal relations between the different categories (axial coding). The analysis was completed by that we found some core categories that represent our findings, this by creating some overarching categories as meaningful categories for our clusters (selective coding).

To ensure the quality of how we managed the personal data gained from our three interviews, we opted to send a notification form to the “Norwegian Social Science Data Service” for assessment prior to the interviews. NSD assigned us with project number 33440, and confirmed that the way we managed the collected data was in accordance with the requirements of the Personal Data Act (Personopplysningsloven 2013).

Considering how our selection of three respondents from three different institutions - two from educational institutions and one from the working life the pupils are trained for - was very limited, we may not offer any generalizable insights. One may also question the validity of our results. However, we believe our results are valid and that we can trust the information the informants gave us, as their individual, independent statements were relatively cohesive.

## **Findings**

### ***Study I***

Key findings from Study I include how the teachers find LEGO Mindstorms to be useful in simulating technological work processes when these are inspired by similar technological processes in companies. Another interesting finding is the fact that several teachers felt that using a LEGO based learning tool simulating technological work processes was positive as a tool for fostering creativity and motivation among their pupils (Brevik 2014). Based on these findings, we have chosen to employ the categories “Simulation” and “Creativity” to express the findings of the study that are relevant for our joint investigation.

### ***Study II***

The most surprising finding from Study II is that pupils, apprentices and students all had problems understanding what a computer drawing of a three-dimensional object looks like in real life. For example, the vocational teacher we interviewed said that their pupils “have a particularly difficult time visualising what a drawn object on a flat piece of paper looks like in reality” (Informant 1). The informant from a technology company that trains apprentices described the same phenomenon, saying: “they can zoom in and out on the object in computers with CAD

software, leaving you with no concept of the actual size” (Informant 2). Our third informant described this problem thus: “We try to move away from displaying products on 2D screens or paper. The transition from the more traditional workshop based work to a more digital process has been not entirely without problems” (Informant 3).

This phenomenon, where the pupils fail to understand drawings on paper or the computer, was one of the reasons why the school one of our informants belonged to purchased 3D printers. He expressed this thus: “However, the main objective is to make it easier to make the connection between the design on paper and the physical object” (Informant 1). We choose to sum up this finding through the category “Spatial reasoning”.

Another of our main findings was that the informants regarded the products made by modern 3D printers using polymers for manufacturing various plastic products based on the principles of additive manufacturing, as being more widely useful than previous technologies. Our informant in the technology company said the following about the newest 3D printer technology: “What’s new is that you may also print using materials with mechanical properties, that is, they can have practical uses” (Informant 2). What he meant was that whereas objects made by previous generations of 3D printers were only suitable for illustrating or displaying three-dimensional objects, today’s printers have properties that make them more practically useful. He explained this thus: “You can now get 3D printers using materials giving you not only something to look at; it can also be used” (Informant 2). We choose to apply the summarising category “Usefulness” here.

Our informants also told us that using 3D printers enabled them to design objects that were difficult or impossible to manufacture with traditional production processes. One of the informants expressed this thus: “and components that are otherwise too complex for the student to make within a reasonable amount of time in a conventional workshop” (Informant 3). We have chosen to apply the category “Complexity” to express this.

So what do our informants use 3D printers for? To our question: “Why has your business acquired a 3D printer?” one of the replies was unequivocal, and may be described in the words of one of our respondents: “For making prototypes and that sort of thing” (Informant 1). The informant who worked with students told us the following: “We manufacture prototypes and small batches... you want to see it physically, as a 3D printer may replace casting... manufacturing tools for casting is expensive, and the 3D printer will be cost effective for smaller batches” (Informant 2). Here, the informant representing working life was also clear on the matter: “we use it as a tool for manufacturing prototypes” (Informant 3). Hence, we choose to use “Prototype” as a category to represent our findings.

### ***Summary of results from Study I and Study II***

We may summarise our findings with the following six categories: Simulation, Creativity, Spatial reasoning, Usability, Complexity and Prototype.

### **Conclusions and implications for teacher education**

The subject of our study was: “Developing learning tasks in a technological learning workshop with LEGO Mindstorms and additive manufacturing as the main pedagogical tools”. What we wanted to achieve with this study was to describe how it is possible to develop realistic learning tasks in a school-based learning workshop using two different pedagogical tools - LEGO Mindstorms and additive manufacturing tools.

Results from Study I show that vocational teachers find the use of LEGO Mindstorms to be useful when simulating technologically based processes in the schools’ classrooms and workshops, and that these learning activities foster creativity among the teachers.

Similarly, results from our study on the use of 3D printers in schools and the working life show that this kind of technology is useful for helping pupils, apprentices and students to develop their own capability for spatial reasoning. They do not simply design something on a computer; they are also given the opportunity to build a prototype of their design in a material with good mechanical properties.

The concept of understanding three-dimensional physical objects by looking at digitally constructed three-dimensional drawings on a computer is not new. As early as in 1948, the Piaget team launched the topic in their book *The Child's Conception of Space* (Piaget and Inhelder 1956). Although Piaget's main focus deals with mathematical construction and psychological development, it is interesting to note Piaget's attention to this field considering how our findings indicate something about how pupils understand physical objects based on a mathematical model, which is what a digital model really is.

As mentioned in the introduction, LEGO Mindstorms has been developed by LEGO in collaboration with, among others, MIT's Epistemology and Learning research group, where Seymour Papert researched how children learn. The work he performed at MIT was an extension of a five-year collaboration project Papert had with Piaget at his research institution in Switzerland, and is thus based on Piaget's ideas on how children learn.

So, how may our findings be related to Papert's constructionist learning theory? Here we repeat Papert's own definition: “The simplest definition of constructionism evokes the idea of learning-by-making...” (Papert and Harel 1991, 6). Based on our findings, we claim that both using LEGO Mindstorms and, not least, tools for additive manufacturing, will be a suitable pedagogical tool for facilitating “learning-by-making”.

Using these pedagogical tools will thus make it possible to use real-life professional work tasks as comprehensive learning tasks for pupils in schools, which is a core competence for Norwegian vocational teachers.

The cultivation of the professional identity of the vocational teacher plays a part in this. As described above, these teachers have an identity not only as skilled workers within different areas of expertise, but also as professional teachers due to their three-year vocational teacher education, which is often defined as “the field of double practice” (Tarrou 2005, 213). We regard the professional identity these vocational teachers gain through this field of double practice, being trained as both skilled workers and educators, as an opportunity to transfer experience and knowledge into the schools' learning workshops - and to develop new learning tasks with new pedagogical tools such as LEGO Mindstorms and Additive Manufacturing.

As a consequence of this study, we wish to look further into the “Spatial reasoning” category, conducting a larger survey with more respondents where we question teachers and teacher students about their experiences with this issue. The reason for this is that in the curriculum for Technical and Industrial Production, computer based 3D modelling is an important subject that is allotted a fair amount of time. Hence, we are planning to study the usefulness of using 3D modelling in schools, and how the things the pupils create on computers are made tangible in the form of real products.

## References

- Allison, A. and R. Scudamore, eds. 2013. *Additive manufacturing: strategic research agenda*. United Kingdom: TWI.
- Bender, J. 2010. *LEGO a love story*. Hoboken, New Jersey: John Wiley & Sons.
- Brevik, B. 2007. “Teknologiske arbeidsprosesser inn i grunnskolen: LEGO roboLab som pedagogisk verktøy.” Master, Yrkesfaglærerutdanning, Høgskolen i Akershus.
- Brevik, B. 2014. “LEGO & Læring: en kvalitativ studie av elektrofaglæreres bruk av LEGO Mindstorms som læringsverktøy i norsk videregående skole.” PhD diss., University of Oslo.
- Brevik, B. and A. Roar Lier. 2013. “Technical and Vocational teacher education practice: profession or semi profession?” In *Proceedings of the 37th Annual Conference of ATEE: Teacher Education Policies and Professionalisation*, edited by E. Agaoglu, C. Terzi, C. Kavrayici, D. Aydog, and B. Himmertoglu, 102-109. Brussels: ATEE aisbl.
- Brevik, B., S. Sjøberg, and A-L. Høstmark Tarrou. 2008. “Technology education through open ended teaching strategies associated with practical learning tools.” In *XIII.IOSTE Symposium: The Use of Science and Technology Education for Peace and Sustainable Development*. September 21-

26, 2008, Kuşadası / Turkey.

Bugge, L., and G. Wikan. 2014. “A comparison of kindergarten teacher students: on-campus/full-time versus flexible studies.” In *Educating for the future: Proceeding of the ATEE 38th Annual Conference*, edited by E. Arntzen. Brussels: ATEE aisbl.

Charmaz, K. 2014. *Constructing grounded theory*. 2nd ed. London: SAGE.

Digre, K., and T. Haugberg 2014. *Utdanningsspeilet, kjetil digre*. Oslo: Utdanningsdirektoratet.

EACEA. 2012. Key data on education in Europe 2012. Brussels: Education, Audiovisual and Culture Executive Agency P9 Eurydice.

EQF. 2012. *The European qualifications framework for lifelong learning*, edited by EC.

Fangen, K. 2010. *Deltagende observasjon*. 2nd ed. Bergen: Fagbokforlaget Vigmostad & Bjørke AS.

Friese, S. 2011. *ATLAS.ti 6: user guide and reference*. Berlin: ATLAS.ti Scientific Software Development GmbH.

Glaser, B. and A. Strauss. 1967. *The discovery of grounded theory: strategies for qualitative research*. Chicago: Aldine. Reprint, 2008.

Goodlad, J., M. Frances Klein, and Kenneth A. Tye. 1979. “The domains of curriculum and their study.” In *Curriculum inquiry: the study of curriculum practice*, edited by J. Goodlad, 43-76. New York: McGraw-Hill Book Company.

Harris, I. 2011. *Development and implementation of metals additive manufacturing*. Columbus, OH: EWI.

Haukeland, K. 2003. *Kulere skole: pilotprosjektet teknobuss med utgangspunkt i Ringeriksregionen*. Hønefoss: Ringerike Næringsforum.

Kafai, Y. 2006. “Constructionism.” In *The Cambridge handbook of the learning sciences*, edited by R. Sawyer, 35-46. New York: Cambridge University Press.

Kafai, Y., and M. Resnick, eds. 1996. *Constructionism in practice: designing, thinking, and learning in a digital world*. New York: Routledge.

Karstensen, S. 2014. “Norwegian TVET teachers’ use of new technologies.” In *Educating for the future: Proceeding of the ATEE 38th Annual Conference*, edited by E. Arntzen. Brussels, Belgium: ATEE aisbl.

Kvale, S. and S. Brinkmann. 2009. *Det kvalitative forskningsintervju*. Translated by T. Anderssen and J. Rygge. Oslo: Gyldendal akademisk.

Mindell, D., C. Beland, W. Chan, D. Clarke, R. Park, and M. Trupiano. 2000. *LEGO Mindstorms: The structure of an engineering (R)evolution*. <http://web.mit.edu/6.933/www/Fall2000/LegoMindstorms.pdf>

Mortensen, T. 2014. “The LEGO history.” The LEGO Group, Last Modified 23. [http://aboutus.lego.com/en-us/lego-group/the\\_lego\\_history](http://aboutus.lego.com/en-us/lego-group/the_lego_history)

Muhr, T. 2001. *ATLAS.ti: the knowledge workbench*. Scientific Software Development.

NI. 2011. “National instruments.” National Instruments. <http://www.ni.com/>

Papert, S. 1980. Constructionism vs. instructionism.

Papert, S. 1993. *Mindstorms: children, computers and powerful ideas*. 2<sup>nd</sup> ed. New York: Basic Books. Original edition, 1980.

Papert, S. and I. Harel. 1991. “Situating constructionism.” In *Constructionism*, edited by I. Harel. Ablex Publishing Corporation.

Personopplysningsloven. 2013. *LOV-2000-04-14-31: Lov om behandling av personopplysninger*, edited by Justis- og beredskapsdepartementet. Oslo: Lovdata.

Piaget, J. and B. Inhelder. 1956. *The child’s conception of space*. England: W.W. Norton & Company, Inc.



Resnick, M. 1997. *Turtles, termites, and traffic jams: explorations in massively parallel microworlds*. Cambridge, Massachusetts: A Bradford Book, The MIT Press.

Resnick, M., S. Ocko, and S. Papert. 1988. “LEGO, logo, and design.” *Children’s Environments Quarterly* 5 (4):14-18.

Scott, J., N. Gupta, C. Weber, S. Newsome, T. Wohlers, and T. Caffrey. 2012. *Additive manufacturing: status and opportunities*. Washington, DC: Science and Technology Policy Institute.

Tarrou, A-L. 2005. “Danning i yrkesfagene i skolen og i lærerutdanningen.” In *Fagenes begrunnelser: skolens fag og arbeidsmåter i danningsspektiv*, edited by K. Børhaug, A-B. Fenner, and L. Aase, 213-223. Bergen: Fagbokforlaget.

[Back to contents](#)

## Investigating student teachers’ understanding of multicultural society

*Liv Susanne Bugge & Morten Løtveit*

*Hedmark University College, Norway*

*liv.bugge@hihm.no & morten.lotveit@hihm.no*

### Abstract

In the present article we address methodological considerations with regard to an ongoing study on multicultural awareness among Norwegian student teachers. We will also present some preliminary results. As European schools and kindergartens are characterised by growing diversity, it becomes urgent to prepare student teachers to cope with teaching and learning in a multicultural perspective. In order to develop a deeper intercultural understanding, students need to reflect on their own experiences, and they need a teacher education characterised by a high degree of multicultural consciousness. In the Norwegian National Curriculum Regulations for Teacher Education as well as for Kindergarten Teacher Education, the development of cultural awareness is an important objective. In the present study the following research questions are addressed: What characterises novice student teachers’ multicultural awareness, does student teachers’ multicultural awareness alter during their period of education, and are there differences in multicultural awareness between students with a study period abroad compared to other students. A mixed methods approach is presented, consisting of survey and in-depth interviews. Preliminary findings from our survey indicate that student teachers do not have the same understanding of the concept of cultural background. Implications for teacher education are discussed.

**Keywords:** multicultural awareness; diversity; teacher education; kindergarten teacher education.

### Context of the research

In the article we present methodological considerations as regards an ongoing study on multicultural awareness among Norwegian student teachers. Methodological issues related to a mixed methods approach are discussed, and a study design based on this approach is presented. Questions about response rates and validity are focused. One of the reasons to address multicultural issues is that European schools and kindergartens are characterised by growing diversity. Students and kindergarten children have diverse cultural backgrounds, but at the same time, teachers and student teachers overwhelmingly belong to the dominant culture. This is a consequence of the rise in migration, forced and voluntary, in many European countries during the last decades. As the percentage of diverse students grows, it becomes urgent to make teachers aware of the importance of culture and how it affects teaching and learning (Smith 2009). The curriculum cannot be seen as culturally neutral; it is constructed within a cultural framework. To be aware of this, and to be able to cope with the challenges which arise, student teachers should be trained in multicultural awareness. “Culture is deeply embedded in any teaching; therefore, teaching ethnically diverse students has to be multiculturalized” (Gay 2002, 112). Teachers need to be prepared to work with a culturally and linguistically diverse group of students. They should also be able to prepare students to be culturally aware; this is relevant to all students, whether they belong to a cultural majority or not (Santoro and Major 2012).

The purpose of the article is to highlight methodological considerations concerning the present research project. After presenting the research questions and the theoretical framework a mixed methods approach is introduced and it is explained how this is used to investigate multicultural awareness. The collection of data is accounted for and aspects about reliability are discussed. Multicultural awareness is at the core of the study; hence operationalisation of this concept is discussed and relevant variables presented. Arguments for the use of structured questionnaires in combination with in-depth interviews are examined. Some preliminary findings from our survey will be presented.

## Research questions

To be able to develop teacher education in a direction that will enable student teachers to deal successfully with questions associated with cultural diversity, it is a good starting point to have knowledge about students' ideas about multicultural issues when they begin their education. Choice of efficient learning tools depends on the level of competence of the learners. For example in mathematics there is a tradition for measuring students' knowledge at the start of a new course. Our first research question then is what characterises novice student teachers' multicultural awareness?

As described above, the Ministry of Education and Research aims explicitly to develop student teachers' multicultural competence. Our next research question is: does student teachers' multicultural awareness alter during their period of study? To be able to answer this question we have to compare students' awareness at the start and at the end of teacher education. Methodological considerations will be given attention below.

Hedmark University College offers students the opportunity to have a stay abroad during their third year of education. We will examine whether this stay has an effect on students' multicultural awareness by comparing students who have studied abroad with their fellow students who have stayed at home. Is it possible to identify changes, and, if so, what kind of changes?

To sum up, we have three research questions: What characterises novice student teachers' multicultural awareness? Does student teachers' multicultural awareness alter during their period of study? Are there differences between the multicultural awareness of students with a study period abroad and other students?

## Theoretical framework

To become reflective teachers in the multicultural classroom knowledge in three different areas is required. Obviously, teachers have to be well prepared in pedagogy and practice, they must know their students and, furthermore, they must have knowledge of themselves. These requirements are complex and consist of many sub-categories, some of them interrelated (Santoro 2009). As regards the second item, in what way teacher education can prepare students so they will be able to know their coming pupils, this obviously involves basic competence about getting to know persons from other cultures than their own. Student teachers should get the fundamental idea that people with another cultural background are more alike than unlike themselves, and at the same time that people who belong to one culture are all individuals, and hence different from each other. It is unproductive to underline the difference between “us” and “the others”; we are all “ethnic”. As Santoro (2009) points out, culturally diverse students should neither be seen as “problems” to be “managed”, nor as exotic and “colourful”.

As society becomes more culturally diverse, intercultural communication competency at the individual level is demanded (Fritz, Möllenberg, and Chen 2002). There is a notable difference between demonstrating a general open-mindedness towards cultural diversity and showing a sophisticated understanding of the varieties and complexities of interaction in multicultural settings. In order to develop a deeper intercultural understanding, student teachers need to reflect on their own and their companions' experiences and they need to relate their reflections to a variety of theoretical frameworks. At the institutional level multi/intercultural education is not a matter of course in the routines of schools. In European teacher education structural actions have been lacking, leading to insufficient competencies to work effectively in heterogeneous and culturally diverse contexts (Tarozzi 2014). The tendency that culturally diverse students underachieve educationally is well documented (Chu 2011). They are disempowered educationally, which could be seen as a parallel to the way their communities have been disempowered historically (Cummins 1997).

There is, therefore, clearly a need for multicultural education. However, there is apparently no common understanding of what multicultural education should look like. Multicultural education has complex multidisciplinary roots, as is clearly demonstrated by Bennett (2001). In a study from the United States it is also found that teachers emphasize different aspects of the

multicultural curriculum (Sleeter 2004). According to Özturgut (2011, 2) “...there is no clear and agreed definition of what we understand from “multiple education” but a variety of context-specific definitions.” However, in his analysis of syllabi in multicultural teacher education, Gorski (2009) finds that most of the syllabi prepared teachers with cultural sensitivity, tolerance and multicultural competence, but failed to frame aspects of social justice.

In Norway, we have seen a rise in immigration during recent decades. Schools and kindergartens are no longer monocultural; diversity has become part of everyday life. In 2014 12% of the Norwegian population is immigrant (Statistics Norway 2014). Each year Statistics Norway (the Central Bureau of Statistics) conducts a survey on attitudes towards immigrants and immigration. From this, as well as other studies, we know that attitudes towards immigrants vary according to different background factors, among them education. Generally, the acceptance of immigrants is greatest among persons with higher education (Blom 2013).

It is against this background we are conducting a study on multicultural awareness among Norwegian student teachers. In the Norwegian National Curriculum Regulations for Teacher Education as well as for Kindergarten Teacher Education, the development of cultural awareness is an important objective (Ministry of Education and Research 2014). In The National Guidelines for Kindergarten Teacher Education it is underlined that kindergarten teachers must have knowledge about the development of children in a society characterised by linguistic, social, religious and cultural diversity (Ministry of Education and Research 2012). The corresponding guidelines for teacher education state that “Teachers must have knowledge about and an understanding of the multicultural society. This entails awareness of cultural differences, and skills in treating these as a positive resource.” (Ministry of Education and Research 2010, 9, our translation). The Ministry of Education and Research concludes by saying that primary and lower secondary teacher education programmes must therefore be characterised by a global, international and multicultural orientation.

In Norwegian Teacher Education the ambition is that students should gain knowledge and be stimulated to reflect on issues related to cultural diversity. As Santoro (2009) points out, the skills of reflection should be taught to student teachers. But not only knowledge and skills matter. According to Nichols and Dong (2011), teachers have to possess the desire to do the best for all their students, regardless of cultural belonging. Educational intervention, defined as multiculturalism, multicultural education or multicultural pedagogy, aims both at recognising what is common and what is different between two or more cultures (Portera 2008).

Studies confirm that courses in multicultural education could increase levels of awareness of cultural diversity among pre-service teachers (Aquah and Commins 2013). In our study, however, we have a broader approach. We will not study the effects of particular courses, but whether changes take place in students’ multicultural awareness after years of study at an institution that in its intentions and attitudes seeks to promote such changes. We will also examine to what extent findings from our own institution are in accordance with general tendencies among the Norwegian population at large and among the Norwegian student population in particular.

According to Deardorff (2011) it is necessary to define intercultural competence and develop measurable learning outcome statements in order to graduate students ready for the global world. She underlines the importance of developing realistic objectives. In Norway there is not much tradition for measurable learning goals in the field of multicultural education. In our study students’ attitudes will be central, and we will also focus on students’ experiences and on their understanding of culture and how culture influences human behaviour. In Norwegian teacher education, students have the option of a one-semester stay abroad, and we will also investigate whether students’ stay abroad has an impact on their approach to cultural diversity. Studies show that exchange students are motivated to study abroad because they want to develop cultural, professional and personal competence (Leutwyler and Meierhans 2013). In a case study, Marx and Moss (2011) found that teacher education studies abroad can lead student teachers towards an ethnorelative worldview and a corresponding culturally responsive approach to teaching. Furthermore, this is in accordance with the findings in an Australian study; a study abroad programme for teacher education students contributed to the development of a positive and more differentiated understanding of the local

people than the more stereotypical view the students arrived with (Hill and Thomas 2005).

### **Research methodology**

Most educational research tends to be either qualitative or quantitative, even though a combination of the approaches could generally be expected to give deeper understanding and higher validity. According to Baranowska-Rataj, Matysiak, and Mynarska (2013), using different approaches, as well as different methods and data sets, allows us to formulate deeper and more valid interpretations of social phenomena. The increased interest in mixed methods is due to researchers' beliefs that by complementing qualitative with quantitative methods they can improve the validity of their research (Alasutari 2010). In a comprehensive article on mixed methods research, Teddlie and Tashakkori (2012) introduce common characteristics of mixed methods. One of them is methodological eclecticism, which means that researchers applying mixed methods use techniques that encompass all the “toolboxes” of qualitative and quantitative approaches. Mixed methods techniques are used in several research fields, from strategic planning (Voorhees 2008) to education (Hardré et al. 2013; Markic and Eilks 2011).

Triangulation of methods is recommended, but its application is of course a question of resources. Generally, the more different methods for data gathering that are used, the more time-demanding the project will turn out to be. However, the use of more than one methodological approach normally enriches research projects.

In our study a mixed methods approach is used in order to investigate students' multicultural awareness. Step one is to administer a survey with structured questionnaires; step two is to interview a sample of students. The order of the approaches used is not obvious. In our case we have decided first to get an overview of some basic traits of the students' multicultural awareness by collecting quantitative data, and then to take advantage of the possibility of going deeper into some of the themes.

A mixed methods approach could raise ethical issues when a qualitative component is integrated into a survey research project. According to Leahey (2007) problems concerning confidentiality of respondents are often overlooked when the studies require linked qualitative and quantitative data. Many researchers start their study with secondary survey data, and if they then wish to add a qualitative component linked to the survey data, this is not possible due to reasons of confidentiality. “Either the researchers must be involved in the original collection of survey data, or they must have access to geographical, personal, or other unique identifiers to collect additional qualitative data from the research site or original research participants.” (Leahey 2007, 151). In our case we have collected original survey data; hence we can have a sample taken from the survey participants for the qualitative part of the study.

We firstly introduce the quantitative and then the qualitative part of the study. Quantitative data was gathered using structured questionnaires. All first year student teachers at Hedmark University College have been invited to participate. This data collection makes the basis for answering the first research question: what characterises novice student teachers' multicultural awareness? When these students are in their third year of teacher education we will administer another questionnaire, designed to grasp possible changes in multicultural awareness.

The current questionnaire was administrated in September 2014. Thus the sample was taken among students who are in the beginning of their first semester of teacher education. This is important; we wanted to get an understanding of respondents' cultural awareness before they were influenced by the institution of teacher education. Questionnaires were administered during compulsory lecture time. Nearly all students present completed the questionnaires, which were collected immediately. The researchers administered the data collections.

The respondents are students at Hedmark University College, Faculty of Education and Natural Sciences. They attend the Teacher Education Programme (181 students) or Kindergarten Teacher Education Programme (207 students); hence in total 388 students completed the questionnaire.

The total response rate is 90%-88% for Teacher Education students and 92% for

Kindergarten Teacher Education students. Response rates are crucial to the quality of studies. Low response rates reduce a study’s reliability. The actual response rates are high compared to other studies, and the significance of the findings is strengthened correspondingly. As nearly all students present have completed the questionnaire the consequences of missing students are regarded as being small. Even if those who were not present when the questionnaires were administered, or chose not to fill in, differ systematically from the others in some way relevant to the research topic, this may not influence the results significantly as they were so few. This is important, as we are unable to tell whether the non-attendance is systematic.

When designing a questionnaire it is imperative to assure the validity. In the present study the core concept is multicultural awareness, and the importance of finding good indicators is obvious. As a first step we have to identify underlying factors which together build up the principal concept of multicultural awareness. In our study we operationalise multicultural awareness in terms of six factors: interaction with immigrants, attitudes towards immigrants, general ideas about cultures and cultural diversity, preferences about one’s own future relations with immigrants, knowledge about immigrants’ situation in Norwegian society and views on some specific issues from the current debate on cultural diversity in Norway. As regards interaction with and attitudes towards immigrants it is not difficult to find studies which use different indicators. At this point we have chosen partly to lean on a representative national survey conducted every year measuring Norwegians’ attitudes towards immigrants and immigration (Blom 2013). Inspired by this study we ask the respondents if they have immigrant friends or relationships with immigrants at work, study, in the neighbourhood or in the family. To study attitudes we ask the respondents to judge statements about immigrants and working life, immigrants and cultural life in Norway and whether immigrants should strive to become as like Norwegians as possible. In these areas we will be able to compare our data with national findings.

Culture is a key concept in our study. At this point we have chosen to ask an open-ended question: “Can you describe in your own words what you mean by culture?” We want to get insight into students’ own understanding of the concept of culture. Open-ended questions imply a different and more time-consuming way of data-analysis than questions with fixed alternatives for answering, but this way of posing questions can also give a deeper insight. By formulating an answer in their own words the students may expose far more of their ideas about culture than by just ticking off one among several prefixed alternatives.

Besides asking for the respondents’ own thoughts about the concept of culture, we have also posed several questions about specific aspects of culture. How do students describe differences between people with diverse cultural backgrounds? What is emphasised? Other questions are designed to reveal thoughts about the relation between culture and values, whether a culture is regarded as stable or dynamic, or to what extent and for how long humans are influenced by the culture in which they were raised. The respondents are also asked to tell whether they think it is important to learn about (other) cultures.

As regards thoughts about the future we have posed three questions. First we ask whether the respondent would like to go abroad for work or study at least for half a year in a country outside Western Europe. Personal obligations could of course matter, but in total we think this question could show some tendencies on openness towards other cultures. The second question is whether the respondent would like to work in a kindergarten or school where the majority of the children have immigrant backgrounds. There are several answering alternatives, so we think this question will give us important information about the respondents’ attitudes to working in multicultural environments. The last question in this section is a hypothetical one. What would you think if your child got a main teacher with immigrant background (supposing the teacher had adequate knowledge in Norwegian)? By combining these questions we hope to be able to broaden our picture of the students’ ideas about and attitudes towards multicultural society.

Attitudes towards immigrants may be related to education. Acceptance of immigrants tends to be greatest among highly educated people (Blom 2013). To what degree this has to do with knowledge is not easy to tell. Nevertheless, lack of knowledge is a relevant issue, also for student teachers. According to Brown (2011) American teacher candidates enter teacher education with

unsufficient knowledge about racism, and hence teacher education should offer students coursework and experiences needed to address this. Even if the position of immigrants in society differs between countries, the general impression is that in many cases successful integration seems difficult to obtain. Marginalisation of immigrants is well documented (Kaida 2013, Richards 2004). According to a Danish study, well-developed welfare states are no exceptions in this regard (Nannestad, Svendsen, and Svendsen 2008). To reveal student teachers’ knowledge about immigrants, we ask the respondents what they think about immigrants’ economic conditions, degree of political influence and whether immigrants are discriminated against in Norway. These areas are selected because the themes are strictly related to the position of immigrants in society.

To gain insight into students’ multicultural awareness we are also interested in their views on some specific issues from the current debate about cultural diversity in Norway. The use of niqab, attending swimming lessons in school and the use of Christian symbols for news reporters on television are all themes currently debated. Respondents’ views on these themes may give us insights into student teachers’ views on sensitive aspects of a multicultural society.

The questionnaire includes the following background variables: sex, age, knowledge of second languages, parents’ education and stream and grades from upper secondary school. We have also asked about the respondents’ contact with immigrants. At this point we are able to compare with national data. The analysis will be carried out spring 2015 by the use of SPSS (Statistical Package for the Social Sciences).

The qualitative part of our study consists of unstructured interviews. In an unstructured interview the object is not to elicit choices between answers to questions already formulated, but to elicit what the respondent considers to be important questions relative to the topic (Lofland 1971). The interview situation should be characterised by flexibility. As already mentioned this part of the study will be carried out as a second step. Then we can take advantage of findings from the survey when developing an interview guide. A small sample of students will be arbitrarily selected for an in-depth interview. New topics related to the above-mentioned themes will be developed, and questions relating to other relevant themes will also be raised. Most importantly, the interviews will document the students’ own considerations formulated in their own words.

Particular topics emerging in the survey will be of special interest for the qualitative part of the study. For example, three items in the questionnaire will provide important information about the respondents’ contact with immigrants. With in-depth-interviews we will have the possibility of understanding the characteristics and qualities of the relationships in a far more comprehensive way. Another section in the questionnaire asks the respondents to evaluate statements about immigrants in Norway. In an interview these statements can be discussed in a more encompassing way; the respondents get a chance to be far more detailed and reflective.

Hence, findings from the survey will serve as important starting points for developing an interview guide, but the interviews will be allowed to proceed in many different ways. Hopefully this part of the study will result in detailed and enriching materials, which in turn will contribute to the understanding of a complex topic.

## Findings

A particularly interesting research theme in our study of student teachers’ multicultural awareness is how they understand the concept of cultural background. We asked the respondents what they primarily had in mind when referring to people with a cultural background different from theirs. The respondents were given the following answering alternatives: a) people who look different; b) people who have a different standard of living than I am accustomed to; c) people who behave and express themselves in ways that I am not familiar with; or d) something else. The respondents were given the opportunity to elaborate if they had chosen the last alternative.

It is worthwhile to underline the word primarily, which means that respondents must choose one alternative. We are aware that the answering alternatives are not mutually exclusive, but our intention is to highlight what the respondents regard as the most important aspect of someone’s cultural background.

Among the respondents 11% prefer the first alternative, emphasising what people look like. Standard of living is chosen by 34%, while the most preferred answering alternative is how people behave and express themselves. This alternative is chosen by 47%. Only 9% tick off on the something else alternative.

Interestingly, nearly half of the respondents emphasise how people behave and express themselves. This view could be seen as compatible with a number of scholarly understandings of the concept of culture. One of three respondents accentuate a different standard of living as the most important aspect. While we cannot be certain, some of these respondents may think about people with a different cultural background as people who have immigrated from the third world, and have had a difficult economic starting point. The degree of social consciousness related to this issue may differ among the respondents. Have some of the students developed what scholars call a critical multicultural awareness (Castro 2010; Iverson 2012)? This is one of many themes that will be explored in our coming interviews with some of the respondents. In any event, it is interesting that so many respondents regard a socioeconomic criterion as fundamental for the understanding of cultural difference.

Among the respondents 11% regard what people look like as most central. This alternative may be understood to refer to a number of different phenomena, like skin colour, hair style and clothing. At this stage, it is impossible to know what have been uppermost in the minds of the students that chose this alternative. It is important to notice that 90% of the respondents do not believe that what people look like should be regarded as the most important aspect of people's cultural background. In the interviews we will explore different understandings regarding the relationship between appearance and culture.

The last answering alternative (something else) is chosen by 9%. Here the respondents were given the opportunity of formulating their own answer. These answers differ to such a degree that it is not expedient to analyse them in this article. What we consider most interesting with regard to the preliminary findings presented here is the variety of the respondents' answers. When different student teachers think about cultural background they have different social phenomena in mind.

## **Conclusions and implications for teacher education**

In the article an ongoing study of student teachers and cultural diversity is presented. Background and research questions have been introduced, and methodological considerations have been discussed. The backdrop of the study is the development of multicultural, multilingualistic and multireligious societies in Europe. Several factors have been discussed to highlight the relevance of this societal change to the content of teacher education. The research questions are about novice student teachers' multicultural awareness, whether student teachers' multicultural awareness alter during their three years period of education and if a study period abroad leads to a more comprehensive multicultural awareness than would otherwise be the case. These are important issues for teacher education in a multicultural society.

In the article, methodological aspects have been emphasised. The advantage of combining qualitative and quantitative approaches has been underlined. In this study a structured questionnaire is combined with in-depth interviews, the latter giving the respondents the possibility to be more detailed and reflective.

Indicators of multicultural awareness used in the questionnaire have been presented and discussed. The quality of the indicators is important to assure validity in quantitative studies. As the response rates are high compared to other studies, the significance of the findings is strengthened.

The preliminary findings presented in this article indicate that student teachers have diverse understandings of cultural difference. About half of them emphasise behaviour and ways of expression while one of three underline standard of living. Few student teachers accentuate appearance. This means that we cannot assume that everybody understands the same by the concept of cultural background.

In our study we examine Norwegian student teachers' knowledge and attitudes towards the multicultural society. Novice student teachers considerations are analysed, and so is the impact of



three years of teacher education with regard to this theme. Multicultural issues have been dealt with in Norwegian Teacher Education for years, but knowledge about student teachers multicultural competence at their starting point in higher education is scarce. To be able to address these topics in a successful way, it is valuable to know more about the students’ point of departure.

The study also tries to reveal the eventual impact of three years of teacher education on students’ understanding of multicultural society. The analysis is expected to result in findings that could be seen as relevant with regard to improvements in teacher education.

During recent years it has become common in teacher education to offer the students a semester abroad during their period of study. One of the reasons for this arrangement is a belief that a stay abroad for some months will lead to a deeper multicultural understanding. Living and working in kindergarten or school together with people from a different cultural background is expected to increase students’ multicultural awareness. In our study students with and without a semester abroad will be compared according to questions related to cultural diversity.

The discussion of the preliminary findings suggests a need for paying attention to how student teachers understand ordinary concepts in multicultural societies, such as for example cultural background. We cannot without further ado assume that there is a common understanding among teacher educators and student teachers of the meanings of such terms. One among a variety of teaching approaches may therefore be to explore how students understand the vocabulary we use in multicultural education, and not at least to discuss the meanings of different terms. Perhaps such an approach could prove useful in highlighting both various attitudes towards cultural diversity and different ideas about how multicultural society works? In any event, meaningful improvements in multicultural teacher education require empirically based arguments. Findings from this study could be useful in the ongoing development of teacher education.

## References

- Alasuutari, P. 2010. “The rise and relevance of qualitative research.” *International Journal of Social Research Methodology* 13 (2): 139-155
- Aquah, E., and N. Commins. 2013. “Pre-service teachers’ beliefs and knowledge about multiculturalism.” *European Journal of Teacher Education* 36 (4): 445-463.
- Baranowska-Rataj, A., A. Matysiak, and M. Mynarska. 2013. “Does lone motherhood decrease women’s happiness? Evidence from qualitative and quantitative research.” *Journal of Happiness Studies*. 22 October. <http://link.springer.com/article/10.1007%2Fs10902-013-9486-z>
- Bennett, C. 2001. “Genres of research in multicultural education.” *Review of Educational Research* 71 (2): 171-217.
- Blom, S. 2013. *Holdninger til innvandrere og innvandring 2013*. Statistics Norway. Reports 64/2013.
- Brown, K. 2011. “Breaking the cycle of sisyphus: social education and the acquisition of critical sociocultural knowledge about race and racism in the United States.” *The Social Studies* 102 (6): 249-255.
- Chu, S.-Y. 2011. “Perspectives in understanding the schooling and achievement of students from culturally and linguistically diverse backgrounds.” *Journal of Instructional Psychology* 38 (3/4): 201-209.
- Cummins, J. 1997. “Cultural and linguistic diversity in education: a mainstream issue?” *Educational Review* 49 (2): 105-114.
- Deardorff, D. 2011. “Assessing intercultural competence.” *New Directions for Institutional Research* 149: 65-79.
- Fritz, W., A. Möllenberg, and G.-M. Chen. 2002. “Measuring intercultural sensitivity in different cultural contexts.” *Intercultural Communication Studies* XI (2): 165-177.
- Gay, G. 2002. “Preparing for culturally responsive teaching.” *Journal of Teacher Education* 53 (2): 106-116.

- Gorski, P. 2009. “What we’re teaching teachers: an analysis of multicultural teacher education coursework syllabi.” *Teaching and Teacher Education* 25:309-318.
- Hardré, P., L. Chen, R. Shehab, M. Nanny, M. Nollert, H. Refai, C. Ramseyer, J. Herron, and E. Wollega. 2013. “Teachers in an interdisciplinary learning community: engaging, integrating and strengthening K-12.” *Journal of Teacher Education* 64 (5): 409-425.
- Hill, B., and N. Thomas. 2005. “Making sense of Bali: unintended outcomes of study abroad programs.” *Teaching Education* 16 (3): 197-211.
- Kaida, L. 2013. “Do host country education and language training help recent immigrants exit poverty?” *Social Science Research* 42 (3): 726-741.
- Leahey, E. 2007. “Convergence and confidentiality? Limits to the implementation of mixed methodology.” *Social Science Research* 36 (2007): 149-158.
- Leutwyler, B., and C. Meierhans. 2013. “Exchange students in teacher education. Empirical Evidence on Characteristics and Motive Structures.” *Educational Research* 4 (1): 1-11.
- Lofland, J. 1971. *Analyzing Social Settings*. Belmont: Wadsworth Publishing Company.
- Markic, S., and I. Eilks. 2011. “A Comparison of Student Teachers’ Beliefs from Four Different science teaching domains using a mixed methods design.” *International Journal of Science Education* 34 (4): 589-608.
- Marx, H., and D. Moss. 2011. “Please mind the culture gap: intercultural development during a teacher education study abroad program.” *Journal of Teacher Education* 62 (1): 35-47.
- Ministry of Education and Research. 2010. *Nasjonale retningslinjer for grunnskolelærerutdanningen 1. -7. trinn*. [http://www.regjeringen.no/upload/KD/Rundskriv/2010/Retningslinjer\\_grunnskolelaererutdanningen\\_1\\_7\\_trinn.pdf](http://www.regjeringen.no/upload/KD/Rundskriv/2010/Retningslinjer_grunnskolelaererutdanningen_1_7_trinn.pdf)
- Ministry of Education and Research. 2012. *Forskrift om rammeplan for barnehagelærerutdanning*. 16 September. [http://www.regjeringen.no/upload/KD/Rundskriv/2012/Forskrift\\_rammeplan\\_barnehagelaererutdanning.pdf](http://www.regjeringen.no/upload/KD/Rundskriv/2012/Forskrift_rammeplan_barnehagelaererutdanning.pdf)
- Ministry of Education and Research. 2014. *Rammeplaner for høyere utdanning*. 13 April. [http://www.regjeringen.no/nb/dep/kd/tema/hoyere\\_utdanning/rammeplaner.html?id=435163](http://www.regjeringen.no/nb/dep/kd/tema/hoyere_utdanning/rammeplaner.html?id=435163)
- Nannestad, P., G. Svendsen, and G. Svendsen. 2008. “Bridge over troubled water? Migration and social capital.” *Journal of Ethnic and Migration Studies* 34 (4): 607-631.
- Nichols, M., and E. Dong. 2011. “Meeting the needs for today’s multicultural classroom: a review of literature.” *The Journal of Multiculturalism in Education* 7:1-7.
- Özturgut, O. 2011. “Understanding multicultural education.” *Current Issues in Education* 14 (2): 1-10.
- Portera, A. 2008. “Intercultural education in Europe: epistemological and semantic aspects.” *Intercultural Education* 19 (6): 481-491.
- Richards, A. 2004. “Progressive failure: government, unions and the continuing marginalisation of immigrants in Spain.” *South European Society and Politics* 14 (4): 469-485.
- Santoro, N. 2009. “Teaching in culturally diverse contexts: what knowledge about “self” and “others” do teachers need?” *Journal of Education for Teaching: International research and pedagogy* 35 (1): 33-45.
- Santoro, N., and J. Major. 2012. “Learning to be a culturally responsive teacher through international study trips: transformation or tourism?” *Teaching Education* 23 (3):309-322.
- Sleeter, C. 2004. “Critical multicultural curriculum and the standards movement.” *English Teaching: Practice and Critique* 3 (2): 122-138.
- Smith, E. 2009. “Approaches to multicultural education in preservice teacher education. Philosophical frameworks and models for teaching.” *Multicultural Education* Spring: 45-50.
- Statistics Norway. 2014. *Innvandrere og norskfødte med innvandrereforeldre, 1. January 2014*. <http://www.ssb.no/innvbf/>

Tarozzi, M. 2014. “Building an “intercultural ethos” in teacher education.” *Intercultural Education* 25 (2):128-142.

Teddlie, C., and A. Tashakkori. 2012. “Common “core” characteristics of mixed methods research: a review of critical issues and call for greater convergence.” *American Behavioral Scientist* 56 (6): 774-788.

Voorhees, R. 2008. “Applying mixed methods techniques in strategic planning.” *New Directions for Institutional Research* 137: 5-13.

[Back to contents](#)

## **Redesigning ourselves: who are we and who do we intend to become as visual arts teachers?**

*Ana Gonçalves de Sousa*

*University of Lisbon, Portugal*

anasousa@fba.ul.pt

### **Abstract**

This paper focuses on the process of constructing professional identities, based on the reflective assignments written by two beginning visual arts teachers during a methods course. Wondering how “Visual Arts Didactics (VAD)” could help prospective teachers go through the transition between who they are and who they intend to become, and drawing on the concept of “didactics triptych” (Alarcão 1997), we propose an understanding of VAD as the intersectional space between visual arts didactical “empirical knowledge” and visual arts “didactical research knowledge”. Acknowledging the popularity and ambiguity that autobiographical studies enjoy in teacher education (Nóvoa 2000), the different senses ascribed to reflection in teacher education programs around the world (Zeichner 2008), and the distinction between stories and histories (Goodson 2003), we conceived a collaborative research project designed to provide prospective teachers with a chance to shift from a passive and technician situation to an active and transformative one.

**Keywords:** identity; life history; narrative research; teacher education; visual arts didactics.

### **Context of the research**

Redesigning ourselves is a collaborative project created in the context of the Portuguese visual arts teacher education and developed through the teaching of Visual Arts Didactics (VAD), a methods course integrated in the Master of Visual Arts Teaching of the University of Lisbon. As researchers (Gonçalves de Sousa 2007), we found that there has always been a gap between visual arts teachers initial preparation in artistic domains such as Painting, Sculpture, Architecture and Design, and the education they receive for becoming teachers. Ever since its earliest days, Portuguese visual arts teacher education has regarded content knowledge (Visual Arts) and educational knowledge (including pedagogical and didactical knowledge) as two distinct fields, and visual arts teachers were qualified as visual art professionals and as teachers via two equally separate paths, without any connection. This gap has not only contributed to the discredit of teacher education among visual arts teachers, but also to the coexistence of at least two different identities: the identity related to the visual arts knowledge that they construct throughout their lives as a result of their non-formal and formal experiences, and the identity related to the educational knowledge they usually only develop as students enrolled in a teacher education program.

### **Research aim**

Redesigning ourselves aims to support beginning teachers through the transition between who they are (visual artists) and who they intend to become (visual arts teachers). The main purpose of this project is to provide prospective teachers with a chance to not only reflect on their understanding of the visual arts and why and how they should be taught, through the connection of those two paths, but also on framing that understanding within a global context, thus assuming a critical stance.

### **Theoretical framework**

As Alarcão suggests (1997, 160-162), we can distinguish three kinds of didactical knowledge that compose the didactic triptych: the empirical knowledge developed by teachers

when they teach (the professional didactics), the research knowledge centered on didactical issues produced by academics (the investigative didactics) and, finally, the curricular knowledge on didactics integrated in the form of subjects in teacher education programs (the curricular didactics). In an attempt to help prospective visual arts teachers to close the gap described above, we propose an understanding of VAD as the intersectional space between professional didactics and investigative didactics.

In VAD teaching we hold a broader understanding of the professional didactics, since a small number of our students have not yet begun their professional practices, even though all of them have already built their own conceptions of what teaching and learning the visual arts entails. As Goodson (2003, 59) we believe that: “Life experiences and background are obviously key ingredients of the person that we are, of our sense of self. To the degree that we invest our “self” in our teaching, experience and background therefore shape our practice.” Thus, we expand the professional didactics defined by Alarcão to a concept of empirical knowledge on Visual Arts Didactics built by beginning teachers not only when they teach, but also when they learn, throughout their entire lives (as daughters or sons, family members, students, visual arts students and visual artists). As Grauer says:

“Understanding of subject matter can be acquired in significant ways outside of colleges and universities. However, for teachers, much of their understanding of art education is a result of their own school experience. When preservice teachers think of teaching a school subject, they are responding to more than their personal ideas about that subject, they are also responding to their school-enculturated form of that subject.” (1997, 75-76).

### **Research methodology**

As human beings we build our identities through the relationships and dialogues that we establish with other human beings who ultimately reflect back to us the image we have of ourselves. In doing so, we collectively begin to answer two questions: who are we and who do we intend to become? As teachers this also happens inside and outside the classroom, with our students, colleagues, partners, children, family, neighbours, and all those people we meet in our daily lives; all those with whom we share our anxieties, worries, dreams, disappointments and hopes that, layer upon layer, shape who we are.

Based on a narrative approach to identity as a learning strategy (Ferreira-Alves and Gonçalves 2001), VAD invites beginning teachers to recreate and share their own school experience through writing assignments, oral and visual presentations and performances. These activities enable students to be aware of their own values and beliefs. However, this awareness is notwithstanding insufficient if the students are not able to locate their personal stories in the context of the broader history of Visual Arts Didactics. As Ivor Goodson (2003, 48) claims: “We need to move from life stories to histories, from narratives to genealogies of context.” And as Kit Grauer advises:

“Beginning teachers should be aware of the variety of instructional methodologies and strategies that are currently part of the field of education. As content knowledge, pedagogical and didactical knowledge cannot be taught in isolation from the prior backgrounds, beliefs and knowledge that beginning teachers bring with them into teacher education programs. Art teacher education courses should be planned to include strategies that will help teachers to examine their decisions about art education in conjunction with the values about subject matter knowledge and practical applications expressed in the field.” (2007, 78).

Accordingly, in VAD’s classes beginning teachers not only become aware of their values and beliefs by sharing their stories, but they also examine them through collaborative research (Zeichner 2008), based on current pedagogical and didactical knowledge of the visual arts. They read, comment on and discuss research articles, books and theses on visual art education, which are then analysed and constitute the bases for their reflection. Finally they compare the paradigms of art education they learn through the investigative didactics to their previous and present school experiences - the professional didactics, and gradually transform their stories into histories. The result is a visual arts teacher who is coming into being.

In this article, we trace the paths of Margarida and Nuno, two students and beginning teachers enrolled in VAD’s classes, establishing connections between their VAD’s assignments, such as writing a letter to a teacher (the first assignment) and the creation of a manifesto (the final assignment), and the autobiographical narratives that they wrote. We shall then present their stories in the context of the history of visual arts education and its teaching in Portugal. The two case-studies we present are the result of a collaborative construction of knowledge by both beginning teachers as researchers and the professor of VAD as academic researcher, as proposed by Zeichner (2008). Finally, the relevance of narrative research projects such as this for improving teachers’ sense of self and collective identity in teacher education programs will be discussed.

## Findings

### *Who is Margarida and who does she intend to become as visual art teacher?*

#### *Familiar, social and cultural backgrounds*

Margarida is a 49-year old Portuguese woman who was born and brought up in a middle-class family that provided her with an artistically and culturally rich environment. Her father was an advertising art director and her mother was a Drawing teacher who was formally trained as a painter. Margarida used to watch her mother’s lessons and enjoyed them very much. She begins her autobiographical narrative by describing her very first contact with the visual arts through her mother’s classes:

“I enjoyed watching her classes and only stopped doing it when I was in the 7th grade. I used to sit at the drawing board and draw for hours... In my mother’s classes I learned how to mix gouache colours sooner than most children. No-one taught me how to do it. I probably learned how to do it by observation and imitation of what was happening around me. Certain concepts of geometry and composition were also learned at my mother’s classes this very same way.” (*Margarida’s autobiographical narrative* 2013, 1).

At the age of six, she watched her mother’s Drawing classes of Women’s Education in the former Portuguese colony of Mozambique, Africa. When her mother returned to Portugal and resumed working as a visual arts teacher, she continued to take her three children along to the schools where she taught, not only during the school year but also during the holidays, where Margarida would play with her two brothers and the other teachers’ children. She recalled having painted two big murals at Escola Preparatória Avelar Brotero, one of the schools where her mother taught and which Margarida would attend herself a few years later. It is clearly evident that being a close bystander of her mother’s professional occupation since she was two years old sparked Margarida’s interest in Drawing and Painting and influenced the academic and professional choices that she ended up making later in her life.

Through her autobiographical narrative, certain characteristics of Margarida’s personality, such as her great sense of responsibility and perfectionism become evident. Margarida was the eldest daughter of the three children in the family. After her parents split up, when she was six years old, she moved to Mozambique with her mother and her two brothers. She recalls those years as the happiest of her entire childhood: she felt totally carefree. However, when she returned to Portugal two years later, her reality changed completely. At the age of eight Margarida became responsible for looking after her two younger brothers, who were six and three years old, while their mother was at work. She cooked, helped her brothers eat their meals and washed the dishes. As Margarida grew up, she became increasingly demanding with herself and perfectionist.

#### *Educational background: from elementary school to fine arts education*

Margarida describes herself as a responsible and thorough student. She was still in elementary school, when she became interested in drawing from life. Where the acquisition of drawing skills was concerned, she showed a precocious development, as we can attest by reading her first assignment: a letter addressed to her elementary school teacher. In this letter, Margarida reflects on the experience and consequences of creating the two most attention-demanding and

creative drawings that she made during her primary education. The first drawing was made from direct observation and depicted a flower in a glass medicine bottle. It was an exercise that Margarida’s mother had given to her students that she decided to take on herself. The second drawing was made from memory and attempted to represent the aerial perspective of a grass fire just as she had seen it from the viewpoint of her bedroom window. These drawings not only were not valued by her teacher, but the imperfections they contained were also pointed out as gross mistakes. Eventually, as a student, Margarida realized that creativity is not rewarded and that she got more praise when she made the same drawing day after day than when she tried to go further.

“I learned that I got more appreciation from the teacher if I presented to her variants of the same schemes (princesses, queens, fairies or ballerinas), because those drawings always turned out pretty and, predictably, the teacher would give them a good grade. The only two times that I risked doing something new and (therefore) more difficult, I was penalized. ... These two drawings turned out less perfect than those I usually made and the teacher expected to see, since I had gone out of my safety zone. ... Even so, the value of those two drawings lies precisely in the fact that I used all my skills to accomplish them, namely attention, observation, memory and some mastery of the materials. And that is the reason why I consider them as two of the best drawings that I ever made during my childhood.” (Margarida’s letter to her elementary teacher 2013, 5).

When it came to decide her area of study in 9<sup>th</sup> grade, Margarida had no doubts about her choice: she decided to pursue Art and Design, even if it entailed spending more time at school than regular students.

In university, choosing what to study was not so straightforward: she was torn between taking a degree in Design or a degree in Painting and despite being more inclined to choose Painting, Margarida ended up studying Design, because she was not sure of her own painting skills. Another reason for Margarida’s choice, recognized by her a few lines later, was her perfectionism:

“In the faculty, “Painting” professors prized experimentalism. I was not open at all to the possibilities offered by this method. I realized that I could not work without the security afforded by the sense of control. I was not able to accept the error, let alone to expose it and take advantage of it. In “Design”, I could also experiment, but within pre-established and more controlled limits, which made me feel safe.” (Margarida’s autobiographical narrative 2013, 6).

However, Drawing was the only subject that she liked in the course of Design. Therefore, after several academic years completing one or two subjects per year, she decided to pursue Painting. She did it because that would allow her to take Drawing until the 5<sup>th</sup> year, even though she knew that she would not be “completely fulfilled” in the course of Painting as well. Another subject that Margarida liked in the course of Painting was Visual Form, where visual arts and science meet. The books that she read for this subject proved useful for a theoretical work on Drawing that she did later. She concludes: “I would really like to have taken a degree in Drawing. If this degree course had already existed at the time I entered college, I am quite certain that I would not have taken so long to find my way.” (Margarida’s autobiographical narrative 2013, 8).

### *Margarida as an artist*

Although Margarida does not regard herself as an artist, we decided to refer to her by this title considering she has continuously developed artistic skills, broadening and deepening her artistic knowledge, not only conceptually but also in terms of artistic practice. As we said above, it was only after having studied Design and Painting that Margarida was able to follow her passion and finally study Drawing. In fact, Drawing had always been part of her life. And drawing has always been what she loves to do most. Thus, it was only natural that at age of forty-two, Margarida decided to take a Master degree in Drawing and felt finally in the right place.

Margarida described two episodes that attest to the importance of drawing in her life. The first one occurred when she was in secondary school, and the second one took place at faculty, during a lesson of Visual Communication. Margarida had a habit of drawing all the time, even at school, where she used to draw in class. As Margarida describes and relates these two episodes to each other, the conceptions (or misconceptions) about drawing revealed by each teacher become very clear. The first teacher, a History teacher who was a total stranger to the world of art,

considered drawing to be a distracting activity. For her, drawing was something that deviated the eyes, the hand and the mind of the student from the subjects that really mattered:

“She told to my mother that she suspected that I was cheating on tests. She considered that it was impossible for a student who was always distracted in class to achieve such good grades. My mother reassured her that I was paying attention despite being drawing. My mother told her that drawing in classes was natural to me, since I came from a family where drawing was common. ... From that day on, my teacher started to ask me impromptu questions to check if I was paying attention to her.” (Margarida’s autobiographical narrative 2013, 4).

Over the years Margarida became increasingly aware that her drawing in classes was frowned upon by the teachers in general. It was not until six years later that a fine arts professor made her feel that she was understood:

“During one particular lesson, the professor noticed that we were all engrossed in drawing and for that reason we were participating in class less than usual. He asked us to stop doing what we were doing (without mentioning that we were drawing) and to look around to see what everyone else was doing. When we realized that all of us had been drawing in class, we inevitably laughed. The professor then commented: “Drawing is a form of paying attention.” Finally! I thought. Wise words. I felt at home.” (Margarida’s autobiographical narrative 2013, 4).

Even though Margarida did not join the art world, she keeps the regular practice of drawing and she continues to bring to her practice the artistic knowledge that she has developed throughout her life by being almost uninterruptedly a fine arts student. She also attends exhibitions by other artists regularly and keeps appreciating the world through the eyes of drawing. In 2006, she developed an interesting project that involved a camera lucida, an indispensable drawing tool popular in the days before photography. More recently, she based her final VAD’s assignment, the manifesto entitled *Window of Opportunity* (2014), on Alberti’s veil. Fascinated with Drawing, one of Margarida’s favourite books is *Secret Knowledge: Rediscovering the lost techniques of the old masters*, which was written by David Hockney (2001) and is about the lost knowledge of optical instruments and drawing machines. Lastly, Margarida has recently acquired a modern reinterpretation of the camera lucida and she is excited about drawing with it.

#### *Margarida as a teacher*

Margarida has earned a living and financed her studies by teaching private lessons in Descriptive Geometry from a very young age. Although Margarida has great innate spatial perception, she only started to like Descriptive Geometry when she finally understood this subject with the support of a private teacher. From then on, Margarida started to derive enormous satisfaction from solving Descriptive Geometry problems. For her, the pleasure she derives from solving those problems has to do with the sense of security and self-confidence that they give her: “Knowing that there can be only one solution, which is absolutely and universally correct for each problem, regardless of the method chosen to solve it, reassures me greatly.” (Margarida’s autobiographical narrative 2013, 6) As a private teacher of Descriptive Geometry, Margarida always strives to solve problems through the cleverest possible way. Not only as a fine arts student, but also lately as a prospective teacher enrolled in a visual arts teacher education program, she has spent a lot of time and energy simplifying questions, and usually through very complex processes, she achieves the clearest possible answers to them.

Descriptive Geometry is part of the scientific dimension of the visual arts that appealed to her the most. The value ascribed by her to this objective knowledge is evident through Margarida’s narrative. When she was growing up, she recalls being absolutely fascinated when she was watching *Le Secret des Flamands*, a French television series about the rivalry between the Italian and the Flemish Renaissance painters, because: “Watching that series made me realize that painting is a science as well.” (Margarida’s autobiographical narrative 2013, 3) When she was studying Painting she loved the subject of Visual Perception. And more recently, when she was attending the first year of the Masters in Drawing, she was thrilled to increase her objective knowledge on subjects such as Digital Drawing, Scientific Drawing, Anatomic Drawing and Illustration: “Those modules had a decidedly more scientific aspect that complemented the generally more expressive



aspects of the practical subjects encompassed by the Painting degree course.” (Margarida’s autobiographical narrative 2013, 8)

Furthermore, we can assume that the skills she recognizes in her childhood drawings (attention, observation, memory and some mastery of the materials) are exactly the same ones that she values today as a prospective visual arts teacher. Those characteristics are clearly related to the objective knowledge involved in the process of drawing.

In her educational practice, Margarida not only strives to help her students to improve these skills, but she goes so far as presenting them with issues related to contemporary arts and visual arts education. Based on an interesting research concerning erasure she conducted while she was studying for her Masters in Drawing, Margarida asked her students (9<sup>th</sup> grade of the 3<sup>rd</sup> cycle of basic education) to be less concerned with the results and rather emphasize the process when using the rubber eraser for drawing, by not merely using it to erase mistakes. After presenting the history of the rubber eraser (from the technological point of view), and acquainting them with the work of three contemporary artists who used the rubber eraser for drawing, she asked them to create rudimentary stop motion animations. The students were asked to make a series of successive modifications in their own drawings. This activity was not quite as successful as she expected: “I realized that the students were reluctant to erase their own drawings, even partially, after the conclusion of the first part of the exercise.” (Margarida’s account of an experience as a teacher 2013, 6) If not just for the dilemma she brought into the classroom, the experience was already worthwhile. In fact, Margarida invited her students to overcome a difficulty commonly encountered when teaching Drawing: to overthrow their own preconceived ideas about using the rubber eraser. We can relate this goal, defined by Margarida as a teacher, to her own experience as a student and an artist.

Margarida’s concerns with the social implications of the amount of time allocated to the acquisition of visual literacy in the official curriculum is clear in her manifesto: it consisted of twelve timetables to be executed in laser-cut acrylic sheets, that made evident the reduced number of hours allocated to learning the visual arts in our schools today. According to Margarida, we can only appreciate and understand the visual arts if we acquire a solid and consistent visual literacy, which is virtually impossible with only 90 to 135 minutes of visual arts education per week. She strongly believes that it is essential for the teachers to have a solid artistic preparation in order to be able to improve the students’ visual arts literacy. In this sense, Margarida takes great pride in her own path:

“Teaching is a natural choice for me, because all my life seems to gravitate around teaching and schools. If I had acknowledged this before, I would probably have entered a course from a college of education, but thankfully I did not. My artistic vocation preceded my teaching vocation. I am not an artist, but I was formally trained like one. The courses that I completed at faculty provided me with a good artistic preparation, which I consider to be fundamental for teaching the visual arts.” (Margarida’s autobiographical narrative 2013, 9).

### ***Who is Nuno and who does he intend to become as visual art teacher?***

#### *Familiar, social and cultural backgrounds*

Nuno is a 38 year-old man who was born in Vernon, a town by the mountains of Normandy, France, and grew up in the seaside city of Peniche, Portugal. His parents were Portuguese immigrants in France who decided to return to their native country one year before Nuno entered elementary school.

From his childhood in France, Nuno misses the mountains, the castles and the lakes, the snowmen and the kindergarten he loved. Nuno has fond memories of the first five years of his life. He loved living in Gaillon, a quiet place, and joyfully playing at home and school. There, he felt secure and free to discover the world around him:

“I remember a photograph that was taken when I was in kindergarten in France. My sleeves were rolled up and I was working on collages. I remember walking in the woods: the leaves, the soil and the mud. And the smell of wet earth. The brown colour was so pretty! There were nuts. And at lunch we would be treated with cookies and stories. I had so many books! ... I did not lose one episode of the cartoon series

*Goldorak!* In the summertime, I loved eating ice cream and travelling to Portugal on vacations. (Nuno’s autobiographical narrative 2013, 1).

Nuno remembers the long trips between France and Portugal in his parents’ car, a Renault 16, for the summer holidays. He used to make drawings in large books, play with his Playmobile toys and listen to the albums of the romantic Spanish singer and songwriter Julio Iglesias, his parents’ favourite musician.

These early sensorial and affective memories would be soon followed by others just as happy as the first ones. The arrival in Portugal was somehow strange:

“Before that, Portugal meant great vacations, sun and sand! ... When we came to stay, they started calling me “the French”. There were no castles, nor lakes. But there were broiled fishes and Sumol pineapple juice. There were old houses and backyards.”.

And Nuno started to love living in Portugal. He started to enjoy the pleasure of living close to the sea. He recalls nostalgically that his grandmother used to take him to see the arrival of the fish. His grandfather was a fisherman and they used to wait for him and his trawler. Nuno also remembers playing with his friends at Cabo Carvoeiro and Carreiro do Cabo. He enthusiastically writes: “We used to jump from one rock to another, without fear!” Whether in France or Portugal, Nuno was a happy and self-confident child.

#### *Educational background: from elementary school to fine arts education*

Nuno recalls his primary education years as a dark period: “The elementary school was a torment.” (Nuno’s autobiographical narrative 2013, 1) During the four years of primary education, he had three different teachers. And he remembers paper pricking, an activity he did not like at all. Not only in primary but also in secondary education, Nuno does not recall having done any particularly exciting artwork: “We all did the same ordinary assignments and they all ended up looking exactly the same.” In fact, Nuno only developed his artistic skills at school, for example, by drawing while he was listening to the teachers of other subjects. His childhood drawings were based on the personal experiences he lived outside the school: “In classes, I used to draw boats and ships, filling the entire paper with them. Boats with multiple decks, hallways, windows... I imagined that they were large floating cities. Mazes. Spaces within other spaces.”

Nuno’s parents always encouraged him to draw. When Nuno was a child, they gave him paper and pencils for drawing while they were travelling. And he had the privilege of visiting not only many castles in Normandy, but even the Louvre, at the tender age of three. When Nuno was nine years old, they enrolled him in a ceramics workshop, so that he could come into contact with other ways of learning:

“It was a workshop where we developed different projects that were freer than those that we were given at school. Despite having been given the typical assignments to make: the basket, the jar, the vase, the dish... I enjoyed the process more than anything.”.

Nuno was also a close bystander of the artisanal labour of his grandfather, a fisherman who used to sculpt small and delicate boats, and his father, a woodworker: joiner and carpenter. Nuno remembers watching his father at work.

However, Nuno recognizes that it was only when he went to college that he truly started to learn and understand the visual arts as a form of knowledge. Before that, nearly all that the visual arts meant to him was the pleasure of the senses. At Escola Superior de Arte e Design (Caldas da Rainha, Portugal), Nuno deepened his theoretical knowledge of the visual arts, broadened his knowledge of contemporary visual arts, improved his artistic skills in new media and started to create artworks based on projectual methodology.

#### *Nuno as an artist*

The presence of drawing has been a constant in Nuno’s life ever since he was a child. Nuno loves to draw and he started to do it at an early age, not only at home and at school, but also when he was travelling, a habit he keeps today. When Nuno draws, he discovers the world through his

eyes (Nuno’s autobiographical narrative 2013, 8). If we understand travelling as a metaphor for being connected to the world, other landscapes, other people and other cultures, we can understand drawing as a comprehensive process for making sense of what we see. Thus, over the years, through drawing, he developed an artistic kind of understanding, which begins in his eyes, is then processed in his mind and comes forth in his paintings.

For Nuno, painting is more about transcending reality than merely copying it. This conception is revealed in the way he describes his own students’ work: “students imagine beyond the original lines” (Nuno’s account of an experience as a teacher 2013, 1) and is also evident in the way he describes his childhood drawings as a fictional world he created, based on the real world in which he lived.

As an inhabitant of Peniche, an important fishing harbour since ancient times, and as a grandson of a fisherman, Nuno draws on the sea theme, not only explicitly, like his childhood drawings of boats and floating cities, but also implicitly, like when many years later he collects objects washed ashore by the sea and uses them to create non-figurative paintings. The link between Nuno’s background and his grown-up paintings is clearly established in the text below, written by Jorge Lopes for their last exhibition:

“I was born in Lisbon and grew up in a village near Tomar, in the countryside. Nuno was born in France and grew up in Peniche, close to the sea. We both transpose our backgrounds into our paintings. We allude to the places where we grew up. I remember the day Nuno began to bring to the classes a lot of trash found on the beach. He made a sculpture with it. A few months later, he began painting some of those and other objects brought from the beach.” (Jorge Lopes, as in the digital invitation to the exhibition, 2013).

We can see a connection between Nuno’s interest in assembling those unusual objects into a sculpture and his grandfather’s hobby and his father’s job. Of course, watching his grandfather and his father at work enabled Nuno to understand visual shapes and to learn and appreciate the subtractive process that they used to give shape to objects.

However, Painting is the artistic field preferred by Nuno. In 2004, after completing his fine arts studies at Escola Superior de Arte e Design (Caldas da Rainha), he was recognized as the most promising artist of his course by Nuno Crespo, a Portuguese art critic and essayist who emphasized “the way he applies the colour to create images that are among the animal, the organic and the fantastic” at a Público newspaper article.

Nuno’s exhibitions deliberately have no titles. Although his artworks always depart from something concrete, they soon acquire an abstract dimension, as was stated by Jorge Lopes (2013): “He quickly abandoned the figurative representation. I believe that the fishing nets and the plastic caps in dozens of shades of blue were just an excuse for him to begin. He used them to approach painting as a field of emotions.”

Another characteristic of Nuno’s artistic process is the solitude that he needs in order to focus on what he is creating. As a painter, Nuno prefers to work by himself. The first studio that he ever rented was located in the fortress of Peniche, the very same prison facility where, during the dictatorial regime of Salazar, political prisoners occupied their time making crafts. It was in this local atelier that Nuno had his own cell: “There was a deep silence. On certain days, we could hear the noise made by the saws. ... I was completely concentrated when I was working in that place.” (Nuno’s autobiographical narrative 2013, 4) The silence, the solitude and the concentration are concepts frequently used by Nuno to define the experience of working in other studios he rented in different periods of his life. Nuno describes the time he worked at his studio in Areia Branca (a beach near Peniche) as a prolific phase of his work: “I painted day and night without schedules and without any program. It was spontaneous. And physical. It was just me and the painting.” (Nuno’s autobiographical narrative 2013, 9) From that time, he recalls a visit made by a kindergarten teacher and her school class: “Her little boys and girls observed intently part of the process of my work. They left quietly, letting me stay concentrated.” (Nuno’s autobiographical narrative 2013, 8).

### *Nuno as a teacher*

His earliest professional experience that involved his social skills took place when he was

still a teenager and had just started working as an animator in a radio station. A few years later, in 1997, Nuno had his first educational experience at the age of 21 years old as a monitor in Italy, where he had travelled to through a student exchange program.

Little did he know that 10 years later, in 2007, he would actually become a teacher for the first time, formally employed by a school: the basic school (2<sup>nd</sup> and 3<sup>rd</sup> cycles of basic education: ages 10-15) of Leça do Balio (Oporto). In the meantime, he studied fine arts in Caldas da Rainha (2000-2004), and developed several activities related to education, in which he could improve his skills as a prospective teacher, such as being a cultural animator at a library (2004), creating a painting studio for children with some of his friends (2005-2007) and working as a monitor in a children leisure centre (2006).

Nuno considered the possibility of becoming a teacher when he was studying fine arts in Caldas da Rainha. In the 1<sup>st</sup> year, he was distressed and full of doubts and for a while he wanted to drop out. A supportive teacher encouraged him to continue to study fine arts for the following academic year with a little more motivation. Nevertheless, he still had doubts about his choice, so he applied for a degree course in visual arts teaching. But he finally decided to become an artist, and he continued to work on that. Today, Nuno realizes that it was a good decision. He has no regrets about his chosen path. Broadening and deepening his artistic knowledge and being connected with the visual arts world enabled him not only to become an artist, but also to become a better informed visual arts teacher.

“I think I got 19 points. But I did not follow that path. Thankfully. I wanted to be an artist, period. Teaching would come later. I continued my journey quietly. I met interesting people. I learned about Alexandr Sokurov’s work and his film *Mother and Son* (1997). I learned about Bill Viola’s work and his video *The Reflecting Pool* (1977-79). I learned about the works of Duchamp... And so many others! (Nuno’s autobiographical narrative 2013, 6).

After graduating in 2004, Nuno continued to pursue his artistic practice while beginning to develop his first educational experiences. As a non-formal teacher, Nuno was keenly aware of the heaviness and meaninglessness of formal education, in which children are seen as labourers who are granted no time for playing, having fun and learning by themselves. In his “classes” Nuno endeavoured to give them what was left out in formal education: “I never understood the purpose of so much homework. What about playing? We played a lot and, above all, children could play outdoors how they wanted to and for as long as they wanted to.” (Nuno’s autobiographical narrative 2013, 7)

If Nuno was already fed up with the compulsory educational system before entering it, he did not become any the more enthusiastic when he began to work at Basic School of *Leça do Balio* (2<sup>nd</sup> and 3<sup>rd</sup> cycles of basic education, ages 10-15) near Oporto. Nuno describes this first experience as a teacher of formal education as awkward and unpleasant:

“I worked and lived in Oporto for a year. I was teaching for the first time. I had no idea what I would find there. My first class was traumatic. A 7th grade student insulted me. I also had no idea of what a lesson plan was! And meetings! People were very helpful, but I was anxious and lost. The school was dark. The people were grey. Some of them were tired of teaching, waiting for their late retirement. They were dark grey. They all plodded along their lacklustre paths without light. I was scared. The smell was not helping either! The school smelled of closed furniture! It smelled of walls! It smelled of hallways! And smelled of closed rooms! It was strange. I kept the biographical records with students’ photographs.” (Nuno’s autobiographical narrative 2013, 6-7).

Nuno’s manifesto, a video dedicated to all his students, integrates those biographical records, as well as other records that he collected in the subsequent years, and attempts to emphasize the excessive and absurd bureaucracy that characterise the compulsory educational system.

During that first year, he endeavoured to develop along with his students a project which he believed was worthwhile, in a context that seemed adverse to him. Departing from a school assignment that he was given to make when he was a student himself, he led the students to do something different. The project was about creating patterns and at first it was no different from any regular visual arts education assignment. In fact, his students started to do something very similar to Nuno’s description of his own experience at school (Nuno’s autobiographical narrative 2013, 2). However, in his classes they went further. Nuno’s students not only created the patterns

and filled them with colour, but also “imagined beyond the original lines, interacting with the shapes in a dynamic way” (Nuno’s account of an experience as a teacher 2013, 1). After completing their own projects, the students proceeded to share and exchange them with their classmates, engaging in a collective, dynamic and open activity that only ended when they created a visual composition of forms against the two-dimensional background provided by one wall of the classroom, using adhesive tape. According to Nuno, it was interesting to enjoy the critical and the decision-making dimension of the student’s minds: “They were permanently questioning themselves about the order or disorder of the visual compositions they were creating collectively.” (Nuno’s account of an experience as a teacher 2013, 2) Besides giving his students freedom and promoting their autonomy, Nuno strives to improve their social interaction skills and strengthen their own individual and collective identities, as attested by the following description of a project that he developed a few years later as a teacher of the alternative curriculum of an elementary school:

“The students created the text, the puppets, the sound and the music by themselves. ... The children were proud of their work. ... There was a very close relationship with children and their parents. I recall everyone was so involved! The children were happy to present the puppetry show in the library, before all the other school classes and the school community. (Nuno’s autobiographical narrative 2013, 10).

One of Nuno’s most significant experiences was his recent apprenticeship at School of Ponte, a Portuguese alternative curriculum public school which made him realize that it is possible to learn through other kind of social structures, less standardized than those found in the regular schools and closest to Nuno’s ideal of how childhood should be lived:

“Arriving at that school and seeing those happy faces delighted me. I started to love teaching again. I have to cross a bridge every time I go to “Escola da Ponte” [Bridge School]. ... I feel that educating is like crossing bridges. As we teach, we are learning as well. Bridges are places of transition, connection, meeting and sharing.” (Nuno’s autobiographical narrative 2013, 8).

### **Conclusions and implications for teacher education**

As many Portuguese children, not only of past times but unfortunately of present-day times as well, Margarida and Nuno recall their primary education as a dark period where visual arts learning is concerned. However, we collectively realized that, in our elementary schools, the time, the space and the freedom to teach and learn visual arts has become gradually even scarcer. Today, the visual arts curriculum in the Portuguese elementary schools is non-existent, with the visual arts still taught by elementary school teachers (if it is ever taught at all).

As most of their colleagues, Margarida and Nuno realized that the artistic development that they experienced during their childhood and youth was provided by their non-formal education rather than the compulsory education system.

Despite the adverse context of their formal education concerning the visual arts, they both had the privilege to learn them outside the school. Margarida’s family environment was so imbued with the fine arts that it was predictable that she should also follow that path. And although Nuno may not have grown up in such an erudite artistic environment as Margarida did, his parents made every effort they could to provide him with non-formal experiences through which he could develop his artistic skills.

Despite the differences between their own individual backgrounds, both of them felt insecure about their own artistic skills when they reached university. We collaboratively conclude that this may be the result of a poor secondary artistic education. We also realized that this reality is becoming even more real nowadays. For instance, the artistic subject of Art History, due to policy regulation, has been made an optional subject and as a consequence the visual arts students reach university without any knowledge in this field.

Indeed, the objective knowledge remains prevalent in Portuguese visual art education today. Geometry, which has been the main content of Drawing since the time it was taught in elementary schools in the middle of the nineteenth century, not only continues to have a higher relevance in the primary and secondary visual arts education curricula, but is also the key subject to enter into

artistic courses in university. The value ascribed to this subject is such that the results obtained by the students on the exam are decisive for entering the only two fine arts faculties that exist in Portugal. This explains why so many students undertake private lessons, such as those that Margarida teaches.

As university students, Margarida and Nuno were taught within a structure of art education that hovers between the expressionist and the formalist paradigms (Efland 1995). The latter is prevalent in the Portuguese secondary schools and is also the most evident in the classes they teach as beginning teachers. However, if in terms of methodology we can see a resemblance between their educational practices, the values and beliefs on which they rely are quite different. According to Nuno, formalist knowledge is just a means to achieve the freedom to break the lines, and creativity is both an individual and a collective process that requires emotional and social skills. According to Margarida, formalist knowledge is the key for creating and understanding the visual arts through a rational and controlled process. Nuno values the expressionist paradigm and identified it when he reflected on his own educational practice. Margarida defends the formalist paradigm and her values and beliefs are very consistent with her educational practice. Nevertheless, they both strive to impart a kind of art education that they did not have when they were students. They challenge their students by presenting them issues related to contemporary arts and visual art education; they integrate their own research in their classes, and they attempt to bring their students' knowledge into the classroom. In doing so, they both reveal a tendency to adopt a mainly constructivist stance. And they gradually constructed their own pedagogical and didactical content knowledge, one of the first and the major challenges teachers face, as Grauer (1997, 73) points out. They are finally starting to be the authors of their own professional lives. As Goodson and Sikes hold:

“Life history allows us to stand back and examine our own and other people experiences of schooling, as “data” to be analysed, compared and interpreted, and can lead us to a more considered, better informed view which may reaffirm us in what we are doing or lead to change of some kind.” (Goodson and Sikes 2001, 73).

They may be insecure at some times, and they may not know how to teach in order to answer to a particular problem at other times, but now they are better informed. They know who they are and who they want to become as teachers. They are learning to cross bridges, merging different visual art education paradigms and creating their own. It is not a matter of being right or wrong. What matters most is that their educational practices are falling in step with their personal beliefs and knowledge, and coming closer to the idea of learning that they desire for their own children.

As Goodson (2003, 7) argues: “In developing teachers' professional knowledge, the joining of “stories of action” to “theories of context” is especially imperative. Without this kind of knowledge, teaching becomes the technical delivery of other people's purposes.” Connecting their personal stories and the collective history of the visual arts teaching, this project has enabled these beginning teachers to shift from a passive and technicist situation to an active and transformative one. In short, it has enabled them to consciously “walk the talks” (Grauer 1997). More projects such as this must be included in teacher education programs for an educational change to happen, not only in the field of visual arts, but also in other fields of study, and not only in Europe, but internationally as well.

### Acknowledgements

We thank all the beginning teachers of the Master in Visual Arts Teaching of the University of Lisbon, especially Ana Margarida Boavida e Nuno Franco, for their participation and engagement in this project. We thank our doctoral tutor Margarida Calado for her support and guidance during the development of this study.

### References

Alarcão, I. 1997. “Contribuição da didáctica para a formação de professores: reflexões sobre o seu ensino.” In *Didáctica e formação de professores: percursos e perspectivas no Brasil e em Portugal*, edited by S. Garrido Pimenta, 159-190. São Paulo: Cortez.

- Boavida, A. 2013-2014. *Visual arts didactics’ assignments: letter to a teacher, autobiographical narrative, account of an experience as a teacher* (2013) and *Manifesto* (2014).
- Efland, A. 1995. “Change in the conceptions of art teaching.” In *Context content and community in art education: beyond post modernism*, edited by R. Neperud, 25-40. NY: Teachers College Press.
- Ferreira-Alves, J., and Ó. Gonçalves. 2001. *Educação narrativa do professor*. Coimbra: Quarteto.
- Franco, N. 2013-2014. *Visual arts didactics’ assignments: letter to a teacher, autobiographical narrative, Account of an experience as a teacher* (2013) and *Manifesto* (2014).
- Goodson, I. 2003. *Professional knowledge, professional lives: studies in education and teaching*. Maidenhead: Open University Press.
- Goodson, I., and P. Sikes. 2001. *Life history research in educational settings: learning from lives*. Buckingham: Open University Press.
- Gonçalves de Sousa, A. 2007. *A formação dos professores de artes visuais em Portugal*. Master dissertation, University of Lisbon.
- Grauer, K. 1997. “Walking the talk: the challenge of pedagogical content in art teacher education.” In *Readings in Canadian Art Teacher Education*, edited by K. Grauer, and R. Irwin, 73-80. Quebec: Canadian Society for Education through Art.
- Nóvoa, A. 2000. “Os professores e as histórias da sua vida.” In *Vidas de Professores*, edited by A. Nóvoa, 11-30. 2<sup>nd</sup> ed. Porto: Porto Editora.
- Zeichner, K. 2008. “Uma análise crítica sobre a reflexão como conceito estruturante na formação docente.” *Educação e Sociedade* 29 (103), 535-554. <http://www.scielo.br/pdf/es/v29n103/12.pdf>
- Zeickner, K. 1998. “Para além da divisão entre professor pesquisador e pesquisador académico.” In *Cartografia do trabalho docente: professor(a) - pesquisador(a)* edited by C.Geraldi, D. Fiorentini, and E.Pereira, 207-236. Campinas: Mercado de Letras ABL.

Back to contents

## Promoting academic development through situated critical reflection

*Cecília Guerra<sup>1</sup>, Helena Pedrosa-de-Jesus<sup>1</sup>, António Correia<sup>2</sup>, Ângela Cunha<sup>2</sup>, Adelaide Almeida<sup>2</sup> & Mike Watts<sup>3</sup>*

<sup>1</sup> *Department of Education, Research Centre Didactics and Technology in Education of Trainers, University of Aveiro,* <sup>2</sup> *Department of Biology, CESAM, University of Aveiro, Portugal &* <sup>3</sup> *Department of Education, Brunel University, United Kingdom*

cguerra@ua.pt, hpedrosa@ua.pt, antonio.correia@ua.pt, acunha@ua.pt, aalmeida@ua.pt & mike.watts@brunel.ac.uk

### Abstract

The collaboration, since 2007, between educational researchers and four Biology teachers from the University of Aveiro, in Portugal has provided a strong understanding of the dynamics of a variety of academic approaches and reflective practices. Following a co-researcher model, educational researchers worked with these university teachers in natural settings through several curricular units, being able to analyse, reflect, practice and evaluate new teaching and learning approaches. The research methodology is based on a critical social paradigm, assuming principles of action-research. Data were collected through non-participant observations of various classes, participant observation during the informal contacts with teachers (before or after classes), regular meetings with the research group, and semi-structured interviews conducted with teachers. Results indicate how university teachers have interpreted their academic experiences concerning the design of some innovative strategies. However, there is clear evidence that it is important to provide individual support to enhance Academic Development.

**Keywords:** academic development; teaching and learning; critical reflection; higher education.

### Context of research

Many changes in higher education derived from Europe-wide initiatives such as the Bologna process have given increasing attention to student-centred teaching approaches, allied to growth in teachers' academic development (Clarke and Reid, 2013; HE Academy, 2011). Our study is one component of a long-standing project focused on ways to promote academic development in the context of higher education. Work since 2001 has provided a strong understanding of the dynamics of student-generated questioning, inquiry-based learning and academic practices (Pedrosa-de-Jesus, Lopes, Moreira and Watts, 2012). This current investigation is called “A study of academic development in universities through innovative approaches in teaching, assessment and feedback” (e-Daun)<sup>1</sup> and entails close collaboration between researchers at the University of Aveiro (UA), Portugal, from the Department of Education and colleagues from the Department of Biology. The primary purpose has been to contribute knowledge concerning effective ways to stimulate teachers' academic development, principally through the promotion of critical reflection, using naturalistic contexts of collaboration.

### Research questions

In the context described above, it has been important to find answers for the following research questions: 1) How to design teaching, learning, assessment and feedback approaches in order to foster innovation and academic development in higher education? 2) How could we measure the impact of these approaches on teachers' academic development and growth?

The main goals are to: (i) work together with university teachers in designing and adopting novel practices to meet new demands on their time and teaching; (ii) investigate innovative teaching, learning, assessment and feedback approaches and (iii) promote university teachers' academic reflection about their practices.

In this paper we present a few examples of innovative approaches designed and implemented



by these group of university teachers along two academic years (2012/2013 and 2013/2014), and discuss the impact of this collaboration on their academic development and growth.

## Theoretical framework

### *Reflection and feedback*

Our starting point here is Biggs’s (1999) “constructive alignment” between a programme’s learning outcomes, teaching strategies and methods of assessment. In our version (Figure 1) we have added elements of feedback and of academic self-reflection. The feedback has been the subject of considerable discussion, not least in our own work (for example, Pedrosa-de-Jesus, Moreira, Lopes, and Watts 2014). This feedback can take the form of discussions with colleagues at programme level on what exactly the course aims to achieve, “feed-forward” to students on what they are expected to do to meet the learning outcomes, peer discussions on strategies for teaching and learning, dialogue with students on various classroom approaches, formative and summative feedback on assessment, etcetera.

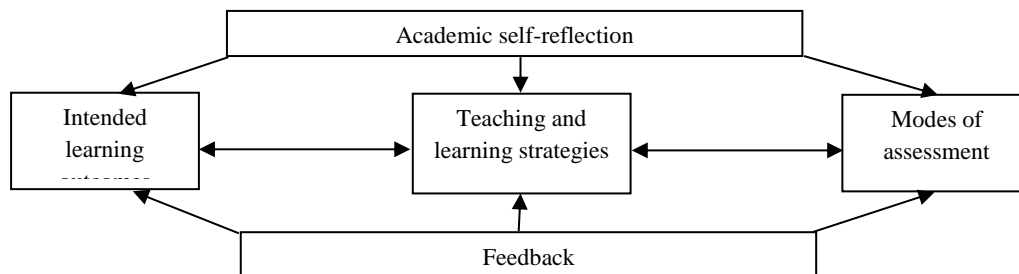


Figure 1. The role of feedback on academic grow of university teachers

On the other hand, “reflective” practice implies a level of structured questioning and of systematic review by the teacher that should be carefully considered and often documented (Clarke and Hollingsworth 2002). In our view, an inevitable product of teachers’ reflection on their teaching practices could be new understandings and altered perspectives of their practices (Clarke and Hollingsworth 2002; Schalkwyk et al. 2013). In this way we have traded heavily on university teachers’ academic reflections, what we sometimes refer to as their “situated critical reflection” (Malthouse, Roffey-Barentsen and Watts 2014). Building on ideas from Schön (1987), Kolb (1984) and Gibbs (1988), Malthouse, Roffey-Barentsen and Watts (2014) advocate that “situated critical reflection” seeks to “... add to the body of knowledge in a way that enables people to make sense of their world by observing the prevailing extended or external influences” (4). Reflective practice could be entailed by three “situational contexts”: setting, social and personal/individual. The “setting” context is related with the physical environment, the surroundings, the time, systems, access and availability of information, the ambiance. The “social” context is connected with the working/learning community, its history, its ethos, the roles, responsibilities, relationships, tasks and expectations, other people, what the participants are actually doing, their goals, the activities involved. Finally, the “personal” context is focused on individual competencies, intentions, moods, engagement, and expertise (Figure 2).

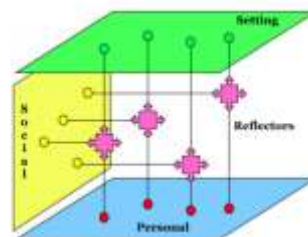


Figure 2. Individual reflectors within three contexts (Malthouse, Roffey-Barentsen and Watts 2014, 5)

### *The change environment*

The supportive environment is important for university teachers’ academic growth. In the following figure (Figure 3), we draw on Clarke and Hollingsworth’s (2002) depiction of the change environment, and explore its value for higher education in order to interpret the connections between four domains: “external”, “personal”, “practice” and “consequence”. The external domain (designing and sharing practices with peers and educational researchers) is distinct from the others by its location outside teachers’ immediate personal world, which encompasses their actions, the inferred consequences of those actions, and the knowledge and beliefs that prompt and respond to those actions.

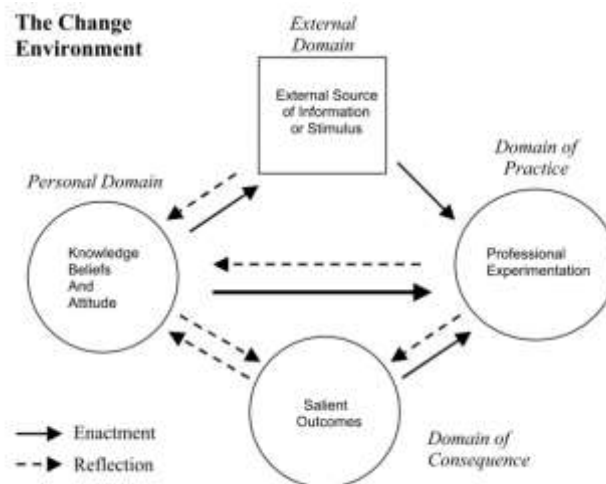


Figure 3. Interconnected model of professional growth (Clarke and Hollingsworth 2002, 951)

The model allows analysis of how university teachers enact and reflect upon their teaching, and the planned changes that this reflective thinking generates in the personal domain, their domain of practice and domain of consequence. The term “enaction” allows us to distinguish the translation of a belief or a pedagogical conception into action of something a teacher knows, believes or has experienced as a professional.

### *Academic growth*

The Teaching and Learning International Survey (OECD 2009, 49) describes professional development and pedagogical training as those “activities that develop an individual’s skills, knowledge, expertise and other characteristics as a teacher”. In this context, it is important to understand how to promote university teachers’ academic development. A Report to the European Commission on Improving the Quality of Teaching and Learning in Europe’s Higher Education Institutions (European Commission 2013, 13) states that: “A good teacher, like a good graduate, is also an active learner, questioner and critical thinker”. The same report recommends that: “All staff teaching in higher education institutions in 2020 should have received certified pedagogical training” (64).

Academic development can be seen as the process that promotes university teacher’s knowledge related with teaching, learning, assessment and feedback practices. It is in this context that we see the scholarship of teaching and learning (SoTL) as helping university teachers to be suitably critically reflective about their teaching, within a supportive educational community and, more importantly for us, to explore students’ learning processes (Hutchings and Shulman 1999). Hutchings, Huber, and Ciccone (2011) argue that the role of SoTL should emphasise principles of learning through inquiry (into and about practices and results), collaboration, reflection and action in the service of ongoing improvement of university teachers’ academic knowledge.

We add to this Weston and McAlpine’s (2001) summary of the development of the scholarship of teaching in a continuum of three phases: growth in one’s own teaching (development of personal knowledge about their own teaching and students’ learning); dialogue with colleagues about teaching and learning (development and exchange of knowledge about teaching and learning in their discipline); and growth in scholarship of teaching (develop scholarly knowledge about teaching and learning that has significance and impact for the institution and the field).

The need to encourage and support the academic development of university teachers has already been internationally recognised (HE Academy 2011; Clarke and Reid 2013; Stes, Coertjens, and Van Petegem 2010). In Portugal, Huet, Costa, Tavares, and Baptista (2009) have also highlighted the importance of promoting training programmes in order to stimulate teachers’ academic development.

In summary, we are interested in the academic development of university teachers as they reflect and feedback on their teaching and learning activities within programmes of study. We see our role as supportive co-researchers, facilitating and enhancing discussion and scholarship on learning outcomes, strategies for teaching and learning and modes of assessment. This takes place within a “change environment” and enables academic growth to take place.

### **Research methodology**

The research approach is based on a critical social paradigm, assuming principles of action-research methodology (Cohen, Manion, and Morrison 2007). According to Schmuck (2006, 36), action research implies that “the researcher [an outsider] collaborates with practitioners [teachers] in identifying research problems, its causes, and possible forms of intervention”.

The project is organised in three stages: (i) an analysis of the materials (teaching content, type of assessment and means of feedback) and the teaching and learning strategies implemented in four curricular units during the academic year; (ii) the design of innovative teaching, learning, assessment and feedback strategies that encourage student autonomy; new modes of assessment and improved forms of feedback within each of these curricular units, and (iii), an evaluation of these strategies in terms of effectiveness in practice.

University teachers’ academic development models are more effective where they involve strong forms of support (Kennedy 2005). Our research preference has been for a transitional “instructional coaching approach” (Knight 2004) that might contribute to the academic development of the university teachers involved.

During two academic years (2012/2013 and 2013/2014), the educational researchers (“coaches”) collaborated with four university teachers in order to facilitate the identification and resolution of educational problems (for example, students’ learning difficulties). The main aim of this collaboration was to incorporate inquiry into university teachers’ practices with the intention of developing their academic knowledge.

Following a model of co-researcher (Macaro and Mutton 2002), we have had the opportunity to undertake research in natural teaching-learning settings and the university teachers reflected upon, analysed, practiced and evaluated new approaches to teaching and learning in a supported way.

Data were collected through non-participant observation of various classes in naturalistic contexts; “low-participant classroom observation” during informal contacts with the teacher (before or after classes). Participant observation during the regular meetings with the research group, and semi-structured interviews conducted with both teachers and 18 students at different points in the project. All the written documents produced by the participants, as a consequence of the research innovations introduced, were also selected for analysis. Since the data gathered is mainly qualitative and descriptive, the main methodology adopted has been content analysis (Bardin 2000), supported by N’Vivo 9 software. Figure 4 shows the framework constructed for analysing academic development, using Weston and McAlpine’s (2001) and the adapted SoTL framework together with Clarke and Hollingsworth’s (2002) change environment. This framework allowed us to analyse the impact of the “External domain” (i.e. collaboration with educational researchers), the

“Domain of Practice” (i.e. teaching experimentation) the “Domain of Consequence” (salient outcomes), and their personal reflections in the “Personal Domain”.

Dimensions	Categories	Sub-categories	Indicators
Adapted from Clarke and Hollingsworth’s (2002)		Adapted from Weston and McAlpine’s (2001)	
A. Domain of Practice	A.1 Development of teaching, learning, assessment and feedback strategies in curricular unit	Phase one: Growth in own teaching	A.1.1 Identification of educational problems and possible solutions for its resolutions
			A.1.2 Design of solutions to the educational problems identified
			A.1.3 Implementation of solutions to the educational problems identified
B. Domain of Consequences	B.1 Reflection about salient outcomes emerged (focus on academic development and/or students’ learning)	Phase two: Dialogue about teaching and learning	B.1.1 Reflection about the solutions designed for educational problems previously identified
			B.1.2 Drawing on literature and research on teaching to inform practices
			B.1.3 Publishing and making presentations about teaching (which may or may not be based on research)
			B.1.4 Applying for funding for research on teaching
		Phase three: Growth in SoTL	

Figure 4. Framework for analysis of university teachers’ academic development

A “template approach” (Robson 2002) was implemented, with dimensions and categories developed, cross-linked with literature review and research questions. A set of initial key codes was defined through combining the initial reading of the data collected with the literature findings, namely the investigation related to the concept of academic development. The establishment of “new codes” implied repeating the reading of the data in order to maximize consistency and reliability of analysis. For instances, the university teachers’ interviews were been over-looked in order to make sure that information that lead to the definition of a new code was not present in any earlier transcript.

## Findings

This section presents and discusses some results about the impact of the “external domain” in the “practical domain” (i.e. teaching experimentation) and in the “domain of consequence” (salient outcomes). In this instance, the external sources of stimulus for change are those that are extant in many (most) universities: the changes required of programmes to accommodate to new intakes of student, of new subject content matter, the introduction of new technologies, of new patterns of learning, of developing practices in teaching - prompted not least by external forces such as the Bologna Process. There were external sources of information introduced by the educational researchers as they worked and, drawn in too, by the subject specialist teachers themselves. Some of these have been logged and discussed, and commonly appear in some of the contributions to scholarship catalogued in the following sections (teaching practices and salient outcomes, focused on academic grow).

Several innovative teaching, learning, assessment and feedback strategies were designed, implemented and evaluated within four curricular units: “Microbiology” (1<sup>st</sup> semester) and “Genetics”, “Microbiology and Pharmacology” and “Evolution” (2<sup>nd</sup> semester). Pedagogical assumptions conveyed by the Bologna process (i.e. teaching strategies focused on students’ centred learning), have been central to the work developed by this interdisciplinary team. Figure 5 shows some results that emerged for the “Domain of Practice” (A) related with “Development of teaching, learning, assessment and feedback strategies” in these curricular units during the two academic years (2012/2014).

A Maintenance/Adaption/Innovation designation was developed in order to identify “Growth in own teaching” (Phase one), that is, growth in each university teacher’ practices (see Figure 5):

Maintenance - sustaining a teaching, learning, assessment and feedback strategy, without researcher’s collaboration, with the purpose of delivering benefit(s) for student’s learning; Adaptation - adapt a teaching, learning, assessment and feedback strategy, which was previously developed with this research team (between 2007 and 2010), with the purpose of delivering benefit(s) for student’s learning; Innovation - design a new teaching, learning, assessment and feedback strategy with the purpose of delivering benefit(s) for student’s learning. Results have highlighted the “SoTL products” when the university teachers reflected about the approaches implemented within their curricular contexts. These reflections were also presented internally, on the context of two institutional seminars, allowing to share and discuss the new pedagogical experiences. The seminars were entitled: “Jornadas Práticas de Qualidade no Ensino e Aprendizagem” (Quality Practices in Teaching and Learning) and “Inovação Pedagógica” (Pedagogic Innovations).

### ***Teachers’ reflections***

Teachers’ reflective perceptions were collected through semi-structured interviews at the end of each academic year (2012/2014). The first part of each interview aimed to capture teachers’ perceptions about the impact of the research collaboration in their teaching experimentation (A - Domain of practice). The last part of the interview sought teachers’ opinions regarding the impact of this collaboration in their own academic development (B - Domain of consequences). As an example, we will present Teachers’ A and B reflections about the impact of the research collaboration in their teaching experimentation (Microbiology and Genetics) and also in their own academic development. The content analysis allowed the identification of important text units, and these were clustered to identify general and unique categories (Cohen, Manion, and Morrison, 2007).

#### *Microbiology and Genetics*

##### A - Domain of practices

The Microtalk strategy was first attempted by Teacher A in 2010/2011, in collaboration with the educational researchers. This strategy aimed at stimulating students’ knowledge about research in microbiology (i.e. the topic of bacteria with antibiotics’ resistance). Each talk had twelve minute presentations by researchers from the Department of Biology, and five minutes for discussion with students. In the following academic year (2012/2013), the Microtalks were filmed using EDUcast service<sup>2</sup> making it available on Moodle so that students could review them and submit questions and/or queries either to researchers or to the teacher [Teacher A - Adaptation]. Teacher A considered that the implementation of this teaching strategy was an opportunity for students to understand several microbiology topics, relating it with the curricular unit contents:

“I noticed that in smaller groups of students there was an interest, because they asked several questions about if they [Microtalks] will happen more often ... which shows that there was interest and motivation ... they [students] felt that there was an area of work that was more interesting for them.” (Teacher A - first interview).

He also considered that it allowed students to expand their knowledge about microbiological research. Nevertheless, Teacher A did not evaluate the impact of this strategy on students’ assessment: “I do not know if this had an impact on assessment ... it may have had an impact in medium terms rather than on assessment.” [Teacher A - first interview]. During the present academic year (2013/2014), this strategy was explored in order to allow the interaction between teaching and research. Teacher A identified three teaching strengths:

First, is to bring authentic research to the classrooms, which is related to my own research group... Second, is to show some diversity of topics in microbiology in a concrete way. Third, it shows that research is an activity that people can do. Can be a profession, does it not? Because students have the opportunity to see real researchers and could question them, could discuss (Teacher A - second interview).

Curricular unit	Classes	Strategies	Description	Teacher involved	Academic year	
					2012/2013	2013/2014
Microbiology	Lectures (2 hours per week)	Microtalk	Conducting 4 lectures by researchers in Microbiology, and filmed by Educast system	Teacher A	x	x
		Organizational study questions	Designing 80 questions in Microbiology for guiding students in their autonomous learning		x	x
	Tutorial (1 hour per week)	Teacher’s oral feedback	Conducting a face-to-face session in order to give oral feedback to students’ questions and doubts		x	x
		Teacher’s written feedback	Sending a written feedback (through Moodle) to students’ questions and doubts			x
	Lab sessions (2 hours per week)	Online questionnaire	Designing an online questionnaire with a presentation of a practical problem in Microbiology. The aim was to stimulate students’ questioning, submitting questions for its resolution		x	
		Rubric assessment questionnaire	Drawing a rubric with assessment criteria for the students’ responses of the online questionnaire		x	
Mini –Questionnaires		Designing 5 short questionnaires in order to promote students’ involvement in the preparation of laboratory classes of Microbiology		x		
Genetics	Lectures (2 hours per week)	Scitable	Exploring an online tool with scientific contents in Genetics	Teacher A	x	
		Organizational study questions	Designing 80 questions in Genetics in order to guide the students in their autonomous learning		x	
		Questions Online	Designing a online questionnaire, which requested students’ questions about Genetics		x	
	Lab sessions (2 hours per week)	Mini –Questionnaires	Designing 5 short questionnaires in order to promote students’ involvement in the preparation of laboratory classes of Genetics		Teacher B	x
Evolution	Lectures (1 hour per week)	Critical analyses	Producing a critical analyses of a selected press note related to the topic of evolution (i.e., the advent of genetic diseases) – Group work	Teacher C	x	x
		Teacher’s written feedback	Sending written formative feedback of critical analysis(through e-mail) to 21 groups of students		x	
		Students’ written feedback	Sending written formative feedback of critical analysis(through a excel document and e-mail)to 21 groups of students			x
Microbiology and Pharmacology	Lectures (1 hour per week)	Questions online	Designing a online questionnaire, which requested students’ questions	Teacher D	x	x
		Teacher’s oral feedback	Oral feedback to Questions in Microbiology online			x
		Teacher’s written feedback	Written feedback (through Moodle) to Questions in Microbiology online		x	x
	Lab sessions (2 hours per week)	Mini –Questionnaires	Designing 5 short questionnaires in order to promote students’ involvement in the preparation of laboratory classes of Microbiology			x

Legend of the “Maintenance / Adaption/ Innovation model”: ■ Maintenance ■ Adaption ■ Innovation

Figure 5. Results emerged for practical domain (teaching experimentation) (2012/2014)

Some of the teaching strategies implemented by this group of teachers were originally designed with the collaboration of educational researchers through previous projects (Pedrosa-de-Jesus, Lopes, Moreira, and Watts, 2012), using questioning as a tool for the development of students’ learning and teachers’ academic development. As an example, we can refer to “Organizational study questions” and “Questions Online”.

The Organizational study question strategy was first explored during 2008/2009. Teacher A did not know if his students had really used this strategy for their autonomous learning. Nevertheless, he advised his students (those attending Microbiology and Genetics) to answer questions using the online learning tool available on Moodle so that they could select the top five most complex questions (i.e. if they could not find the answers autonomously through Internet and/or books study).

Teacher A reflected on the strengths and constrains of this teaching strategy by saying that:

“The questions are designed with spontaneity, that is, they are not taken from a book ... nor exist, for example, in exams from previous years. Sometimes they [questions] have emerged during lectures or from something that I felt was not clear [regarding contents], questions that students ask me or a discussion that students had with me at the end of the lecture. I remember that this happened this semester [2012/2013].” (Teacher A - second interview).

The Questions Online strategy was first implemented during 2012/2013, aimed at stimulating the development of students’ competences, such as questioning and autonomous learning. To do so, they were provided with another online tool on Moodle with the purpose of collecting questions and/or doubts of students on the topics covered during lectures (Microbiology and Genetics). Few students, however, used this online learning tool in Microbiology (9 students in 2012/2013 and 16 students in 2013/2014) and nobody used this tool in Genetics (2012/ 2014). Teacher A’s interpretation of students’ behaviour is as follows:

“I think, once again, that students may not have immediately understood the utility of this activity, because the students’ adherence was not very big. However there were students who sent me elaborate questions... they were few, but the students that sent me questions used the questions that I had given to them as a start point [Organizational study questions].” (Teacher A - second interview).

However, Teachers A and B demonstrated the potential positive use of Scitable<sup>3</sup> in Genetics. Teacher B even stressed the potential of this online learning tool, stating that:

“Scitable is a very interesting tool. Obviously it has some inaccuracies, but it is a good base to have as a starting point of information... and then it leaves an open door for those [students] who are more interested in certain topics and want to explore it more.” (Teacher B - first interview).

## B – Domain of consequences

Teacher A also pointed out the role of inter-departmental collaboration in their motivation for teaching innovation, stating that:

“The fact is that an external push exists ... a kind of audit. Well I don’t think it is exactly an audit, but there are people who are observing, there are people who are seeing things, there are people who ask questions ... and this what happens ... the need to change every year with reflection on what is being done and, therefore, this has been very important.” (Teacher A - first interview).

We consider that one very important contribution of this collaboration was the way this teacher was able to reflect on his own practices:

“Another positive impact was that we were able to record MicroTalks. We would not have done this without this collaboration. The fact that all teachers have to talk to an outsider [educational researcher] who asks them questions is a very significant aspect for reflection about what we are doing.” (Teacher A - first interview).

This collaboration had also a considerable impact on the assessment of students’ learning. Once again, this shows the importance of questioning on the constructive alignment between teaching, learning and assessment, as pointed out by teacher B:

“These are two very important aspects: the matching between teaching strategy and modes of assessment and, on the other hand, the appreciation of the question-answer process. ... This dialogue process as a

learning tool is very valuable. And, it turns lectures into becoming much more interesting.” (Teacher B - first interview).

### **Conclusions and implications for teacher education**

Making changes to teachers’ practices and conceptions of teaching and learning is very difficult and challenging in the context of higher education (Pedrosa de Jesus and Silva Lopes, 2012). This collaborative study, developed since 2007, has already shown the extent to which experimentation with innovative strategies by this group of university teachers is strongly influenced by their particular conceptions of teaching (their “personal domains”).

This paper presents some insights related to academic development and growth in higher education. We have described some of the changes that have taken place, the innovative approaches that have been designed and implemented over two academic years (2012-2014) involving educational researchers and four university biology teachers. Results from classroom observation, individual and group meetings and teachers’ individual interviews indicate how university teachers have interpreted their academic experiences concerning the design of some innovative approaches.

The data was organised according to the framework constructed for the analysis of the academic development, using Weston and McAlpine’s (2001) and the adapted SoTL framework together with Clarke and Hollingsworth’s (2002) change environment. This also allowed analysing the university teachers’ ability to enact upon their teaching and how their critical thinking generated changes in the domain of practice and domain of consequence.

The four university teachers introduced a number of innovations into their practices, such as MicroTalks, Scitable, the use of students’ questions for different purposes and dialogic classroom processes. Some of these innovations were designed with the collaboration of the researchers and they developed others autonomously. These strategies were undertaken despite the time that university teachers have to spend for their implementation and all of them recognized the learning benefits for students, such as developing their critical thinking competence.

There is evidence from study, too, for the “transference” nature of the change process as academic development grows. That is, changes that occur in one domain (i.e. domain of practice) lead to changes in another (i.e. domain of consequence). The close collaboration with, and external stimulus of, the co-researchers have clearly influenced their academic practices as teachers.

The four university teachers expressed their intention to continue to refine and improve their own academic practices. Their overall comments on the project showed that they would not have undertaken and benefitted from this kind or level of educational enquiry without the collaborative input and support from each other and from educational colleagues. They also made “situated” and “reflexive” comments about the role of the institution in the innovation of their practices, which have to deal with organisational structures constrains and diversity of contexts.

From these results, it is important to have a better understanding of the transfer process from the external domain into teachers’ personal world, in order to design adequate support systems for their academic grow. It is therefore essential to continue supporting/coaching these university teachers to design and implement more and better innovative strategies. Results show that academic development in higher education can successfully explore the “external”, “personal”, “practice” and “consequence” domains of the teacher activity. Concerning teacher academic grow, our role has been that of supportive co-researchers, encouraging and enhancing their academic development. The “instructional coaching approach” (Knight, 2004) has been the main way to achieve our goals, co-sharing the design of innovative approaches and by promoting university teachers’ critical reflection about their innovation in teaching, learning, assessment and feedback.

### **Acknowledgements**

We would like to thank Professor António Correia, Professor Ângela Cunha, Professor Adelaide Almeida and Professor Fernando Gonçalves from the Department of Biology of the University of Aveiro, Portugal, and all the students involved in this research.



This research was financed by European Funds “FEDER através do Programa Operacional Factores de Competitividade - COMPETE” and by National Funds through “FCT - Fundação para a Ciência e a Tecnologia” project «PTDC/CPE-CED/117516/2010».

## Endnotes

1. Available at <http://edaun.web.ua.pt/>
2. Available at <http://www.ua.pt/stic/PageText.aspx?id=14306>
3. Scitable is a free science library and personal learning tool brought to you by Nature Publishing Group, the world's leading publisher of science. Available at <http://www.nature.com/scitable>

## References

- Biggs, J. 1999. “What the student does: teaching for enhanced learning.” *Higher Education Research and Development* 18 (1): 57-75.
- Clarke, C. and J. Reid. 2013. “Foundational academic development: building collegiality across divides?” *International Journal for Academic Development* 18 (4): 318-330. doi: 10.1080/1360144X.2012.728529.
- Clarke, D., and H. Hollingsworth 2002. “Elaborating a model of teacher professional growth.” *Teaching and Teacher Education* 18 (8): 947-967.
- Cohen, L; L. Manion, and K. Morrison. 2007. *Research methods in education*. 6<sup>th</sup> edition. London: Routledge.
- European Commission 2013. *Report to the European commission on improving the quality of teaching and learning in Europe's higher education institutions*. Luxembourg: Publications Office of the European Union.
- Gibbs, G. 1988. *Learning by doing: a guide to teaching and learning methods*. Further Education Unit. Oxford: Oxford Polytechnic.
- Higher Education Academy 2011. *The UK professional standards framework for teaching and supporting learning in higher education*. <http://www.heacademy.ac.uk/assets/documents/ukpsf/ukpsf.pdf>
- Hutchings, P., and L. Shulman. 1999. “The scholarship of teaching: new elaborations, new developments, change.” *The Magazine of Higher Learning* 31 (5): 10-15.
- Hutchings, P., M. Huber, and A. Ciccone. 2011. *The scholarship of teaching and learning reconsidered: institutional integration and impact*. San Francisco: Jossey-Bass.
- Huet, I., N. Costa, J. Tavares, and A. Baptista. 2009. *Docência no ensino superior: partilha de boas práticas*. Aveiro: Editorial da Universidade de Aveiro.
- Kennedy, A. 2005. “Models of continuing professional development: a framework for analysis.” *Journal of In-Service Education* 31 (2): 235-250. doi: 10.1080/13674580500200277
- Knight, J. 2004. “Instructional coaches make progress through partnership.” *Journal of Staff Development* 25 (2): 32-37.
- Kolb, D. 1984. *Experiential learning: experience as the source of learning and development*. Upper Saddle River, NJ: Prentice Hall.
- Macaro, E., and T. Mutton. 2002. “Developing language teachers through a co-researcher model.” *Language Learning Journal* 25 (1): 27-39.
- Malthouse, R., J. Roffey-Barentsen, and M. Watts. 2014. “Reflectivity, reflexivity and situated reflective practice.” *Professional Development in Education*: 1-13. doi: 10.1080/19415257.2014.907195
- OECD. 2009. *TALIS Technical Report*. OECD: Paris.
- Pedrosa-de-Jesus, H., and B. Lopes. 2012. “Exploring the relationship between teaching and learning conceptions and questioning practices, towards academic development.” *Higher Education Research Network Journal (HERN-J)* 5: 37-52.

- Pedrosa-de-Jesus, H., B. Lopes, A. Moreira, and D. Watts. 2012. "Contexts for questioning: two zones of teaching and learning in undergraduate science." *Higher Education* 64 (4): 557-571.
- Pedrosa-de-Jesus, H., A. Moreira, B. Lopes, and D. Watts. 2014. "So much more than just a list: exploring the nature of critical questioning in undergraduate sciences." *Research in Science and Technological Education* 32 (2): 115-134. doi: 10.1080/02635143.2014.902811;
- Robson, C. 2002. *Real world research: a resource for social scientist and practioners-researchers*. Oxford: Blackwell Publishing.
- Schmuck, R. 2006. *Practical action research for change*. Thousand Oaks: Corwin Press.
- Schön, D. 1987. *Educating the reflective practitioner*. San Francisco: Jossey-Bass.
- Shulman, S. 1987. "Knowledge and teaching: foundations of the new reform." *Harvard Educational Review* 57 (1): 1-22.
- Stes, A., L. Coertjens, and P. Van Petegem. 2010. "Instructional development for teachers in higher education: impact on teaching approach." *Higher education* 60 (2): 187-204. <http://link.springer.com/article/10.1007/s10734-009-9294-x#page-1>
- van Schalkwyk, S., F. Cilliers, H. Adendorff, K. Cattell, and N. Herman. 2013. "Journeys of growth towards the professional learning of academics: understanding the role of educational development." *International Journal for Academic Development* 18 (2): 139-151.
- Weston, C., and L. McAlpine. 2001. "Making explicit the development toward the scholarship of teaching." *New Directions for Teaching and Learning* 86: 89-97. <http://onlinelibrary.wiley.com/doi/10.1002/tl.19/pdf>

[Back to contents](#)



## **Vocational and professional training of the teachers of natural sciences in Serbia between yesterday, today and tomorrow**

*Milan D. Stojković*

*Friedrich-Schiller-University of Jena, Germany*

milan.stojkovic@uni-jena.de

### **Abstract**

This paper presents the professional and pedagogical training of teachers of natural sciences at primary, vocational schools and gymnasiums in the Republic of Serbia. In addition, it describes the school system, the structure of education and science teaching in Serbia today. The central part of the paper deals with the legal provisions on professional, continuous education of teachers, goals, norms, rules, and alternative forms of teacher education. Moreover, seminars in the field of natural sciences are presented, and their concept and contents analysed. Finally, the advantages and disadvantages of further education of teachers and current problems of further teachers training will be discussed.

**Keywords:** school and education system in Serbia; further education of teachers; seminars in science teaching

### **Introduction to the topic**

Historically, during the Cold War and splitting of Europe into Blocs (after 1945), the education and school system in the former SFR Yugoslavia was developed under the influence of West European and Eastern (the former USSR) school systems (Vajngand 1971 cited in Bojović 2009). It was only later (in the 1960s) that the SFRY formed its own school system (Leko 1968; Bojović and Šišović 2005). After the disintegration of Yugoslavia in 1991/92, Serbia retained the structure of the Yugoslav system of education, as well as the school laws and regulations within teacher professional training. Today's professional programs for further development and education of teachers are based on these school regulations. Although the school system and education were taken over from the Yugoslav one, in the last decade, there have been considerable legal changes concerning further education of teachers, as well as vocational and professional training of the teachers in Serbia. However, in order to more clearly present and explain the education of the teaching staff in Serbia today, it is necessary to briefly introduce and explain the basic characteristics of the school and educational system, school laws and standards.

### **The aim of arguments**

During the last twenty years (since the disintegration of Yugoslavia in 1991/92), certain novelties have been introduced concerning vocational and professional teacher training in Serbia. Since 2001, a reform of professional education of teachers has been conducted. It includes the introduction of mandatory professional training of teaching staff, state examinations-licence, conducting accredited seminars, as well as the implementation of the standards of competence, establishing a network of institutions (Regional Centres) for the implementation and realisation of teacher training, defining alternative and parallel possibilities for further teacher education and training, and establishing contacts with foreign educational and school institutions. However, only few works deal with these issues; therefore, there is a need for a wider and deeper analysis of all the aspects of teacher education in Serbia today, especially regarding the comparison with the programmes and education of other European countries. On the other hand, a considerable number of publications have been made on the curricula of natural sciences, and which also juxtapose them with foreign curricula (Bojović and Šišović 1993; 1999; 2003 and 2005). Due to a small number of papers on this topic, school laws, standards, norms, regulations and online sources (data from the Internet) will be used to present, reconstruct and discuss professional teacher training in Serbia.

The main aim of this paper is to present further teacher education and training in Serbia today, the State exam (licence), as well as the structure and organisation of seminars and other (alternative) forms of professional training. The standards of competences, and the structure, organisation and performance of seminars are also presented, and the contents of accredited seminars analysed. Moreover, current problems in teacher education are discussed, and activities and other possibilities suggested in order to improve professional education of teaching staff in the near future. The paper also describes briefly the structure of the school and education system (levels), certain legal norms within the Law of Education, and school subjects (natural sciences) at primary and secondary schools and gymnasiums.

## Theoretical framework

### *The structure of the education system in Serbia*

The education system in Serbia today consists of three levels: primary, secondary and higher (Figure 1). The primary education consists of two sub-levels: pre-school and primary school level. The Pre-school education is compulsory, according to the Law on Education, for all children between 5 and 6 years of age. The kindergarden can be private and state (Zakon o predškolskom obrazovanju i vaspitanju – “Sl. glasnik RS”, br. 18/2010).

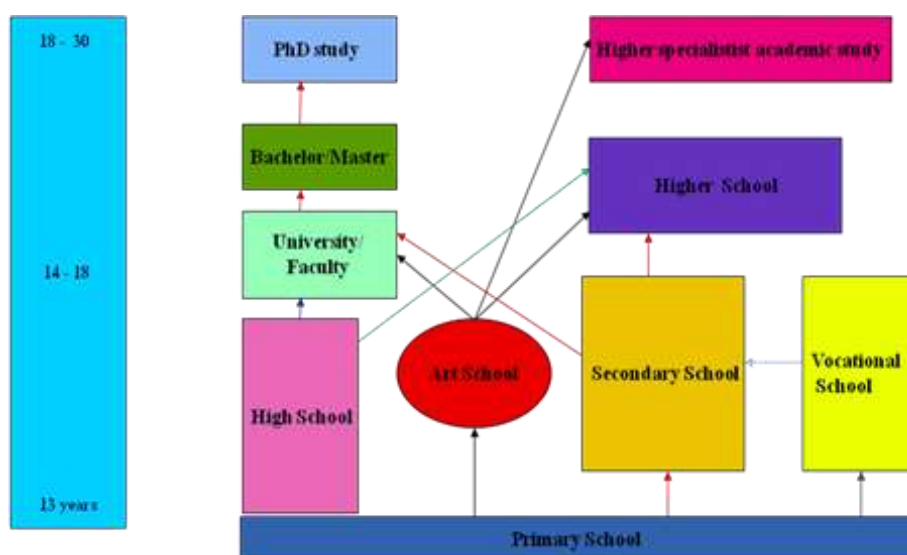


Figure 1. School and Academic institutions in Serbia today

The basic level of education is primary school, which lasts eight years in total. The primary school can be divided into two levels: 1-4 gr. (lower primary school) and 5-8 gr. (higher or extended primary school). According to the Law on Education, primary school is compulsory for all pupils from the age of 7 to 15 years. According to the Law on Education, every person shall have the right to education. The citizens of the Republic of Serbia are equal in exercising their right to education and pedagogy, regardless of their gender, national, religious and language background, social and cultural background, financial status, age, physical and psychological constitution, developmental impairments and disabilities, political opinion or another personal trait. Persons with developmental impairments as well as persons with exceptional abilities shall be entitled to education and pedagogy which takes into consideration their special educational needs, within the regular system, within special classes or a special school. Foreign citizens and persons without citizenship shall be entitled to education under the same conditions and in the same manner prescribed for the citizens of the Republic of Serbia (Zakon o osnovama sistema obrazovanja i vaspitanja – “Sl. glasnik RS”, br. 72/2009, 52/2011 i 55/2013).

The education and pedagogy work shall be delivered in the Serbian language. The education and pedagogy work for the members of national minorities shall be delivered in their native language. Exceptionally, it may be delivered either bilingually or in the Serbian language. The education and pedagogy work may be delivered in a foreign language or bilingually. The education and pedagogy work for persons using the sign language (visually impaired or blind persons) or special script or formats, shall be delivered in sign language with the use of means of that language (Zakon o osnovama sistema obrazovanja i vaspitanja; Zakon o osnovnoj školi - "Sl. glasnik RS", br. 50/92, 53/93, 67/93, 48/94, 66/94, 22/02 i 62/03; Zakon o srednjoj školi - "Sl. glasnik RS", br. 50/92, 53/93, 67/93, 48/94, 24/96, 23/2002, 25/2002, 62/2003, 64/2003, 101/2005 i 72/2009).

In primary school, there are compulsory, compulsory elective and optional electives. Among the compulsory subjects from the group of natural sciences in the lower primary grades, apart from mathematics (1-4 gr.), there are: The World Around Us (1 and 2 gr.), Health Education and Nature and Society (3 gr.), as well as Nature Study and Society Study (4 gr.). The optional elective in lower grades is Guardians of Nature (2 gr.). Higher primary grades include the following subjects from the group of natural sciences: Mathematics (5-8 gr.), Biology (5-8 gr.), Physics (6-8 gr.), Chemistry (7 and 8 gr.), and Geography as a natural and social science (5-8 gr.). Optional electives in higher primary grades are: Computer Sciences (5-6 gr.) and Intro to Computer Sciences (7-8 gr.). Compulsory elective subjects are: Religious Instruction, Civic Education (5-8 gr.), and Elective Sport (5-6 gr.) (Osnovna Skola "Sveti djakon Avakum" 2010).

Secondary education lasts four years and includes the following high schools: vocational, art schools and high schools/gymnasiums. In addition to these schools, there are the three-year-long secondary schools for education of students in the field crafts and two-year-long special schools for students with special needs. Secondary education is not compulsory according to the Law on Primary School. Schools can be private or public schools (Zakon o osnovama sistema obrazovanja i vaspitanja; Zakon o srednjoj školi).

In secondary school, there are compulsory subjects and electives. Compulsory subjects can be: general and vocational subjects. Subjects from the group of natural sciences in general type and natural science gymnasiums are: Mathematics (1-4 gr.), Biology (1-4 gr.), Physics (1-4 gr.), Chemistry (1-4 gr.), and Geography (1-43 gr.). Within socio-lingual type gymnasiums, the same subjects are taught, in different grades though: Mathematics (1-4 gr.), Biology (1-3 gr.), Physics (1-4 gr.), Chemistry (1-2 gr.), and Geography (1-3 gr.). Electives are Religious Education and Civic Education (Zavod za unapredjenje obrazovanja i vaspitanja n.d.).

Subjects in vocational schools (1-3 gr. and 1-4 gr.) are grouped according to departments within a work area (vocation). For example, within the vocational profile: chemistry, non-metals and graphic art, in a vocational school of 3<sup>rd</sup> degree (1-3 gr.), of the following departments: makers of chemical products, cellulose and paper, pyrotechnists and refinishers, the following subjects are taught: Chemistry (vocational subject, 1-3 gr.); general subjects are: Mathematics (1-3 gr.), Physics, Ecology and Environmental Protection, and Geography (1 gr.). The department chemical engineering technician - chemical laboratory technician (secondary school of 4<sup>th</sup> degree, 1-4 gr.) includes the following subjects from the group of natural sciences: Chemistry (vocational subject, 1-4 gr.); general subjects are: Mathematics (1-4 gr.), Physics (1-2 gr.), Biology and Geography (1 gr.). Elective subjects are the same as in gymnasiums (Zavod za unapredjenje obrazovanja i vaspitanja n.d.). In primary school, when moving from lower to higher primary grades, (5 gr.), there is no integrative subject (teaching) which consolidates teaching contents of natural sciences (like, for example, MNT, Mensch-Natur-Technik, Man-Nature-Technics in 7/8 gr. gymnasium in Germany) (Thüringer Schulportal 2009).

Higher level of education includes higher schools: colleges, Faculty and University. Higher education lasts two to three years (4-6 semesters). The University education lasts four to six years (8-10 semesters). After the year 2003 the reorganisation of higher education institutions was carried out according to the Bologna Convention (Law on Higher Education). After undergraduate studies one could enroll postgraduate studies for a period of two years (max. 4 semesters) or, after that, the PhD studies for two to three years (Zakon o Univezitetu - "Sl. glasnik RS", br. 54/92, 39/93, 44/93, 53/93, 67/93, 48/94, 24/96, 7/98 i 54/98 i 21/2002).

### ***Further teacher education after graduation and during the work at school***

After completing the undergraduate studies, all newly employed teachers (teacher referents or apprentice) in the primary and secondary schools are required to obtain the so-called state examination (before 2001), today the licence (after 2001). In essence, preparing and taking the exam today has not greatly changed since the period before 2001 (Table 1). The first difference includes the renaming of the state exam into the licence. Preparing for the exams has also changed, with the introduction of mentoring principles. In addition, the main place of taking the state exam is no longer a university or college, but a primary or secondary school in the city of Belgrade and the Ministry of Education: the total number of days planned to take the state exam remain the same, as well as parts or phases of the exam. In this case, there has been a change in the order of taking the examination. Only, today the candidate takes the knowledge of the provisions of the Law of Education of the Republic of Serbia, as well as the Law on Primary and Secondary Education (Table 1). At the end of the examination process, the candidate-teachers receive from the Ministry of Education the document under the title “licence” (Serb. Licenca). If, in their work, teachers (or other professional staff) commit the violation of the provisions of the Law on the Foundations of the Education System (on child and employees discrimination, violence, abuse and neglect, political organising and activities, as well as the regulations on the responsibilities of employees), they are temporarily removed from work place. During the suspension, the teacher is not entitled to work in the institution, while the licence is suspended for a period of six months. The licence may also be suspended to a teacher who, according to the findings of the education adviser, has not been performing their education and pedagogical duties or has failed to engage in professional development during their work. The final decision on licence suspension is passed by the Ministry of Education. The person whose licence has been suspended is eligible for the termination of licence suspension if they pass the licence exam again. If they fail to do so, their employment is terminated. In addition, while the suspension is effective, the teacher is able to attend teaching activities of other teachers according to the decision of the headmaster. The teacher who had their licence terminated is no longer able to work in the institution nor are they eligible for a new licence. The terminated licence is returned to the Ministry of Education. (Zakon o osnovama obrazovanja i vaspitanja; Pravilnik o dozvoli za rad nastavnika, vaspitača i stručnih saradnika 2005 and 2008).

Table 1. The state exam in the period before 2001 and after 2001

Before 2001- the state exam	Since 2001: State exam or “License“
Venue: Faculty; Preparations for the exam: 1 to 2 years, as a trainee teacher at primary or secondary school without the participation of a mentor in the preparation period; Exam: duration 2 to max. 3 days.	Testimony or work permit. Preparation period: maximum 2 to 3 years. Venue: Belgrade, Ministry of Education and a primary school on the territory of Belgrade: an exam based on mentorship; Demonstration classes at school max. 16 classes (1 class-45minutes).
Parts of the exam: exam - three parts: 1. Writing lesson plans on a (selected) teaching topic; 2. Oral exam – this part of the exam used to consist of 3 questions on school laws, common law, political system and the organisation of the Socialist Republic of Serbia/Yugoslavia; 3. Practical part – conducting school experiments.	Phases of the exam - three parts: Demonstration classes; Writing the lesson plan for the class; Oral exam; Preparations and the exam are financed by candidates-teachers-trainees themselves!

### ***The basics of professional development of teaching staff***

In the last few years, certain changes within professional teacher training have been adopted by the Ministry of Education and the Department for the Advancement of Education. According to the new laws on continuous professional education, the programme of professional teacher training (2012) includes:

- continuous professional training, developing competences to better perform their job, and

- improve the level of student achievement;
- the Institute for the Advancement of Education announces a competition for the approval of the programme of professional training every two years;
- the competition is open to: primary school teachers, secondary school teachers, as well as college and university professors, pedagogues, psychologists, special education teachers, sociologists, citizens of the Republic of Serbia working, being educated or studying abroad;
- seminar venues: Regional Centres for Teacher Education, all types of schools, higher education institutions, premises of local government, and other public institutions;
- in the course of five years a teacher acquires at least 120 credits in various forms of professional development;
- 68 hours per year of various forms of professional development: 24 hours of attending approved conferences and programmes, and 44 hours within development activities. One hour of attending training at a professional meeting or seminar counts as 1 credit; in forms of training at an international level, credits are doubled (Pravilnik o stalnom stručnom obrazovanju nastavnika, vaspitača i stručnih saradnika 2012).

### ***Other forms of professional development of teachers***

Parallel with the preparation and examination, there are alternative options for further education of teachers. They are primarily designed to involve all teachers in schools who have not taken the state exam or licence. Schools are also given other possibilities for further professional development and education of teachers in accordance with legislative provisions. This includes the following school programmes for further teacher education:

- School Development Programme or the program of independent school development “SDP” includes many different development programmes (Školski razvojni plan OŠ “Jelena Četković” 2012–2014). Generally, they relate to the teaching, organisation of teaching, extracurricular activities, improvement of working conditions in schools and financial situation through finding a donor, development of independent school programs depending on the school resources. The implementation of selected development program lasts four years, there after a new school programme is selected for another period of 4 years;
- “self-evaluation” is also a school program associated with the *SDP* programme and represents one part of this programme (Zavod za vrednovanje kvaliteta obrazovanja i vaspitanja n.d). It is a school program based on constant research in teaching. The main goal of “Self-evaluation” program is the constant self-evaluation based on the results achieved in the chosen school development programme. The team consists of the teaching staff at the school, divided into main and sub-teams. Their task is to implement certain parts of the school programme, and together with the main team participating in the creation of others school programs.
- school parliament or the so-called democratisation of schools is the programme implemented by students/pupils of elementary (V to VIII gr.) and secondary or high school (1 to 4 gr.) (OŠ “Sveti Sava” Kikinda n.d.). Students choose themselves their representatives for the School Parliament. All schools parliaments in the territory of one city represent the main school parliament. The School Parliament can be managed by the Coordinator of SDP and Self-evaluation and other teachers can also be involved in the work of School Parliament. The main task of school parliament is to implement programs related to teaching and student extracurriculum activities. The Students become acquainted through the school parliament with the principles of democracy, and the functioning and operation of democratic institutions.



***Standards of competence and seminars within the natural sciences***

In order to improve and enhance the quality of teacher education in Serbia, the National Council for education, at the proposal of Ministry of Education, issued and adopted for the school year 2011/12 the new competency standards for teachers and their professional education and training. The new standards include a total of 4 competencies (abbreviated K) within certain fields or spheres of activity educational work are grouped (“Gazette of RS”, No. 13/2012, 53 pages, VI chapters and 49 articles) (Table 2).

Table 2. New standards of competence according to the law of continuous professional education of teachers in Serbia

Competency standards for teachers and their professional development:
K1 - Competencies for the teaching area, subject and teaching methods,
K2 - Competencies for teaching and learning,
K3 - Competencies for supporting the development of student’s personality,
K4 - Competencies for communication and cooperation.

All fields of social and natural sciences (including elementary and secondary levels) are grouped in the first standard of competence - K1 (Table 2). Accredited seminars are planned for each of these areas according to the topics of competence.

The competency standards define the goals of the seminar programmes as well as the forms of vocational and professional education of teachers. According to the instructions of the professional education of teaching staff (teachers, educators and associates), an accredited program should aim for (Pravilnik o stalnom stručnom obrazovanju nastavnika, vaspitača i stručnih saradnika 2012): developing all the competencies of the teacher and associate in a balanced way; and introducing with scientific and professional innovations in a relevant field.

In addition to the accredited seminars (programs of continuous professional development), they have foreseen the following forms of continuous professional development: accredited programs of higher education institutions as a form of lifelong learning; professional gatherings; summer and winter schools; and professional trips and study tours.

The Department for the Advancement of Education (Serb. Zavod za unapređenje obrazovanja i vaspitanja) announces a public competition every two years. Regulations determine the procedure and rules of the accreditation of seminars, duration, number of participants and credits, location, field and topic. The duration of seminars ranges from one to three days, credits from minimum eight to maximum 24 credits, and the number of participants from minimum 15 to maximum 30 per seminar (Pravilnik o stalnom stručnom obrazovanju nastavnika, vaspitača i stručnih saradnika 2012).

The Centres for training and professional education of teachers were established 10 years ago with the financial support of Switzerland and the Kingdom of Norway (EFTA countries), with the aim to improve the quality of teacher education in Serbia and teaching in schools in Serbia. In total, 12 centres have been established in the cities of the large region in Serbia. They all form the so-called Network centres (RC-NIŠ 2014).

Seminars deal with the teaching topics in primary and secondary schools, including the history of science, methodology and didactics, school experiments, scientific literacy, use of multimedia, integrated science teaching, interdisciplinarity, learning methods and techniques, popularisation of sciences, tests, standards and student achievement, teaching clubs, industry and technology (Katalog programa stalnog stručnog usavršavanja nastavnika, vaspitača i stručnih saradnika za školsku 2012/13 i 2013/14).

Within the standard K1, for the school years 2012/13 and 2013/14, 67 seminars were accredited for science teaching. Of that number, 16 seminars belong to the subjects of chemistry, biology, physics and mathematics each. The remaining 61 seminars fall on in other spheres within the social sciences. About 7% of seminars are devoted to sciences, 23% out of which to teaching chemistry (about one third), less than 1% of the seminars deal with the topic of experimental chemistry teaching. The total number of seminars is 1002, which is a very large number of seminars offered to a number of teachers and pupils in schools in Serbia.

### ***Problems within further education of teachers***

There are other problems, which are closely related to the professional education of teachers and education in general. Currently, the biggest problem is a lack of funding (Čalija 2012). The Lack of funding is reflected in the poor organisation of science teaching due to the lack of teaching aids, laboratory facilities, laboratory equipment and utensils, as well as school furnishing. Precisely because of this situation, teaching science is based on the theoretical approach (Bojović 2009).

Likewise, the frequent protests and strikes of teachers reflect the dissatisfaction of teachers with their economic and social status, as well as the ever-increasing demands for reform of the school system (Gavrilović 2013). The introduction and preparation of students for the small mature (8 gr.) in elementary schools, preparing and taking the final examination at school makes teaching process very difficult. Teachers and other teaching staff are preoccupied with curricular and extracurricular activities, as well as a lack of coordination between the Ministry of Education and the school, which reduces the time to prepare students and solve problems with printing test (examination) material (Ilić 2010).

Generally, the problems mentioned, concerning lack of financial resources and organisation of (experimental) teaching, are certainly reflected on the organisation and realisation of the professional education of teachers. Within the financing of professional education, teacher pay for the licence and attending seminars themselves in spite of their difficult economic situation and low income. On the other hand, poor equipment of schools with teaching aids, classrooms and laboratories, as well as the poor offer of seminars on school experiments, definitely reflect on the realisation of experimental teaching.

### ***Activities to further improve professional education of teachers***

Apart from numerous problems concerning funding, lack of teaching aids, organisation of experimental teaching, the social status of teachers, realisation of seminars, a number of activities could be undertaken with the aim of further developing and improving the education of teachers and professional staff in Serbia. In order to improve further professional education of teachers, it is necessary to change, introduce and conduct the following activities:

- increasing the number of seminars within science teaching - chemistry; physics and biology;
- increasing the number of seminars on experimental science teaching;
- establishing a network of centres in cooperation with colleagues abroad in order to improve the quality of science teaching;
- establishing independent school laboratories at regional centres;
- intensifying cooperation between schools in Serbia and abroad, as well as cooperation with universities abroad: a lecture conducted in 2013 in cooperation between the Working Group: Didactics of Chemistry at the University Jena and the Regional Centre Nis - an alternative model of teacher professional development and the organisation of the international conference with the ATEE.

### **Concluding remarks**

The main aim of this paper is to present, not only today's school system and educational institutions in Serbia, but also the fact that, in spite of numerous problems such as difficult financial situation and poor equipment, there is enormous potential in the education system of Serbia, consisting of: teaching staff, accepting and implementing new ideas in the teaching process, as well as intensive cooperation among teachers, and domestic and foreign educational institutions. Moreover, the ideas and innovations within further teacher training originate from school practice and numerous teachers, through cooperation between academic institutions in Serbia and similar institutions abroad (such as the Regional Teaching Training Centre-Nis and ATEE). Compared to the period before 2001, professional and vocational education of teachers in Serbia today is based on modern and democratic statutory provisions. It is primarily evident in a huge number of

different educational programmes, seminars, workshops, projects, public lectures within schools or outside of them. However, the entire preparation and professional exams (the licence) are still very complex and bureaucratic, and have not essentially changed compared to the statutory provisions from the time of the former Yugoslavia. The solution of this problem lies in the decentralisation of school governance, change of statutory provisions (exam regulations) and founding, the new independent and modern educational institutions for teacher training. The engagement of foreign higher education institutions would certainly contribute to achieving this objective, through a number of joint projects together with the Serbian education institutions. That is confirmed by the example of the organisation of the school the workshop realised through the cooperation of schools in the city of Nis, the Regional Centres in Nis and the Teaching group for didactics of chemistry of the University of Jena in 2013 (Bilten RC-Niš 2013 1 and 2).

### Implications for teacher education

Although the organisation and conducting of professional training of teachers of natural sciences in Serbia today show both advantages and disadvantages, several crucial implications for teacher education could be pointed out. First of all, school laws, norms, standards and licence exam legally define modern teacher education based on democratic principles and equal rights for everyone in the education process. The alternative forms of further teacher training School Development Programme and Self-evaluation represent the foundation for independent development of schools, various school programmes, cooperation with other institutions - all according to the needs and resources of school institutions. The newly introduced standards of competencies are defined for all areas of educational and pedagogical work, and seminar programmes. Regarding the organisation and conducting of seminars, the number of seminars within natural sciences on school experiments ought to be increased in order to improve the quality of experimental teaching. It is also necessary to reduce the number of accredited seminars since the current number is quite big when taking into consideration the ratio of the number of schools, teachers and students. In the field of cooperation between foreign and domestic school institutions, major progress has been made since 2001. Models and forms of professional education of teachers, developed equally through the participation of both local and foreign teachers and institutions, as well as innovations and ideas of teachers in Serbia, could in the future certainly be implemented in the programmes of vocational and professional teacher training in other European countries. This would bring and, at the same time, enable Serbian teachers to cooperate more actively with their European colleagues for further professional development. Approaching and the entry of Serbia into the EU in the near future would by all means considerably facilitate, intensify and broaden the cooperation between Serbian and European school institutions, from the school and education system, through teacher development and the realisation of seminars/workshops, to teaching standards and norms.

### References

- Bilten RC-Niš. 2013. January/February (1): 3. <http://www.rcnis.edu.rs/Za%20download/RegionalniCentar-Bilten01-JanuarFebruar2013.pdf>.
- Bilten RC-Niš. 2013. April/March (2): 16. <http://www.rcnis.edu.rs/Za%20download/RegionalniCentar-Bilten02-MartApril2013.pdf>.
- Bojović, S. 2009. *Hemija u gimnazijama u Srbiji u XIX i XX veku*. Beograd: Hemijski Fakultet Univerziteta Beograd.
- Bojović, S., and D. Šišović. 1993. "Stručna analiza srednjoškolskih udžbenika hemije." *Nastava i Vaspitanje* XLII (5): 279- 289.
- Bojović, S., and D. Šišović. 1999. "Stavovi učenika prvog razreda gimnazije prema nastavi hemije." *Nastava i vaspitanje* XLVIII (3- 4): 352- 353.
- Bojović, S., and D. Šišović. 2003. "Individulano i grupno proveravanje znanja hemije na početku prvog razreda gimnazije." *Nastava i vaspitanje* LII (2-3): 193- 195.

- Bojović, S., and D. Šišović. 2005. “Usmereno obrazovanje i promene u nastavi hemije.” *Nastava i vaspitanje* LIV (1): 43- 67.
- Čalija, J. 2012. “Počinje škola ostali problem.” *Politika*, September 2. <http://www.politika.rs/rubrike/Tema-nedelje/Kakvo-nam-je-osnovnoobrazovanje/Pocinje-skola-ostali-problemi.lt.html>.
- Gavrilović, I. 2013. “Prosvetari traže bolje uslove rada i veće plate.” *Blic*, May 5. <http://www.blic.rs/Vesti/Beograd/383665/Nastavnici-i-profesori-traze-bolje-uslove-rada>.
- Ilić, J. 2010. “Komisija pravi planove za polaganje male mature.” *Blic*, January 2. <http://www.blic.rs/Vesti/Drustvo/173233/Komisija-pravi-plan-za-polaganje-male-mature>.
- Katalog programa stalnog stručnog usavršavanja nastavnika, vaspitača i stručnih saradnika za školsku 2012/13 i 2013/14. *Kompetencija za oblast prirodne nauke*. 13 July. <http://katalog.zuov.rs/Default.aspx?oblast=27#kompetencije>.
- Katalog programa stalnog stručnog usavršavanja nastavnika, vaspitača i stručnih saradnika za školsku 2012/13 i 2013/14. *Standardi kompetencija za profesiju nastavnika i njihovog profesionalnog razvoja*. <http://katalog.zuov.rs/StandardiKompetencija.aspx>.
- Leko, I. 1968. *Učenička samouprava*. Zagreb: Naprijed.
- Osnovna Škola “Sveti djakon Avakum”. 2010. “Predmeti i fond časova”. *Ostrnava.edu.rs*. Accesed 8 September. <http://www.ostrnava.edu.rs/predmeti.html>.
- OŠ “Sveti Sava” Kikinda. n.d. *Učenički parlament*. <http://svetisava.edu.rs/index.php/ucenici/ucenicki-parlament>.
- Pravilnik o obrazovanju i sastavu komisije, uslovima, mjestu, načinu i postupku polaganja stručnog ispita nastavnog i vaspitnog osoblja (“*Sl. list RCG*”, br. 21/88, 9/96). [http://www.seeeducoop.net/education\\_in/pdf/prav\\_o\\_obraz\\_i\\_sest\\_kom\\_za\\_polag\\_struc\\_ispit-yug-mon-srb-t04.pdf](http://www.seeeducoop.net/education_in/pdf/prav_o_obraz_i_sest_kom_za_polag_struc_ispit-yug-mon-srb-t04.pdf).
- Pravilnik o ocenjivanju učenika u osnovnom obrazovanju i vaspitanju (“*Sl. glasnik RS*”, br. 67/2013). <http://www.mpn.gov.rs/dokumenta-i-propisi/podzakonskipropisi/obrazovanje-i-vaspitanje/893-pravilnik-o-ocenjivanju-ucenika-u-osnovnom-obrazovanju-i-vaspitanju>.
- Pravilnik o dozvoli za rad nastavnika, vaspitača i stručnih saradnika (“*Sl. glasnik RS*”, br. 22/2005 i 51/2008). <http://de.scribd.com/doc/187412365/Pravilnik-o-Dozvoli-Za-Rad-Nastavnika-Vaspitaca-Strucnih-Saradnika>.
- Pravilnik o stalnom stručnom obrazovanju nastavnika, vaspitača i stručnih saradnika (“*Sl. glasnik RS*”, br. 13/2012). [http://inkluzivno-obrazovanje.rs/files/Pravilnik\\_strucno\\_obrazovanje.pdf](http://inkluzivno-obrazovanje.rs/files/Pravilnik_strucno_obrazovanje.pdf).
- RC-NIŠ. 2014. *Aktivnosti centra*. <http://www.rcnis.edu.rs/19-showcase/71-aktivnosti-centra>.
- Školski razvojni plan OŠ “Jelena Četković”. 2012–2015. <http://www.jelena.edu.rs/Skolski%20razvojni%20plan%202012-2015%20sa%20akcionim%20planom%20za%202012-13%20-%20OS%20Jelena%20Cetkovic.pdf>.
- Thüringer Schulportal. 2009. *Lehrplan Mensch - Natur - Technik (MNT), Regelschule*. <https://www.schulportal-thueringen.de/media/detail?tspi=1391>.
- Vajgand, Dj. 1971. “Projekti nacionalne naučne fondacije SAD.” *Hemijski pregled* 12 (5–6): 201.
- Zavod za unapredjenje obrazovanja i vaspitanja. n.d. *Nastavni planovi i programi za osnovne i srednje škole*. <http://www.zuov.gov.rs/dokumenta/CRPU/Planovi%20gimnazije%20PDF/1%20Nastavni%20plan%20za%20gimnazije%20svi%20smerovi.pdf>.
- Zavod za vrednovanje kvaliteta obrazovanja i vaspitanja. n.d. *Okvir za samovrednovanje za ustanove u stručnom obrazovanju*. <http://www.ceo.edu.rs/novost/27-okvir-za-samovrednovanje-za-ustanove-u-strucnom-obrazovanju>.

Back to contents



## What do we mean by multicultural awareness?

*Morten Løvteit & Liv Susanne Bugge*

*Hedmark University College, Norway*

morten.lotveit@hihm.no & liv.bugge@hihm.no

### Abstract

As teachers and teacher educators we face the challenge of teaching adequately in multicultural classrooms and kindergartens. In this context, student teachers' attitudes towards and experiences with cultural diversity are important. We are currently carrying out a research project on student teachers' multicultural awareness at a Norwegian university college. This paper discusses the meaning of multicultural awareness, the central theoretical concept of the project. There exist different definitions of the concept and different ways of relating it to other theoretical concepts. In this paper we discuss, among other things, how the concept may be related to attitudes, knowledge and skills, and to concepts such as intercultural awareness, critical awareness and intercultural competence.

**Keywords:** multicultural awareness; intercultural competence; teacher education; kindergarten teacher education.

### Introduction to the topic

Increased migration over a number of years has contributed to the development of modern multicultural societies, including multicultural classrooms and kindergartens. Teachers and teacher educators face a need to develop forms of teaching that are adapted to the cultural diversity of their classrooms and kindergartens. In order to do so, teacher educators should, among others things, explore the relevant attitudes, experiences, knowledge and skills of teacher candidates. This is why we are currently carrying out a research project about student teachers' multicultural awareness at a Norwegian University College. After presenting the project briefly, the core concept of the project, multicultural awareness, will be discussed.

In our project we raise three main questions: What kind of multicultural awareness may be found among novice student teachers? Do changes take place in student teachers' multicultural awareness during their stay at a Norwegian university college, in our case at Hedmark University College in eastern Norway? We will seek to answer this question by comparing students' answers to a structured questionnaire in the first and in the third year of their study. Our third question regards whether there are noticeable differences among students with and without study periods abroad. In order to develop more nuanced results than may be obtained with quantitative research methods alone, we will also carry out qualitative research in the form of unstructured interviews with a limited number of student teachers.

In Norwegian teacher education, the development of multicultural awareness is an important objective. This concerns both Kindergarten Teacher Education and General Teacher Education (Ministry of Education and Research 2012; 2010). What is the background of the multicultural dimension of the Norwegian curriculum regulations? There are slightly more than 5 million people living in Norway, of which 77% are born in Norway with two Norwegian-born parents and four Norwegian-born grandparents. In a European perspective, the population of Norway is increasing at a comparatively high rate (by 1.3% in 2012). Most of this growth (72%) is due to immigration (Kvarv Andreassen, Dzamarija, and Slaastad 2013).

The campus of teacher education at Hedmark University College is located in Hamar, an inland town of some 27,000 inhabitants in the county of Hedmark. The college recruits students mostly from the inland counties of Oppland and Hedmark. Compared to Oslo and some other parts of Norway, the immigrant population of these counties is small. While the immigrants constituted 23% of the population in Oslo and 11% of the population in Norway as a whole in 2012, Hedmark and Oppland had an immigrant population of about 7% (Høydal 2013). There are, however, clear

indications that immigrants now are spreading out from central areas into smaller municipalities (Østby and Henriksen 2013).

Inhabitants in many of the small and peripheral municipalities, we must assume, still have limited experiences in communicating with immigrant populations. Teacher students at Hedmark University College, who are almost all white and for the most part of Norwegian descent, come from various localities. In the planning of this project, we have assumed that previous experiences with cultural diversity among the teacher students may vary to a large extent. As will be seen further below, this is important for the way in which we approach the concept of multicultural awareness and it constitutes an important reason why we choose to use this as our core concept.

### **The aims of argument**

The aim of this paper is to discuss how multicultural awareness may be conceptualised and related to other relevant concepts. What do we mean by multicultural, and what do we mean by awareness? How should multicultural awareness be distinguished from and related to concepts such as critical awareness, intercultural awareness or intercultural competence? To what degree should awareness be related to attitudes? To what degree should it be related to knowledge or skills? These are among the questions that will be raised.

### **Theoretical argument**

Concepts are in themselves neither true nor untrue. They may be defined and understood in different ways. It is our sense of the usefulness of certain concepts applied in certain ways that matter. While this is important to underline, we are also parts of a scholarly community. We need to use and develop conceptual frameworks that are meaningful to this community. Different scholars, nevertheless, may apply the same concepts for different purposes or in different circumstances. These purposes and circumstances may to some degree influence or determine the definitions and understandings of the concepts they use. In our case, we need to develop an understanding of multicultural awareness for a particular research project. Our procedure is basically to discuss various definitions and conceptual understandings of multicultural awareness in relation to each other, in relation to other closely related concepts, and in relation to the perception we have of their usefulness for our project.

### ***Multicultural education***

Before turning to definitions of multicultural awareness, it may be worthwhile to relate the concept to multicultural education in general. There are a number of different approaches to and understandings of how multicultural education should be constructed and what its goals should be. Castagno (2009) highlights a number of different understandings and notes that there is a lack of consensus in the field. She analyses various approaches to multicultural education in the scholarly literature in terms of their goals, and ends up with the following division: 1) educating for assimilation, implying that “diversity is either ignored or perceived as a threat to the current social order” (43); 2) educating for amalgamation, meaning a “process whereby all groups “melt” to form a completely new culture” (45); 3) educating for pluralism, which means that the aim is to create “a social and cultural context in which multiple cultural groups co-exist and where diversity is valued” (45); 4) educating for cross-cultural competence, which imply that “students acquire the knowledge and skills necessary to function in both their own and another's cultures” (46); 5) educating for critical awareness, which highlights “increased understanding of power, privilege, and oppression within and between groups,” (46) and 6) educating for social action, which appears to be quite similar to the last mentioned approach, but which also “requires that students act to effect social change.” (47). Castagno herself does not consider the majority of the approaches she outlines to be genuine approaches to multicultural education, but rather approaches to education. To her, only the last category, educating for social action, is a genuine approach to multicultural education, a point of view that may be considered rather exclusive. Even though some of the

approaches she outlines are incompatible with each other, it may be argued that not all of them are. It could be interesting to explore how, for example, her approach no. 3, educating for pluralism, may be combined with or related to her approach no. 5, educating for critical awareness. In any event, Castagno’s findings may remind us that concepts such as multicultural awareness, intercultural awareness, or intercultural competence do not exist in a pedagogical vacuum. They should, in the end, be related to the fundamental objectives of our educational efforts, even though such a discussion is not the subject of this paper.

### *Different understandings of multicultural awareness*

What is multicultural awareness? One way of understanding the concept is as follows: “Multicultural awareness involves openness to learning about differences associated with various cultures and being conscious of biases and assumptions we hold and the impact they have on individuals different from ourselves” (Gayles and Kelly 2007, 194). Three components are highlighted: a) Openness to learning about cultural differences; b) consciousness about one’s own biases and assumptions; and c) consciousness about how one’s own biases and assumptions impact on individuals different from us. This understanding is valuable in so far as it highlights openness towards others as well as reflections about one’s own consciousness, points on which a number of scholars probably would agree. However, the third aspect, how one’s own biases and assumptions impact on individuals different from ourselves, may be problematic. If you become conscious about your own biases, we must assume that you may question or modify the biases in question. A consequence may be that you change your mind or that you avoid expressing the biases. If you do not hold the same biases as before, or if you do not express them, it may be difficult to perceive how they affect others. Furthermore, in order to understand how others may be affected by your biases, you will need to know what your own biases may look like from their point of view. In order to do so you will need to develop a basic understanding of their worldview. Ideally, you should be able to evaluate how expressions of your own biases and assumptions could or would be perceived and apprehended by a person with a different worldview. However, with such a sophisticated consciousness in mind, it could be argued that you are no longer likely to hold or express the biases or assumptions you may previously have held. A basic problem with Gayles and Kelly’s understanding of multicultural awareness, apart from its dubious consistency, is that it seems to presuppose a level of consciousness that may only be achieved after a rather prolonged process of gathering consciousness.

Despite these observations, Gayles and Kelly’s conceptualization of multicultural awareness may, with modifications, be useful. We could retain the formulation of “openness to learning about differences associated with various cultures” (2007, 194). The next aspect, “being conscious of biases and assumptions we hold” (2007, 194) may be reformulated as “being willing to learn about biases and assumptions we hold.” The third aspect, “being conscious of... the impact they [the biases and assumptions] have on individuals different from ourselves” (2007, 194) may be reformulated as “being willing to explore how our biases and assumptions may be expressed and seek to understand the impact they may have on individuals different from ourselves.” In addition to being more consistent, such a reformulation would also tend to be more inclusive to culturally open-minded individuals who not necessarily have developed any sophisticated consciousness about intercultural relations. This may be especially important with regard to many student teachers in the western world.

Another definition of multicultural awareness has been presented by Pope and Reynolds (1997, 270):

“Multicultural awareness consists of the attitudes, beliefs, values, assumptions, and self-awareness necessary to serve students who are culturally different from oneself (Pedersen, 1988). Individuals may have an inaccurate or inappropriate awareness of culture (i.e. stereotypes, biases); those false attitudes and assumptions must be changed before multicultural development can continue (Pedersen 1988; Pope-Davis and Dings, 1985; Sue et al., 1982)”.

Multicultural awareness is here defined in terms of attitudes, beliefs, values, assumptions, and self-awareness. Knowledge and skills are, at least in analytical terms, additional competencies,



or additional aspects of multicultural competence in Pope and Reynolds’ model. It is also interesting to note that Pope and Reynolds regard it as necessary to change certain attitudes and assumptions before multicultural development can continue. Multicultural awareness is thus considered as a developmental process rather than as a condition or a quality.

There are both similarities and differences between the two abovementioned definitions. Both relate multicultural awareness primarily to individuals’ ideas about and attitudes towards people of different cultural backgrounds. Both also highlight the necessity of becoming aware or conscious about one’s own ideas and attitudes in this respect. Gayles and Kelly (2007, 194) address the need for consciousness about “the impact ... [the biases and assumptions we hold] have on individuals different from ourselves.” This aspect is not explicitly mentioned in Pope and Reynolds’ definition. One apparent difference between the two is that Gayles and Kelly’s definition presupposes a quite sophisticated consciousness, while Pope and Reynolds’ definition appears to be more subdued in this respect (“the attitudes, beliefs, values, assumptions, and self-awareness necessary to serve students who are culturally different from oneself” [1997, 270]). One clear difference between the two definitions is that Gayles and Kelly describe awareness as a condition or a quality, while Pope and Reynolds describe it as a developmental process. As indicated above, however, it may be argued that Gayles and Kelly’s definition implicitly presupposes a preceding process of gathering consciousness.

In a seminal paper by Sue and other U.S. psychologists, dating back to 1982, cultural competencies were divided as follows: 1) “attitudes/beliefs”, with focus on one’s own cultural background, beliefs, attitudes, and values; 2) “knowledge”, with focus on knowledge and understandings of worldviews different from one’s own; 3) “skills”, with focus on the ability to act and communicate appropriately in intercultural contexts (Sue et al. 1982). This conceptual framework was further developed and explained in a later paper by Sue and his colleagues (Sue et al. 1992). In 2001, Sue referred to the first of the abovementioned components as awareness of attitude/beliefs, and he referred to a number of instruments based on this conceptual model in which “cultural” frequently had been substituted with “multicultural”. Sue also listed the following beliefs/attitudes as parts of his competency model:

- “1) Aware and sensitive to own heritage and valuing/respecting differences.
- 2) Aware of own background/experiences and biases and how they influence psychological processes.
- 3) Recognizes limits of competencies and expertise.
- 4) Comfortable with differences that exist between themselves and others.
- 5) In touch with negative emotional reactions towards racial/ethnic groups and can be nonjudgmental.
- 6) Aware of stereotypes and preconceived notions.
- 7) Respect religious and/or spiritual beliefs of others.
- 8) Respect indigenous helping practices and community networks.
- 9) Values bilingualism” (Sue 2001, 799, table 1).

What Sue and his colleagues developed was a model of multicultural competence for the counselling profession in the United States. We may learn from this model, but we need, in the end, to develop an understanding of multicultural awareness that is adapted to our own needs as professional teacher educators.

### ***Multicultural awareness, intercultural awareness, and intercultural competence***

Multicultural awareness, like a related concept, intercultural awareness, is often considered to be one among three or more components in various human competence models, most particularly in models of intercultural competence. According to Spitzberg and Changnon (2009, 7):

“At least since the 1950s, an intuitive, if somewhat Kantian, conative approach has dominated models of human competence (Bloom, 1956; Havighurst, 1957) consisting of the following core components: “motivation” (affective, emotion), “knowledge” (cognitive), and “skills” (behavioral, actional). To incorporate the broader set of influences on human competence, Spitzberg and Cupach (1984) expanded the conceptualization to include “context” (situation, environment, culture, relationship, function) and “outcomes” (e.g., perceived appropriateness, perceived effectiveness, satisfaction, understanding, attraction, intimacy, assimilation, task achievement). To a large extent, all theories and models of intercultural competence rely extensively on these basic conceptual metaphors to guide their explanations (e.g., Gertsen, 1990; Lustig and Koester, 2006; Spitzberg, 1997; Sue, 2001).”

As regards intercultural competence and intercultural communication competence, Spitzberg and Changnon point out that many relevant theories and models have been proposed. In their review of the field, they divide models of intercultural communication competence into the following types: compositional models, which basically “identify the hypothesized components of competence without specifying the relations among those components;” co-orientational models, focusing on “communicative mutuality and shared meanings;” developmental models, which specify “stages of progression or maturity through which competence is hypothesized to evolve;” adaptational models, which often focus on the interdependence and mutual adjustment of multiple interactants in intercultural settings; and finally causal process models, which “reflect fairly specified interrelationships among components” and which most easily may be “translated ... into testable propositions” (Spitzberg and Changnon 2009, 10).

A particularly interesting model has been presented by Deardorff (2006). On the basis of a Delphi study among a group of experts on intercultural competence, she developed a visual pyramid model in which “Requisite attitudes” at the bottom of the construct, like “Respect;” “Openness;” and “Curiosity and discovery” lay the foundation for developing “Knowledge & Comprehension” and “Skills”. In the “Knowledge and Comprehension” category, she lists “Cultural self-awareness; Deep understanding and knowledge of culture; Culture-specific information; Sociolinguistic awareness.” In the skills category she lists “To listen, observe, and interpret,” and “To analyse, evaluate, and relate.” Arrows in the visual model indicate that the development of knowledge and comprehension on the one hand, and skills on the other, are expected to influence each other. The combination of the attitudes, knowledge, comprehension and skills mentioned then may lead to the “Desired Internal Outcome ...” expressed as “Adaptability (to different communication styles & behaviors; adjustment to new cultural environments); Flexibility (selecting and using appropriate communication styles and behaviors; cognitive flexibility); Ethnorelative view; Empathy.” The attitudes, knowledge, comprehension and skills, as well as the desired internal outcome mentioned, may eventually lead (at the top of the pyramid) to the “Desired External Outcome” which involves “Behaving and communicating effectively and appropriately ... to achieve one’s goal to some degree” (Deardorff 2006, 254, Figure 3).

It should be noted that in this model some qualities (the relevant attitudes) are regarded as more basic or foundational than others. The pyramid model envisions how different competencies may be related to each other, and gives us a broad outline of how they may develop in stages. Rather than a compositional model, this is a developmental model of intercultural competence. As Deardorff herself points out, the model “allows for degrees of competence” (2006, 255). She also adds: “Given that the aspects within each of these areas in the model are still broad, each aspect can be developed into more specific measurable outcomes and corresponding indicators, depending on the context” (Deardorff 2009, 477).

Deardorff does not use the term multicultural awareness. However, she understands intercultural awareness to mean “the cognitive aspects of understanding cultural differences” (Deardorff 2006, 249, table 2). Here, as will be indicated below, our point of view is somewhat different. She points out that there was consensus (more than 80% agreement) among the experts she consulted that intercultural awareness should be reckoned as an integral part of intercultural competence. The same goes for “Cultural self-awareness and capacity for self-assessment,” “Respect for other cultures,” “Cross-cultural empathy,” “Sociolinguistic competence (awareness of relation between language and meaning in societal context),” just to mention a few (249-250, table 2).

Gayles and Kelly’s understanding of multicultural awareness involves both attitudinal (“openness to learning about differences”) and cognitive (“consciousness about ...”) aspects (2007, 194). Pope and Reynolds’ model (1997) focus on the attitudinal aspects. Sue (2001) quite clearly relates awareness to beliefs/attitudes. Deardorff (2006), on the other hand, places cultural self-awareness, sociolinguistic awareness as well as intercultural awareness in the cognitive (knowledge and comprehension) category. Semantically, however, there may be good reasons to place “awareness” at the intersection of attitudes and cognition. According to Webster’s Third New International Dictionary (2014), “awareness” means “the quality of being aware,” and to be

“aware” can mean to be “showing heightened perception and ready comprehension and appreciation” of something or somebody. According to Oxford Advanced Learner’s Dictionary (2014), “awareness” means “knowing... [something]; knowing that... [something] exists and is important, being interested in... [something].” To situate “awareness” at the intersection of attitudes and cognition, in the sense that it involves elements of both, may be problematic in relation to models with clear distinctions between attitudinal, cognitive and behavioural competence elements. Still, an understanding of multicultural awareness as being at the intersection of attitudes and knowledge may point to an important part of the process of developing multicultural or intercultural competence, that is to say the point at which the realisation that multicultural society exists leads someone to be interested, ask questions, develop ideas and acquire knowledge about one’s own and others’ cultural backgrounds. Iverson (2012, 69) writes:

“While some posit that awareness is a prerequisite for developing multicultural competence... I view awareness as inextricably linked to the development of knowledge. Such awareness involves the self-reflexive work through which individuals (might) unpack their identities, reveal their blind spots, and interrogate the givenness of what they know.”

In this sense, multicultural awareness may be regarded as a form of critical self-reflection which is linked to development of knowledge. Multicultural awareness, however, should not be limited to self-reflection. It should, at the least, include openness and curiosity towards the culturally others as well. A somewhat similar position may be seen in a text by Fantini and Tirmizi (2006), according to which intercultural competence includes four main components: knowledge, attitudes, skills, and awareness. To Fantini and Tirmizi, it seems, the awareness component is closely related to a person’s ability to observe and reflect in an intercultural setting.

Multicultural as a concept refers to the existence of various cultures or to cultural variety. Multicultural awareness may mean the degree to which we perceive and the manner in which we seek to categorise, describe, interpret and understand cultural differences and similarities. Some, however, may favour the concept of intercultural awareness to multicultural awareness. There are clear differences between the two. As indicated by Bolten, there are normally considerable differences between the way people interact within their own cultural group and the way they interact with people of other cultural groups. “This is due to the interdependence of “self-image”, “image of the other” and “meta-image” (judgement of other’s opinion of oneself)” (Bolten 1993, 342). Multicultural awareness has to do with being aware of the existence of cultural diversity and of different modes of intracultural interaction. Intercultural interaction takes place in a different setting and without the relatively clear-cut norms guiding intracultural interaction. According to Bennett (2013, 5):

“Intercultural communication is necessarily more “intentional” than monocultural communication. We normally think of communication as something natural, like walking... But across cultural contexts, unconscious communication is generally ethnocentric and ineffective. To be successful, such communication must be practised with one’s consciousness fully engaged. Since it is a relatively unusual condition for most human beings, we could say that intercultural communication is essentially unnatural.”

Multicultural awareness is certainly important in order to develop intercultural awareness, and the latter represents in this sense a more advanced level than the former. We understand intercultural awareness to be primarily concerned with interaction in intercultural settings. It would perhaps be more pertinent to highlight intercultural rather than multicultural awareness. However, the student teachers we are focusing on have, we assume, quite different degrees of contacts with and varied forms of relationships with people of other cultural backgrounds. We therefore prefer to start out with the more basic of the two concepts, i.e. multicultural awareness.

Multicultural awareness is not simply a descriptive concept. It is a normative concept as well. Multicultural awareness includes processes of perceiving and understanding one’s own cultural background and those of people with other cultural backgrounds that are conducive to mutual understanding and fruitful interaction. The concept may, furthermore, be related to the broader concept of multiculturalism, which, according to Rattansi (2011, 8):

“has never been about encouraging separation and segregation. It has involved the creation of structures

in which the incorporation of immigrants and ethnic minorities occurs fairly and with the recognition that the desire of the immigrants and minorities to retain aspects of their cultures is reasonable, and that cultural diversity is itself desirable and benefits the nation in a variety of ways. Also ... it has an equal opportunities and anti-discriminatory strand that is often ignored in debates about the meaning and effectiveness of multiculturalism.”

Returning to Deardorff (2006, 254, figure 3), how can we understand the concept of multicultural awareness in relation to her model? To put the question differently: What in her model may be included in our conception of multicultural awareness? What may be excluded? Attitudes such as respect, openness, curiosity and discovery fit well into the concept of multicultural awareness as it has been discussed so far. Parts of the qualities Deardorff lists under knowledge may also be included in the concept of multicultural awareness. Cultural self-awareness seems to be fundamental to any awareness of the culturally other. Sociolinguistic awareness may also be considered as an aspect of multicultural awareness, although it needs further specification. Culture-specific knowledge, and deep cultural knowledge including understanding other world views, is something which a multiculturally aware person or group probably would be aiming for, although he, she or it may only be in the process of developing these kinds of knowledge. Finally, a multiculturally aware person or group would, as indicated by the experts Deardorff is referring to, also see, or at least begin to see the importance of understanding the world from others’ point of view.

#### *Critical multicultural awareness*

This perspective may be expanded. Castro’s point of departure, for example, is what he calls critical multiculturalism. He writes: “Critical multiculturalism strives to bring about the transformation of society to accomplish the goals of social justice by confronting and disrupting institutions and the structures of power that maintains disparities across race, class, and gender” (Castro 2010, 199). Iverson is concerned that multicultural competencies (among them, multicultural awareness) may serve to maintain social inequalities rather than to promote social justice. She therefore addresses “the need to expand dominant conceptualizations of multicultural knowledge, awareness, and skills to develop equity-minded and privilege-cognizant practitioners who have the capacity to extend their awareness into action and advocate for social justice ...” (Iverson, 2012, 63). Structures of power and social relations are thus highlighted and regarded as crucial to our conceptualisation of multicultural society and of multicultural competence. This may be read as follows: Different groups have different access to benefits and positions in society. Culturally diverse groups are not only culturally diverse, but they also often find themselves in socially different positions. Particular cultural groups may in many instances be despised, discriminated against, ignored or oppressed. Without understanding politics and social structures, there can be no profound understanding of culturally diverse groups. For all the worth of Castro and Iverson’s critique of socially blind cultural openness, however, it may be useful to carefully consider when and where it is worthwhile to let the social rather than the cultural dimension of sociocultural relationships be at the centre of our attention. Here we must take both the contexts and the particular multi- or intercultural dynamics we are studying at any given time into consideration.

From a somewhat different perspective, Hoffman has argued that “current conceptualizations of multiculturalism lack a critical self-awareness about their own assumptions regarding such basic concepts as culture, self, identity, and difference” (Hoffman 1996, 546). She starts out by presenting four different kinds of critique of multiculturalism. The first is the conservative critique concerned with issues of political and social fragmentation. A second more research-based critique delves into how programs or practices in multicultural education fail to live up to stated goals or expectations. A third kind of critique “takes issue with the increased normatization of multicultural discourse and its resultant failure to reinvent or confront established categories of knowledge or relations of power” (547), for example by emphasizing the importance of individual attitudes rather than addressing structural or institutional issues. More frequently, this kind of critique focuses on “the ways in which obsessive concern with culture masks the political and socioeconomic

conditions that contribute to real inequity in contemporary plural societies - thereby making multiculturalism a safe way of sidestepping the important issues” (548). This seems to be a critique close to Castro and Iverson’s heart. A fourth kind of critique is what Hoffman calls “symbolic or interpretive, in that it seeks to identify the underlying assumptions, meanings, and orientations of multiculturalist discourse and practice” (548-549).

Hoffman (1996) criticizes what she regards as a tendency in the multicultural education literature to regard cultures as discreet units and distinct wholes that determine human perceptions and behaviour and to “ignore the realities of fuzzy borders and mutual interface and interdependency” (550). There are, she believes, even though many multiculturalists may dislike it, a number of more or less essentialist tendencies in multicultural educators’ approaches to non-Western cultures. The culturally other may be portrayed as both totally different and as taking part in a common human experience. A second critique of how culture has been conceptualized in multicultural education literature relates to what Hoffman calls “Culture as Category” (551). This implies that cultures are presented more or less schematically, and out of context, as consisting of a number of components, such as food, music, clothes, etc. The meanings and values behind the various phenomena and practices that are listed and the contexts in which they exist are often ignored.

Hoffman also discusses how identity is addressed in multicultural education research and discourse. She underlines that notions of identity may differ among cultures and ethnic groups. Yet, American education research and discourse often take the assumed universality of Western-centric understandings of self for granted. Hoffmann also points to a related assumption, according to which there is “basically a one-to-one relation between self and culture characterized by a clear, fixed, commitment to a particular cultural and ethnic identity” (1996, 557). This leaves very little room for flexibility, doubts, hybrid constructions, or grey zones, as they are experienced in the real world.

What relevance may Castro, Iverson, and Hoffman’s findings have for our conceptualization of cultural awareness? Castro and Iverson’s texts may help us to focus on the political, institutional and socioeconomic dimensions of multicultural societies. Furthermore, Castro highlights what he regards as a relatively high degree of continuity with regard to student teachers’ lack of insight into how structural forces affect relations between individuals and groups of different ethnic and cultural backgrounds. Hoffman’s findings may serve as a warning against naive, simplistic and celebratory models of multicultural education. Second, rather than to invite us to promote some sort of “political correctness,” Hoffman invites us to explore our own conceptualizations of culture and identity critically. She is particularly insistent that we should look out for how some western scholars (unconsciously?) tend to put culture-specific content into their understanding of how intercultural interaction works or ought to work. She also invites us to explore cultural variations as they are expressed in daily practices without expecting any neat symmetry between cultural background and identity to occur.

### **Concluding remarks**

We regard multicultural awareness as a part of a larger competence construct, intercultural competence, involving (at the least) attitudes, knowledge and skills that are necessary in order to develop effective and reciprocally satisfactory interaction between individuals and groups of different cultural backgrounds. In relation to the various aspects of intercultural competence, we locate awareness at the point of intersection of attitudes and knowledge. We believe Dearthoff (2006) is correct in assuming that attitudes are foundational to the development of intercultural competence. In our view, attitudes are also foundational to the development of multicultural competence. Awareness involves attitudes and emotions, but it also involves cognitive processes related to curiosity, questioning, and self-reflection. As such it may metaphorically be regarded as a bridge between attitudes and knowledge. On the one hand, awareness requires openness and empathy in relation to the culturally other, and a willingness to look at one's own cultural predispositions from the outside (attitudes). On the other hand it also requires reflection and

observation, self-reflection in particular, which may make us learn more about our own culture and/or those of others (development of knowledge).

There is an important difference between multicultural and intercultural awareness. Multicultural awareness regards openness towards the culturally other and interest, curiosity, and reflection about similarities and differences between groups or individuals of different cultural backgrounds. Intercultural awareness includes multicultural awareness, as well as an ability to observe and reflect on the way individuals and groups of different cultural background interact with each other. Due to regional particularities of the student teachers of our university college, we find multicultural awareness to be a more appropriate concept than intercultural awareness for our research project.

We may furthermore distinguish between a form of multicultural awareness that basically focuses on cultural differences and similarities, and one that in addition focuses on social and political structures, and take notice of how such structures influence or determine relationships between different sociocultural groups. This latter version is often called critical multicultural awareness. There are certainly good reasons to include considerations of social structures and political power in an understanding of multicultural awareness. At the same time, we should be careful not to minimize the cultural dimension of multicultural matters, or to reduce multicultural issues to social or political ones.

Finally, there are forms of multicultural awareness that involve essentialist or de-contextualized understandings of cultures, in which cultures often are regarded as relatively static, monolithic and distinguishable units. On the other hand, there are other forms of multicultural awareness in which cultures are regarded as dynamic, and in which emphasis often is put on subtle cultural differences and mixtures, grey zones and hybrid cultural expressions related to everyday practices in multicultural societies. We find the latter forms of multicultural awareness more interesting and promising than the former.

### **Implications for teacher education**

The development of multicultural societies, classrooms and kindergartens creates a need for developing adequate forms of multicultural education. The discussions in this paper have relevance for how we as teacher educators address questions related to multicultural education. The development of theoretically well-informed understandings of the field may help us avoid possible pitfalls in formulating programs or curricula of multicultural education. Furthermore, in order to develop multicultural education, knowledge about student teachers' multicultural awareness is vital. This paper has been written with the aim of serving as a theoretical basis for a research project that seeks to create knowledge about student teachers' multicultural awareness.

### **References**

- Bennett, M. 2013. *Basic concepts of intercultural communication: paradigms, principles, & practices*. Second ed. Boston: Intercultural Press.
- Bolten, J. 1993. “Life-world games: the theoretical foundation of training courses in intercultural communication.” *European Journal of Education. Cross-Cultural Competence in a Changing World* 28 (3): 339-348.
- Castagno, A. 2009. “Making sense of multicultural education: a synthesis of the various typologies found in the literature.” *Multicultural Perspectives* 11 (1): 43–48.
- Castro, A. 2010. “Themes in the research on preservice teachers' view on cultural diversity: implications for researching millennial preservice teachers.” *Educational Researcher* 39 (3): 198-210.
- Deardorff, D. 2006. “Identification and assessment of intercultural competence as a student outcome of internationalization.” *Journal of Studies in International Education*, 10 (3): 241-266.
- Deardorff, D. 2009. “Implementing Intercultural competence assessment.” In *The SAGE Handbook*

of *Intercultural Competence*, edited by D. Deardorff, 477-491. Thousand Oaks: SAGE Publications.

Fantini, A., and A. Tirmizi. 2006. “Exploring and assessing intercultural competence.” *World learning publications. Paper 1*. [http://digitalcollections.sit.edu/worldlearning\\_publications/1](http://digitalcollections.sit.edu/worldlearning_publications/1)

Gayles, J., and B. Kelly. 2007. “Experiences with diversity in the curriculum: implications for graduate programs and student affairs practice.” *NASPA Journal* 44 (1): 193-208.

Hoffman, D. 1996. “Culture and self in multicultural education: reflections on discourse, text, and practice.” *American Educational Research Journal* 33 (3): 545-569.

Høydal, E. 2013. “Innvandrerens bosettingsmønster: Innvandrere i bygd og by.” *Samfunnsspeilet* (2) 2013: 9-16. <http://www.ssb.no/befolkning/artikler-og-publikasjoner/innvandrere-i-bygd-og-by>

Iverson, S. 2012. “Multicultural competence for doing social justice: expanding our awareness, knowledge, and skills.” *Journal of Critical Thought & Praxis* 1 (1): 63-87. <http://lib.dr.iastate.edu/jctp/vol1/iss1/>

Kvarv A., K., Dzamarija, M., and T. Slaastad. 2013. “Innvandrere og norskfødte med innvandrerforeldre - befolkningsstatistikk: Stort mangfold i lille Norge.” *Samfunnsspeilet* 5: 13-19. <http://www.ssb.no/befolkning/artikler-og-publikasjoner/stort-mangfold-i-lille-norge>.

Ministry of Education and Research [Norway]. 2010. *Forskrift om rammeplan for grunnskolelærerutdanningene for 1-7. trinn og 5-10. trinn. FOR-2010-03-01-295*. <http://lovdata.no/dokument/SF/forskrift/2010-03-01-295?q=Forskrift+om+rammeplan+for+grunnskolel%C3%A6rerutdannin>. In English: <http://www.regjeringen.no/en/dep/kd/documents/legislation/regulations/2010/national-curriculum-regulations-for-diff.html?id=594357>

Ministry of Education and Research [Norway]. 2012. *Forskrift om rammeplan for barnehagelærerutdanning. FOR-2012-06-04-475*. <http://lovdata.no/dokument/SF/forskrift/2012-06-04-475?q=2012-06-04-475>

*Oxford Advanced Learner's Dictionary*. 2014. 8th edition (app edition), version 3.52.100. S.v. “awareness.” Oxford: Oxford University Press.

Pope, R., and A. Reynolds. 1997. “Student affairs core competencies: integrating multicultural awareness, knowledge, and skills.” *Journal of College Student Development* 38 (3): 266-277.

Rattansi, A. 2011. *Multiculturalism: A very short introduction*. Oxford: Oxford University Press.

Spitzberg, B., and G. Changnon. 2009. “Conceptualizing intercultural competence.” In *The SAGE Handbook of Intercultural Competence*, edited by D. Deardorff, 2-52. Thousand Oaks: SAGE Publications.

Sue, D., J. Bernier, M. Durran, L. Feinberg, P. Pedersen, E. Smith, and E. Vasquez-Nattall. 1982. “Position paper: Cross-cultural counseling competencies.” *The Counseling Psychologist* 10: 45-52.

Sue, D., P. Arredondo, and R. McDavis. 1992. “Multicultural counseling competencies and standards: a call to the profession.” *Journal of Counseling and Development* 70: 477-486.

Sue, D. 2001. “Multidimensional facets of cultural competence.” *The Counseling Psychologist* 29: 790-821.

*Webster's Third New International Dictionary, Unabridged*. 2014. S.v. “aware” and “awareness.” Merriam-Webster's Dictionary for iOS 3.57.90. Paragon Software Group, and Merriam-Webster, Inc.

Østby, L., and K. Henriksen. 2013. “Innvandrere og deres barn - og vår kunnskap om dem: Innvandrere - hva vi nå vet og ikke vet.” *Samfunnsspeilet* (5): 2-10. <http://www.ssb.no/befolkning/artikler-og-publikasjoner/innvandrere-hva-vi-naa-vet-og-ikke-vet>

Back to contents

## **The programming studio: investigating teachers’ readiness for teaching programming in the Island of Ireland**

*Pamela Cowan<sup>1</sup>, Elizabeth Oldham<sup>2</sup> & Ann FitzGibbon<sup>2</sup>*

*<sup>1</sup>Queen’s University Belfast, Northern Ireland & <sup>2</sup>Trinity College Dublin, Ireland*

P.Cowan@qub.ac.uk, eoldham@tcd.ie & annf2110@gmail.com

### **Abstract**

The issue of including programming in school curricula has recently returned to prominence in both Northern Ireland and the Republic of Ireland. The project “The Programming Studio” aims first to determine teacher readiness for teaching programming courses and then to facilitate pilot groups of teachers in mastering a programming language through games-based learning. This paper reports on the first aim. Using a questionnaire based on the Technology Acceptance Model (TAM), adapted to address programming, purposive samples of teachers from each jurisdiction were surveyed. The data were analysed to identify scales that might assess TAM-related constructs such as “perceived usefulness” of teaching programming and “image” associated with teaching the topic. Scores on the scales identified, and on other questionnaire items, were used to investigate teacher readiness. Findings point to a need for extended teacher education and to the necessity of developing or re-developing teachers’ professional identities as teachers of programming.

**Keywords:** programming; technology acceptance model; teacher development.

### **Context of the research**

After decades in which there has been little focus on the teaching and learning of programming in schools, the topic has returned to prominence. In some countries, attempts are being made to complement the use of digital technology in teaching and learning, and/or the teaching of ICT skills, by providing curricular opportunities for students to learn to program and to develop their computational thinking skills. This is the case in both Northern Ireland and the Republic of Ireland. However, in both jurisdictions, there are concerns about readiness of teachers to teach the relevant courses so that students reach suitable levels of understanding skill and for national certification.

The project “The Programming Studio” is addressing this problem. The chief aims of the project are:

- to document the levels of programming competency and readiness among teachers likely to be interested in teaching programming courses;
- to facilitate a pilot group of teachers experiencing programming as a “digital literacy” by mastering an appropriate programming language, or appropriate programming languages, through games-based learning.

This paper addresses the first aim.

In the first three sections of the paper, the theoretical framework provided by the Technology Acceptance Model (TAM) is discussed, the context in which the teaching of programming is now an issue in both jurisdictions is briefly outlined, and the relevant research question is stated. The fourth section describes the methodology, in particular the development, administration and analysis of a questionnaire asking respondents in purposive samples about their experience of programming, their view of the role of programming in the school curriculum, and their attitude to programming - the latter part being based on TAM. The fifth section reports first on identification of suitable TAM scales and then on findings for teachers in the two jurisdictions. Conclusions and implications for teacher education are offered in the final section. The questions of whether, and if so at what levels, programming should be included in school curricula - and hence discussion of rationales for its inclusion - are outside the scope of the paper.



## Research question

As indicated briefly in the Introduction, the first aim of The Programming Studio is to evaluate teachers' motivation, willingness, competency and self-efficacy towards programming and teaching school students to program. Thus, it was necessary to document the levels of programming competency and readiness to teach the topic among teachers likely to be interested in such teaching - described here for convenience as “prospective teachers of programming.” The corresponding research question is therefore: to what extent are prospective teachers of programming, in Northern Ireland and in the Republic of Ireland, able and willing to teach programming in schools?

## Theoretical framework

The theoretical framework underpinning the paper is the Technology Acceptance Model (TAM). It was introduced by Davis (1989) and subsequently refined and developed in particular by Venkatesh and Davis (2000) and Liu, Li and Carlsson (2010). According to Venkatesh and Davis (2000, 186–187):

“Numerous empirical studies have found that TAM consistently explains a substantial proportion of the variance (typically about 40%) in usage intentions and behavior.... TAM theorizes that an individual's behavioral intention to use a system is determined by two beliefs: perceived usefulness, defined as the extent to which a person believes that using the system will enhance his or her job performance, and perceived ease of use, defined as the extent to which a person believes that using the system will be free of effort. TAM theorizes that the effects of external variables (e.g., system characteristics, development process, training) on intention to use are mediated by perceived usefulness and perceived ease of use.”

The simplest form of the model is shown in the rectangular box labelled “Technology Acceptance Model” in Figure 1 below. The constructs Perceived Usefulness (PU) and Perceived Ease of Use (PEU) jointly affect a user's intention to use a system (Behavioural Intention, BI), with this in turn impinging on Usage Behavior. Moreover, as a system that is easy to use is more useful than one that is not, PEU impinges on PU.

The simple model has been expanded to include determinants of the constructs, in particular of PU and PEU. The version shown in Figure 1 is known as TAM2 (Venkatesh and Davis 2000). Among the additional elements, those of relevance to this paper are:

- Subjective Norm (SN): a person's perception that most people who are important to the person think he/she should or should not perform the behaviour in question;
- Image: the degree to which use of an innovation is perceived to enhance one's status in one's social system;
- Voluntariness: the extent to which potential adopters perceive the adoption decision to be non-mandatory;
- Result Demonstrability (RD): the tangibility of the results of using the innovation.

An account of the development of TAM up to 2007, providing many references, was given by Chuttur (2009). He also listed items that have been used to form scales for operationalising the different elements of the model. Examples include:

- PU: “Using [the system] would enhance my effectiveness on the job”;
- PEU: “My interaction with [the system] would be clear and understandable”;
- BI: “Assuming [the system] would be available on my job, I predict that I will use it on a regular basis in the future.”

Additionally, Chuttur offered a critique, balancing the model's own perceived ease of use against theoretical limitations. He made comparisons, not all favourable to TAM, with the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) - theories developed respectively before and around the same time as TAM and dealing with similar constructs (Chuttur 2009). It can be noted, however, that Venkatesh and Davies (2000) asserted the superiority of

TAM. They subsequently developed a unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al. 2003); however, it does not match TAM’s ease of use.

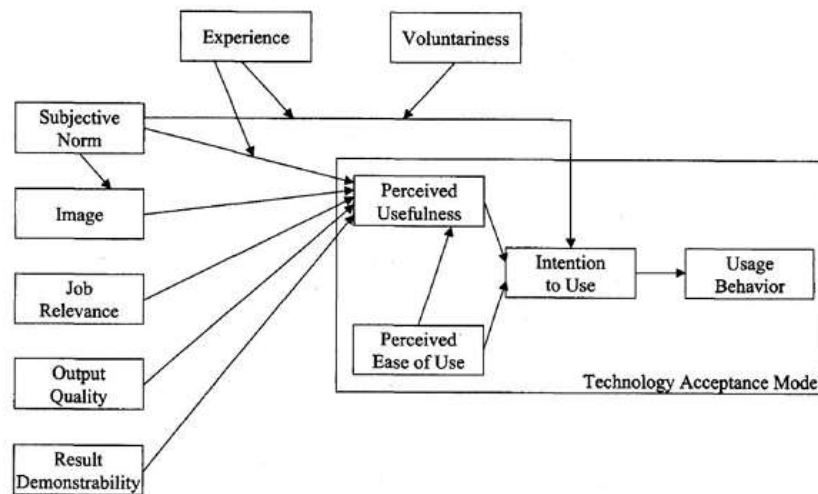


Figure 1. TAM2 – Extended Technology Acceptance Model (Venkatesh and Davis 2000, 188)

More recent work on TAM includes that of Liu, Li and Carlsson (2010), who added two further elements: Perceived “Long-term Usefulness” (LTU) and “Personal Innovativeness” (PI). The latter is relevant to this paper; it was identified as a predictor of PEU. The role of “self-efficacy” for TAM was investigated for example by Chen, Chen and Yen (2011), who tested TAM in their study on smart-phone acceptance and concluded that self-efficacy played a positive role in determining PEU but only partially affected PU.

Chuttur’s (2009) account refers to usage in many areas but does not focus on education. A large-scale study of educational interest is that carried out by Kreijns et al. (2014) with qualified teachers; its theoretical framework involves the Integrative Model of Planned Behaviour (a development in particular of TPB) rather than TAM, but the similarity of the constructs involved makes it relevant here. The study indicated that self-efficacy with regard to ICT, perhaps surprisingly, had very limited impact on intention to use it. For pre-service teachers, work includes that by Teo, Lee and Chai (2008) and Teo (2010). They found that PU, PEU and SN were significant determinants of pre-service attitudes to computer use, along with facilitating conditions (affecting PEU) and technological complexity. For pre-service teachers in Ireland, Egan et al. (2012) investigated whether self-reported competency (a proxy for self-efficacy) in using computers is related to the responses of the students to questionnaire items dealing with PU, PEU, PI and BI from an expanded TAM. The results were similar to the findings of Chen et al. (2011) mentioned above, in that self-reported competency correlated significantly with items addressing PEU rather than those referring to PU.

In summary, TAM provides a useful, usable and adaptable framework for investigating technology acceptance. These features can be deemed to outweigh any theoretical disadvantages, and they explain the continued popularity of the model.

### ***Context: programming in school curricula in Ireland***

The current situation as regards the teaching of programming, and more generally Computer Science, in both Northern Ireland and the Republic of Ireland is well captured by the following description of the international context:

“[Digital technology] in school curricula is often diluted because it has to cover three quite different directions: (1) using computers as a tool for teaching (e.g. “e-learning”), (2) using computers as a tool for general purpose applications (sometimes called ICT), and (3) computing as a discipline in its own right (including programming and CS [“Computer Science”]). Sometimes administrators and leaders confuse these roles, and this can make it difficult for Computer Science to be visible as a discipline in its own

right” (Bell, Andreae, and Lambert 2010, 17, emphasis added).

With regard to e-learning, the potential of digital technology for fundamentally changing the education system and generating or supporting innovative approaches to teaching and learning may have distracted attention from the role of Computer Science in appealing to at least some students. For ICT, Bell, Andreae, and Lambert (2010) raise an additional and relevant issue of concern. While ICT courses may contain some programming elements - say, for game development - overall they typically misrepresent the nature of Computer Science, leading students to opt for the latter at university or college for inappropriate reasons. However, in several countries (see for example Thompson and Bell [2013]), interest in Computer Science or programming in schools has recently grown, or has revived after a period in which the topics had become unfashionable. The latter is true of both Irish jurisdictions. The detailed situations in the two jurisdictions are different; relevant features are outlined in turn below, with links to further information provided.

Northern Ireland schools mainly offer ICT courses in the junior cycle of second-level education (<http://www.ccea.org.uk/>). These typically do involve some work with Scratch ([www.scratch.mit.edu](http://www.scratch.mit.edu)), a low-floor programming tool developed from LOGO (Crook 2009), and GameMaker ([www.yoyogames.com/studio](http://www.yoyogames.com/studio)), intended for game development. However, pressure for the introduction of Computer Science reflects the UK-wide drive for “computing” in schools (see <http://www.computingschool.org.uk/>). Pre-service teacher education for ICT courses currently includes some programming to address national qualifications in the area.

There has been less formal provision in the Republic. However, extracurricular activities are provided in some schools, and informal provision has burgeoned in recent years via CoderDojos ([www.coderdojo.com](http://www.coderdojo.com)). The Coderdojo movement - which started in Ireland - allows children to learn coding voluntarily, often via Scratch. As regards teacher education, short professional development courses on Scratch for teachers have been offered, notably by or in conjunction with the Computers in Education Society of Ireland (CESI), a voluntary body interested in all aspects of digital literacy. Since The Programming Studio project was initiated in 2013, an optional “short course” on Coding was approved for the junior cycle of the second-level curriculum, together with one on Digital Literacy ([www.ncca.ie](http://www.ncca.ie)); their introduction is now being supported by a major professional development initiative on the teaching of Computer Science topics, run at Trinity College Dublin ([www.scss.tcd.ie/disciplines/information\\_systems/crite/crite\\_web/](http://www.scss.tcd.ie/disciplines/information_systems/crite/crite_web/)).

Thompson and Bell (2013, 87) state: “Teachers play a pivotal role in the adoption of a new computer science curriculum, and therefore it is important to understand teachers’ needs and attitudes to new material.” In neither Irish jurisdiction was there a clear picture of the extent to which teachers were ready and willing to teach programming. It was against this background that The Programming Studio was started.

## **Research methodology**

### ***Population and sample***

Given that the focus on introducing programming or Computer Science courses in both jurisdictions is currently on second-level education, the focus of The Programming Studio is chiefly on teachers in second-level schools. However, using a nationally representative sample of teachers in such schools would have been inappropriate; most questions would be meaningful only to people with some interest or competency in the area. Consequently, purposive samples aimed at targeting prospective teachers of programming were identified. In Northern Ireland, the obvious candidates were teachers of the subject ICT. In the Republic, because of the lack of an established course in the curriculum, a different approach had to be taken. Sources for locating suitable teachers were the CESI membership list and lists of participants in appropriate professional development courses.

### ***Instrument***

A questionnaire was designed to explore relevant knowledge and dispositions key to

willingness to teach programming. As well as seeking background information (gender, age, number of years in teaching, and so forth), it addressed teachers’ qualifications and their knowledge of and attitudes to programming. Sections of greatest relevance to this paper, together with the constructs they are intended to measure, are as follows.

#### *Knowledge and use of programming languages*

The items in this section address self-reported competency and so provide proxies for self-efficacy. Programming languages and tools likely to be known by or available to respondents were listed (see Table 3 in the Findings section below). For each language a set of items was provided, asking if the respondent had heard of the language, had used it within the last three years, had dabbled in using it, could teach it to students and could teach it to teachers. Respondents were asked to select all responses that applied.

#### *View of the place of programming in schools*

This section aimed to tap respondents’ disposition towards the inclusion of programming in the school curriculum. For four stages in the education system (primary, and for second level: a minor element in the junior cycle, a main element in the junior cycle, and senior cycle), respondents were asked to state their level of agreement on a five-point scale - “strongly disagree” to “strongly agree” - with the statement that “It is essential that programming is included in the curriculum.”

#### *Attitudes to programming*

This section was based on TAM. Twenty eight Likert-type items (each with five responses, “strongly disagree” to “strongly agree”) were taken or adapted from versions of TAM scales and from items used by Egan et al. (2012), cited above, adapted to address programming. The intention was to create scales that might measure BI (Behavioural Intention to teach programming), PU (Perceived Usefulness to a teacher), PEU (Perceived Ease of Use), IMAGE (Image of a teacher of programming), SN (Subjective Norm), RD (Result Demonstrability), VOLUNT (Voluntariness) and PI (Personal Innovativeness). The first three of these are the core TAM variables. The inclusion of SN and IMAGE, in particular, was intended to investigate whether teachers felt some pressure from highly-regarded peers to be ready to teach programming and whether the teaching of programming was considered a high status activity. Such variables might contribute to indicating respondents’ professional identity as teachers of programming. RD might provide a link with respondents’ views of programming as essential, while VOLUNT could help in gauging respondents’ willingness to teach programming. The inclusion of PI reflects its use in other work by the second two authors (for example Egan et al. [2012]).

#### ***Piloting and administration***

The instrument was piloted with Master’s students studying technology and learning in Trinity College Dublin, and minor amendments were made in the light of feedback. The final version was localised where necessary to reflect differences in the Northern Ireland and Republic of Ireland education systems and contexts. For example, the two categories used with regard to programming in the junior cycle at second level are not identical; in Northern Ireland they represent the lower and upper part of the cycle, whereas in the Republic they represent short courses and full courses for national certification at the end of the cycle. The designations “minor” and “main” in this paper aim to reflect importance within the system in each case. However, the section on knowledge of programming and the TAM section were identical in both versions of the questionnaire.

The questionnaire was put online using the free survey tool SurveyGizmo. Approaches were made to prospective teachers of programming via heads of ICT departments in schools and personal contacts (Northern Ireland) and the CESI list and organisers of some courses for teachers

(Republic). The survey was open for six weeks in Spring 2014.

### ***Data processing***

The data were downloaded and entered into SPSS, with responses “strongly disagree” to “strongly agree” being coded from 1 to 5. Cleaning took place as follows:

- very incomplete records that would have contributed nothing to the analysis were eliminated. Altogether, 161 records were retained; details of this achieved sample are given in the Findings section (Table 2);
- for knowledge of programming languages, some respondents appear to have selected one response per language rather than “all that apply.” If a respondent selected *any* response for a given language, then “Heard of it” was deemed to be included, and the corresponding response amended if necessary. Responses to other items were judged to be independent. For example, it is possible that one person might feel more able to teach students than to teach teachers, whereas the opposite might be the case for another person; also, someone who had not used a language within the last three years might nonetheless feel competent to teach it.

Descriptive statistics were computed, and correlations obtained between variables of interest, in particular the TAM items.

As the TAM section of the questionnaire was designed specifically for the present study, investigation was needed to see if it measured the intended constructs described above. Analysis for TAM was based on 137 of the 161 cases, reflecting some pattern of non-response at the end of the questionnaire. The computation of correlation coefficients immediately pointed to deviations from the intended structure. Exploratory factor analyses were undertaken, several models being used in an attempt to maximise “accounting for variance” together with obtaining factors that “were reliable and could be interpreted”. Both Varimax and Oblimin rotations were considered, and scree plots were examined to aid identification of the number of factors to be retained (DeCoster 1998; Osborne 2014). The version deemed most successful is described and discussed in the Findings section below.

For each of the factors, item scores were added and the total divided by the number of items to produce a scale score for each respondent. Possible scores range from 1 (“strongly disagree” with all component items) to 5 (“strongly agree” with all). Scale scores were computed also for a variable designed as CURRICULUM, formed by finding the mean of the four “programming in schools” scores for each respondent. Again, the range is from 1 to 5. For these scale scores, means and standard deviations were calculated for each sample. Comparisons (between jurisdictions and between genders) were made for relevant variables, using t-tests.

## **Findings**

### ***Construction of TAM scales***

The structure for TAM, chosen in accordance with the criteria described above, resulted from a Principal Components Analysis retaining eigenvalues greater than 1 and using the Varimax rotation. This gave five factors with reliability (Cronbach alpha) greater than 0.7, and accounted for 58% of the variance. From inspection of the items retained - those with loading greater than or equal to 0.5, together with two that had loadings greater than 0.4 and retention of which improved reliability - the five factors were tentatively described as follows:

- PUT: Perceived Usefulness for Teaching;
- PEU: Perceived Ease of Use;
- PIBI: Personal Innovative Behaviour and Intentions;
- IMAGE: Image;
- SNS: Subjective Norm in School.

Details of the factors, together with indicative items for each one, are shown in Table 1.

Table 1. Factor details (number of items, reliability) with selected items

Scale	No. of items	Specimen item(s)	Alpha
PUT	7	Being able to teach a programming language enhances my effectiveness as a teacher I would be keen to introduce programming in my school	0.889
PEU	4	Teaching programming is easy Programming is easy	0.838
PIBI	6	If I heard about a new technology, I would look for ways to experiment with it in my teaching	0.785
IMAGE	3	People in my school who can teach programming will have a high profile	0.817
SNS	2	Senior staff who influence my behaviour think that I should be able to teach programming	0.726

The factors do not correspond exactly to those in standard versions of TAM. For example, rather than two factors corresponding to PI and BI being identifiable, a composite version tentatively labelled PIBI emerged. Moreover, the item “I would be keen to introduce programming in my school” loaded on the first factor, described as PUT, rather than on PIBI; this may indicate that PUT reflects a focus on possible career advancement as well as effectiveness in teaching. Reliable scales corresponding to RD and VOLUNT were not found. There are implications for measuring constructs as intended. (Using exploratory factor analysis for the two samples separately yielded two different structures, that for the Republic of Ireland being closer to the usual versions. However, numbers in each sample are small for supporting factor analysis; in any case, constructing different scales would have obviated meaningful comparisons).

The relationships - highly significant Pearson correlation coefficients - between the scales are shown in Figure 2 in graphical form. Nodes are placed in positions suggested by the standard TAM model, but the data do not provide evidence of the direction of any causal relationships. Unlike the case for comparable scales in the standard model, there is no significant correlation between PUT and PEU.

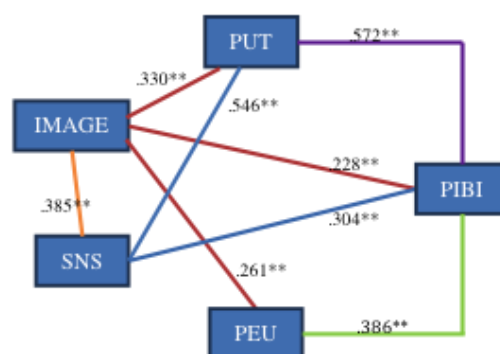


Figure 2. Relationship between constructed TAM scales, showing Pearson correlation coefficients

Note: \*\*Correlation is significant at the 0.01 level

### ***Findings for respondents in Northern Ireland and in the Republic of Ireland***

Findings for the respondents from the two jurisdictions are reported in this section. While comparisons are made, the different nature of the samples means that these should be interpreted as highlighting two different “story lines,” rather than in terms of one group being regarded as superior or inferior to the other.

*Achieved sample by gender*

In total, 219 responses to the questionnaire were received. Of these, 90 were from Northern Ireland (from around 200 to 250 teachers of ICT in the schools approached) and 129 from the Republic of Ireland (for which the target population cannot be estimated; the number of people on the CESI mailing list and course lists who are “potential teachers of programming” is not known). After elimination of very incomplete cases as described above, 161 cases were retained. The distribution, by jurisdiction and gender, is shown in Table 2. The imbalance as regards gender is notable. The matter is not pursued in detail here, though gender differences (or lack of them) are noted where relevant.

Table 2. Achieved samples for Northern Ireland and the Republic of Ireland, by gender

	Female	Male	Total
Northern Ireland	41 (66%)	21 (34%)	62
Republic of Ireland	20 (20%)	79 (80%)	99

*Knowledge and use of programming languages/tools*

Responses to the items on self-reported competency with regard to languages and tools are shown in Table 3.

Table 3. Respondents’ awareness of and competency with regard to programming languages / tools, by jurisdiction

Application	Heard of it (%)	Used within three years (%)	Dabbler (%)	Could teach students (%)	Could teach teachers (%)	Total
Northern Ireland						
Scratch	95.2	25.8	19.4	35.5	32.3	62
Gamemaker	93.5	14.5	8.1	48.4	32.3	62
JavaScript	95.2	12.9	16.1	21.0	3.2	62
Java	91.9	9.7	11.3	12.9	6.5	62
HTML	95.2	21.0	22.6	40.3	19.4	62
Python	75.8	3.2	8.1	4.8	1.6	62
Raspberry Pi	88.7	4.8	12.9	8.1	3.2	62
C Sharp	77.4	8.1	8.1	16.1	6.5	62
App Inventor	75.8	11.3	8.1	6.5	1.6	62
Pascal	87.1	3.2	1.6	9.7	6.5	62
Cobol	79.0	3.2	4.8	4.8	3.2	62
Visual Basic	91.9	8.1	9.7	16.1	16.1	62
GreenFoot	61.3	6.5	1.6	3.2	0.0	62
Republic of Ireland						
Scratch	74.7	13.1	13.1	19.2	7.1	99
Gamemaker	35.4	4.0	1.0	1.0	0.0	99
JavaScript	77.8	9.1	5.1	1.0	1.0	99
Java	85.9	8.1	5.1	2.0	0.0	99
HTML	84.8	13.1	14.1	9.1	4.0	99
Python	37.4	3.0	6.1	1.0	1.0	99
Raspberry Pi	44.4	2.0	9.1	3.0	1.0	99
C Sharp	38.4	4.0	2.0	0.0	0.0	99
App Inventor	42.4	3.0	4.0	1.0	0.0	99
Pascal	39.4	2.0	1.0	3.0	0.0	99
Cobol	43.4	1.0	0.0	1.0	0.0	99
Visual Basic	51.5	1.0	7.1	3.0	0.0	99
GreenFoot	26.3	2.0	1.0	1.0	0.0	99

As pointed out above, entries in columns other than “Heard of it” may provide underestimates, as many respondents appear to have selected one response rather than “all that apply”; thus, detailed analysis is inappropriate. Nonetheless, it can be seen that overall the respondents’ reported levels of competency with regard to teaching even the most familiar languages are low. For some likely elements - such as Python and the Raspberry Pi - in a Computer Science/programming course, those levels are minimal. The Northern cohort reported considerably

more awareness and competency than the cohort from the Republic. In particular, except for Scratch, JavaScript, Java and HTML, the percentages in the former who reported having “heard of” the languages are of the order of twice as large as those for the latter.

### *Place of programming in schools*

Respondents’ levels of agreement with the statements that the inclusion of programming in school curricula is “essential” at different stages of the school system are shown in Figure 3. All mean scores are above 3, representing views that on average are at least neutral and in general somewhat positive towards programming being deemed essential. The CURRICULUM scale, with reliability (Cronbach alpha) 0.876, provides a useful summary. Except for the “minor” course in the junior cycle - the level at which the Coding short course has just been introduced in the Republic - the Northern mean scores are higher: highly significantly so ( $p < 0.01$ ), other than for primary level.

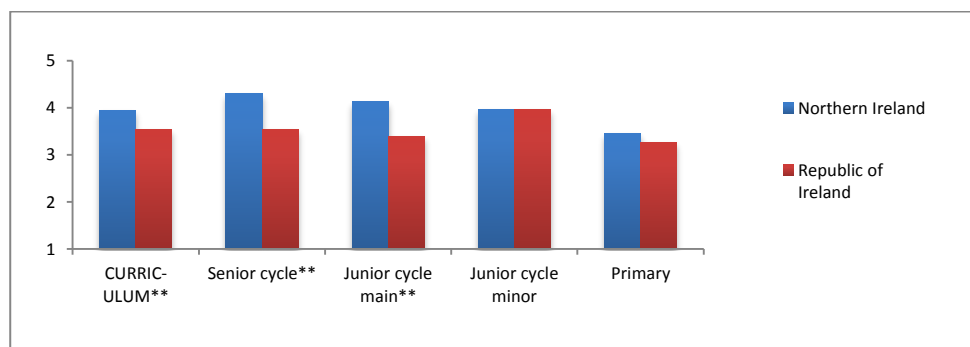


Figure 3. Extent of agreement with programming being essential in school curricula at different levels of the education system: mean scores by jurisdiction

Note: \*\* Northern Ireland scores significantly higher ( $p < 0.01$ ).

For each sample, Pearson correlations between the variables are highly significant ( $p < 0.01$ ) and moderate to strong (in the range 0.5 to over 0.9), as reflected in the reliability of the CURRICULUM scale. Patterns are similar in the two jurisdictions. Possible gender differences were examined for all five variables; no significant differences were found for either sample or for the entire group.

### *Attitudes to programming using the TAM scales*

Attitudes to programming as reflected in mean TAM scale scores are shown in Figure 4. For PUT and PIBI, means are on the positive side of neutral, perhaps indicating recognition among participants of a role for teachers of programming and also some willingness to undertake that role. For PEU and IMAGE, however, means are on the negative side, suggesting that programming and teaching it are challenging but that the respondents do not see the role as ascribing high status in their school systems. The results for SNS point to the Northern teachers as being under more pressure to undertake the role.

In neither group were there significant differences by gender. However, for the total sample, significantly higher scores occurred for females than for males on PUT ( $p < 0.05$ ) and SNS ( $p < 0.01$ ).

Correlation patterns for the TAM scale scores with the CURRICULUM scale were different for the two samples. Most correlations were moderate and highly significant ( $p < 0.01$ ). However, for the Northern cohort, correlation between CURRICULUM and IMAGE was not significant, and that between CURRICULUM and SNS was significant only at the 0.05 level. For the Republic cohort, the lowest correlation was with PEU ( $p < 0.05$ ); the others were highly significant.



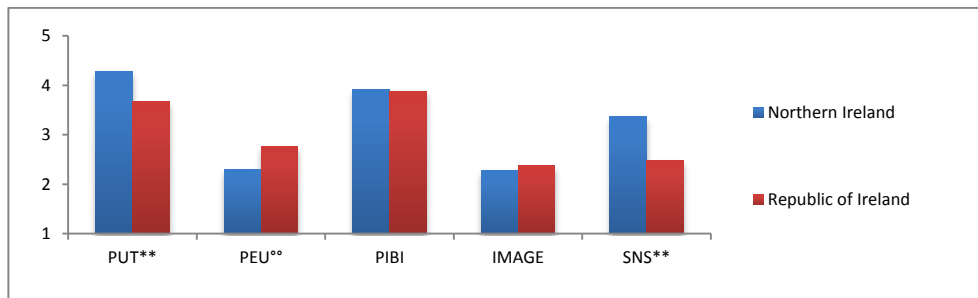


Figure 4. Mean scores on constructed TAM scales, by jurisdiction  
 Note:\*\* Northern Ireland scores significantly higher ( $p < 0.01$ )  
 °° Republic of Ireland scores significantly higher ( $p < 0.01$ )

### Discussion

Responses to the questionnaire indicate that the teachers in the purposive samples - likely to be well disposed towards digital technology - are, on average, slightly positive towards programming being an “essential” element of the curriculum, giving a rather undifferentiated endorsement to its inclusion at all curricular levels. The word “essential” was chosen to provoke strong reactions; it would have been interesting to triangulate using a less forceful set of statements, but the length of the questionnaire was an issue without introducing more items. The TAM scale scores indicate that respondents overall are moderately willing, or perhaps not unwilling, to teach programming. However, as a group they currently lack the competency that would be required to help students learn to a standard required for high-level national certification. Potential for growth may be found among those who describe themselves as “dabblers” in programming languages. However, this, together with further investigation of respondents’ profiles, is outside the scope of the present paper.

The differing responses from the two jurisdictions reflect the differences in the purposive samples. For example, Northern Ireland respondents - teachers of ICT - are generally familiar with Scratch and GameMaker as well as with languages associated with web use (HTML, JavaScript, Java), though not necessarily ready to teach these in school. Those from the Republic report some familiarity with Scratch, currently the focus of attention via CoderDojo and informal professional development courses, and now addressed also through the professional development initiative to support the new Coding short course; apart from that and awareness of the web-related languages, reported familiarity is very low. The findings for gender, and the differing correlation patterns in the two jurisdictions, are not easy to interpret, and further investigation is needed.

### Conclusions and implications for teacher education

This paper reports on the first phase of a project designed to investigate levels of competency in and readiness to teach programming for teachers in the two jurisdictions in the island of Ireland, and to facilitate small groups in enhancing their readiness through games-based learning. The context is the current interest in provision of programming or Computer Science courses in the school curriculum, a live issue - and currently a moving target, with ongoing developments - in both jurisdictions. The paper focuses on the design of an instrument to capture the relevant information, notably by developing a form of the Technology Acceptance Model (TAM) adapted for programming, and on initial findings from purposive samples of teachers with regard to their competence in programming, their view of the role of programming in school, and their attitude to teaching the subject.

While the sampled teachers in general are moderately willing to engage with programming, the findings point to a need for extended teacher education (pre-service and in-service) in the area and to the necessity of developing or re-developing teachers’ professional identities as teachers of programming. Surveys carried out in New Zealand over the period of introduction of Computer Science to the curriculum show an increase in teachers’ confidence after they undertook

professional development and gained experience of teaching that subject (Thompson and Bell 2013). It is hoped that the same pattern will occur in both Northern Ireland and the Republic of Ireland, and that the second phase of The Programming Studio project - in which teachers engage in mastering programming languages through games-based learning - will contribute to gains in both competency and confidence in teaching programming as its role in school curricula develops.

## Acknowledgement

This work was supported by SCoTENS (the Standing Conference on Teacher Education, North and South).

## References

- Bell, T., P. Andreae, and L. Lambert. 2010. “Computer science in New Zealand high schools.” *Proceedings of the 12<sup>th</sup> Australasian Computing Education Conference (ACE 2010), Brisbane, Australia*, 15–22.
- Chen, K., J. Chen, and D. Yen. 2011. “Dimensions of self-efficacy in the study of smart phone acceptance.” *Computer Standards & Interfaces* 33 (4): 422–431.
- Chuttur M. 2009. “Overview of the technology acceptance model: origins, developments and future directions.” Indiana University, USA .Sprouts: Working Papers on Information Systems, 9 (37). <http://sprouts.aisnet.org/9-37>
- Crook, S. 2009. “Embedding scratch in the classroom.” *International Journal of Learning and Media* 1 (4): 17–21.
- Davis, F. 1989. “Perceived usefulness, perceived ease of use, and user acceptance of information technology.” *MIS Quarterly* 13 (3): 319–340.
- DeCoster, J. 1998. *Overview of factor analysis*. <http://www.stat-help.com>
- Egan, A., A. FitzGibbon, C. Girvan, and E. Oldham. 2012. “Self-reported competency and technology acceptance: investigating the relationship for a cohort of Irish pre-service teachers.” In *Society for Information Technology & Teacher Education International Conference 2012*, edited by P. Resta, 3210–3217. NP: Association for the Advancement of Computing in Education.
- Kreijns, K., M. Vermeulen, F. Van Acker, and H. van Buuren. 2014. “Predicting teachers’ use of digital learning materials: combining self-determination theory and the integrative model of behaviour prediction.” *European Journal of Teacher Education* 37 (4): 465–478.
- Liu, Y., H. Li, and C. Carlsson. 2010. “Factors driving the adoption of m-learning: an empirical study.” *Computers & Education* 55 (3), 1211–1219.
- Osborne, J. 2014. *Best Practices in Exploratory Factor Analysis*. NP: CreateSpace Independent Publishing Platform.
- Teo, T., C. Lee and C. Chai. 2008. “Understanding pre-service teachers’ computer attitudes: applying and extending the technology acceptance model.” *Journal of Computer Assisted Learning* 24 (2), 128–143.
- Teo, T. (2010). “A path analysis of pre-service teachers’ attitudes to computer use: applying and extending the technology acceptance model in an educational context.” *Interactive Learning Environments* 18 (1): 128–143.
- Thompson, D., and T. Bell. 2013. “Adoption of new computer science high school standards by New Zealand teachers.” In *WiPSCE (8th Workshop in Primary and Secondary Computing Education) 13, November 11–13, 2013, Aarhus, Denmark*, 87–90.
- Venkatesh, V., and F. Davis. 2000. “A theoretical extension of the technology acceptance model: four longitudinal field studies.” *Management Science* 46 (2): 186–204.
- Venkatesh, V., M. Morris, G. Davis, and F. Davis. 2003. “User acceptance of information technology: toward a unified view.” *MIS Quarterly* 27 (3): 25–478.

[Back to contents](#)



## **A desire to learn! Motivation for learning about science and technology among Norwegian pupils in upper secondary school**

*Heidi Regine Bergsager*

*Østfold University College, Norway*

heidi.r.bergsager@hiof.no

### **Abstract**

There is currently a shortage of young people in Norway choosing courses of study in higher education that centre on science and technology. There is a great need for finding out more about how to involve, motivate and engage pupils in science and technology subjects. In order to address this situation the Norwegian Ministry of Education and Research has formulated a strategy for strengthening education in science and technology for the years 2010-2014. This strategy has affected the discussion of these subjects within teacher education such as: How may *we* work to ensure that teacher education programmes prepare future teachers to promote pupils interest in science and technology? The paper aims to discuss the research question: “What motivates the desire to learn about science and technology among pupils in Norwegian upper secondary school?”.

**Keywords:** science education; learning activities; learning contexts; classmates and relationships; teacher skill.

### **Context of the research**

This paper provides insights from three years of field work, 2011-2014, during which researchers followed the same class in upper secondary school, age 16 to 19, in Norway. We wanted to bring forward the pupils’ opinions of what gave them a desire to learn more in science and technology. The research question is addressed empirically. We used interviews as the main method in our research. Theoretically, we use pragmatic reasoning about knowledge and how knowledge arises in action.

In Norway, over many years, there has been a shortage of people who choose science and technology as a field of their work. The Norwegian Ministry of Education and Research has formulated a strategy for strengthening skills, recruitment and implementation at all levels in these subjects for the years 2010-2014, within the Norwegian school (Strategy 2010). One of the challenges is to rethink the teaching of these subjects so that interest can be strengthened and pupils and students will choose programmes in higher education and professions that centre on science and technology.

In autumn 2011, 30 pupils started on a new education programme, Science. Unique for this particular programme was the emphasis placed on the combination of science, technology and entrepreneurship. A curriculum was developed and teachers were selected for these priority areas ([www.greaker.vgs.no](http://www.greaker.vgs.no)). In developing this curriculum, the school followed the initiatives from the Norwegian Ministry of Education and Research on science. The pupils were selected by application and needed high average grades in order to be accepted.

One of the larger implications of this study for teacher education and European educational research is that these findings may carry possibilities for new and interesting discussions of how we motivate for learning in the sciences. The young people who participated this research project challenge teachers, and especially those of us who educate teachers, to change some frameworks radically. It may be time to rethink how teacher education prepares future teachers to motivate learning in science and technology. The pupils say that they need teachers that have good knowledge of the subject, good knowledge of diverse approaches and good knowledge of how to use varied learning contexts. This article presents the proposals these pupils specifically mention.

## Research question

My task in the research project was to investigate what stimulates pupils to pursue higher education in science and technology. Over three years, a group of pupils were interviewed about their views on learning and their motivation to learn. The questions we asked emerged from our main research question: “What motivates the desire to learn about science and technology among pupils in Norwegian upper secondary school?”.

## Theoretical framework

Theoretically, this project draws on pragmatism. Pragmatism emphasizes individual active participation in the learning process, and posits that the experiences we get from our actions open up for new learning. The basic philosophy is based on the idea that we all carry a positive identity where we can take responsibility and grow through dedication, rationality and autonomy. Furthermore, teachers who act as anchors with knowledge and guidance for pupils are highly important as the pupils develop (Gustavsson 2009; Dewey 1916). The reason for choosing this philosophical foundation is based on information coming from the teachers and mainly from the interviews with the pupils themselves. Throughout the three years the project lasted, the pupils consistently pointed to the importance of school work that required activity and participation and having a close connection with their teachers.

Before carrying out our research, we did question if there was any point in following a class of academically strong pupils. Do we not often say that these pupils are doing their best anyway? But we find that little research has been done on academically strong pupils and few people have asked what will trigger them to learn even more about a subject. So we were curious about this group’s motivation for learning. We were also concerned if results from a group of academically strong pupils could have transfer value to other groups in secondary high school. What is good motivational learning and how can we as educators provide the professional expertise of our students as future teachers?

Teaching that emphasizes theory, action and reflection in the learning process, allows us to listen to pupils’ experiences of their own learning. This knowledge gives us opportunities to take the best care of each pupil. The information provides a basis for reflection and discussion on what should be taught individually or in small groups and to bring out what can be taught to the whole class. There must be a correlation between students’ learning conditions and individual preferences (Imsen 2005; Skaalvik and Skaalvik 2013).

## Research methodology

The goal of this project was to investigate what promotes learning, the joy of learning and what can contribute to coping and increased motivation to study further in higher education in the sciences. Our project used a qualitative approach to explore these questions. Qualitative research involves and explores the human processes that take place in actual practices. In qualitative research it is essential that the researcher is open to what the participants say and thus highlights their perspectives (Creswell 1998; Denzin and Lincoln 1994, 2000; Postholm 2011). This article tries to do just that and show the perspectives that have emerged from the interviews conducted over three years. The first year we participated with the pupils in the classroom, laboratories, when they visited a science centre and several businesses. We wanted to get to know the pupils and for them to get to know us. Participant observation was a strategy to open up for a familiarity that gave us a relaxed atmosphere during the interviews. Over the three years the project lasted, we interviewed the same five girls and five boys.

In the analysis, we have through more extensive processes examined the data we have received to get closer to the core of what is the basic information in the interviews. We have used grounded theory as a basis for our analysis. The goal was to capture the complexities inherent in our pupils’ desire to learn (Strauss and Corbin 1998). Through our analysis and discussions we identified four categories that seemed particularly important for the pupils’ motivation.

Furthermore, these categories may function as a basis for a philosophical academic standpoint on how we work to ensure that teacher education programmes prepare future teachers to promote pupils interest in science and technology.

The research question was consistent over all three years, while some of the questions we asked the pupils varied based on the answers the pupils gave. This shows us their development over time. We found it important to follow the pupils` processes and respond directly to their information. The analysis does not take into account the multi-cultural background or gender of the pupils, although our material shows that during these three years there is a marked distinction between boys and girls in the class. The pupils are treated as a homogeneous group, which groups seldom are. To delve into the differences is not a subject in this article, but we realize that it is an important area for discussion within teacher education because such differences might affect our students` openness to the professional focus and organization of teaching. Thus, this is most certainly an area for future research.

The information from the first two rounds of interviews corresponded and therefore it is presented as joint analysis material. There is an overwhelming positivity about subject matter, teaching, projects, collaboration in class trips and especially the teachers. Because feedback is so similar, four clear categories emerged and we present examples from each category below. We also used the categories for the interviews in the third grade in upper-secondary school as the basis for the questions we posed (Strauss and Corbin 1998).

## **Findings**

So what did the pupils say? The pupils are strong in their opinions about the combination of gaining practical experience combined with theory, which provides opportunities to develop good learning. The feedback can be categorized under four keywords: learning activities, learning contexts, classmates and relationships, and teachers` skills.

### ***Learning activities***

In their comments during their first year of science education, the pupils focused on the high level of activity. They said that activities and the use of different ways of working/learning activities meant that they learned faster than just having lectures and working with tasks, which is a common form of instruction in upper-secondary schools in Norway today. Furthermore they pointed out that a brief review of theory before practical activities is important in the learning process. This is consistent with what they said in the third grade in upper-secondary school. After three years they were still excited about high levels of activity and plenty of practical challenges. They pointed out that as a result of being required to express their own knowledge and spending time on reflection, these activities were essential for learning and a good motivation to learn more:

“Teachers do best at varied working methods so it is not so monotonous. Methods like reading and working in groups or having blackboard teaching, are good. I learn a lot from making presentations. Individual work is best in the long run, and I do not want to be in groups where classmates cannot work together.” (Boy).

When the pupils looked back on three years of learning they emphasized the combination of theory and activities with reflection and understanding of the subject matter. They said there must be a purpose for what they do and it must be linked to the curriculum.

The first year the pupils participated in a project which involved building a boat for a competition with students at NTNU (Norwegian University of Science). Beyond the process of learning how to build a boat, this meant that pupils and teachers travelled and lived together for several days. Positive feedback on the social aspect was overwhelming, and the pupils said that the lectures at the university and conversations with university students were important for their development. Several of the pupils consulted the NTNU campus about opportunities for higher education when they finished upper secondary school. This attraction is probably not lessened by the fact that NTNU, after they visited the university, has facilitated research and got a Nobel Prize in medicine in 2014.

“In the project with boats... somehow we used the theory and made it into practice. (Laughter ...) The boats worked partially. It was fun to try because nobody thought we could manage to make a boat, at least not the girls. A little chaos, ended well.” (Boy).

The educational consequences of taking the pupils’ feedback seriously can be that teaching and learning must give much more space to what we call investigative working-methods. It means experimenting, making excursions into nature, visiting companies and organisations, universities and other parts of the community to answer questions and motivate pupils. Knowledge should not only establish facts and truths, but be acquired through the living processes where knowledge building drives pupils forward in their learning. Dewey himself acknowledged the fact that some of the most important learning processes arises when knowledge is created and being examined (Krumsvik and Säljö 2013). The fulfillment of increasing expertise gives energy to master new challenges (Deci and Ryan 2000; Reeve 2005). The need for expertise contributes to strong development of motivation.

### *Learning contexts*

“It is the field trips that rank highest for me and that we have quite a large choice of subjects ... Right now I think the field trips are the best because of the social relationships and for my part that is important for me to learn something. I think it is really fun to take the lessons and learn in real life. This provides a very different connection with the field and it seems much more genuine and real and it is also much more interesting.” (Girl).

After three years, the pupils were fairly clear in their expressions that travelling to campuses, and visiting organizations and businesses to learn more about theory in practice, gave a very high level of motivation and learning. The pupils emphasized that the field trips provide variation and that the knowledge they gain in the field of practice makes learning becomes real for them. But they also say that activities outside school must have a clear purpose.

The class could use a new science centre once a week and the pupils gave mixed feedback on this opportunity. They did not see the benefit of using the centre if it was being used as a classroom, which they claimed was what usually happened. But several of them wanted to be at the centre and have activities connected to their learning process. The pupils remarked that the teachers needed to come up with a strategy for how they could use the centre meaningfully because most of the activities at the centre were geared toward younger pupils.

“Boring to be at the science centre, really. We did not use any special activity and most of the things I had already experienced so it was nothing new...” (Boy).

“I really miss being there because you get a break from school and it feels less like subjects than when we are at school.” (Girl).

“With entrepreneurship, it is important to be creative and things like that and for my part, when I need to be creative and stuff, then I do something else. That way the science centre works fine for me. There is so much you can go and fiddle with and look at.” (Boy).

The pupils highlighted methods that include commitment and reflection. It is not the content itself that is important in their responses, but how they work with the subjects. They want to use science in practical work, get out of the classroom and use a variation of learning contexts, meet professionals and be together with teachers who are good at the subject and who are good at guiding them. The pupils suggest that much of the motivation to work hard comes from variations in activities where they need to be active themselves and form participating in a variety of learning contexts.

If learning is understood as an individual process occurring through time, different learning contexts will be of high importance for an inner driving force of motivation to learn (Frøyland 2010). According to Gardner (1993) good teachers must strive to use as many methods and learning contexts as possible to motivate and reach all pupils in their teaching because there are multiple ways to be motivated.

### *Classmates and relationships*

The first year the pupils claimed they were at the same level and had the same learning needs. They did not have to wait for others in the class, pass time by doing additional tasks or help other pupils with their tasks. They told me they were upset and confused in primary and secondary school because learning processes did not lead to any academic progress for them. They also needed to hold back their progress in subjects to prevent being bullied by other pupils. Excelling academically, they said, was no advantage in contrast to what they experienced in this class. “I just have to say it. It is absolutely amazing and I can be myself!” (Girl from first year).

All informants said that the first year in the science programme was good. They were excited and said it got even better when they went on field trips, had common experiences and had the same focus on subjects. But gradually the discussions reflected what seemed to be a change in the social interaction between pupils. Some of them mentioned heated discussions in the class, but at that time they thought it would not last. At the end of first year they were vague as to what had happened. “There is a slightly disrupted atmosphere between the boys and the girls. At first we were pretty well mixed, but then we split up so the teachers almost had to force us to sit together.” (Girl). “The boys are much less stressed than the girls. The girls are working too much unnecessarily.” (Boy).

It appears from the interviews that the girls put great emphasis on getting good grades. They wanted very much “to be good and also the best”. The boys, however, said they were surprised at how much more calm and relaxed they were, although there was plenty to do. All of them were ambitious and felt a pressure to achieve good grades and at times felt the amount of work they put in was high. In the third year they said it had been three tough years even though they have experienced that hard work produces good results. They were also clear about what they experienced as a difficult development of the class with respect to the class environment.

“There has been a lot of bad atmosphere in the class. There is a large group of friends that I always hang out with, but the class is divided. We are not united as we were. Yes, I cannot remember the last time I spoke to one of the boys.” (Girl).

Despite a good start during which classmates and teachers wanted to maintain a good environment, the interviews reveal that some pupils feel that some of their classmates have dominated with a negative attitude. “So you can say that in my class there are only intelligent people and I believe that affects the environment a bit. Some pain as well because there are many strong personalities ...” (Boy). “Big egos that make ... have many opinions. But there have been some shit comments like that for some time, there has been some stuff there. No ... I do not care so much about them anymore.” (Boy).

If pupils are very self-centred and strive to be the best, they might experience working with competitive classmates as rather stressful. When these pupils do not achieve the desired results, they can react with anger and frustration. Frustration can be directed toward other pupils, since the interaction with them becomes costly and affects the environment and leads to the development of a negative atmosphere (Skaalvik and Skaalvik 2013). The teacher’s ability to pick up on the classroom environment and on the conditions between pupils proves here to be essential. They must have knowledge of how positive and negative environments can be created within and between groups of pupils. The development of the atmosphere in this class opens up new questions on how this may have affected pupils’ motivation and desire to learn. These questions are not addressed in this study, but are considered to be very important as a topic to be explored in future research. Broadly they are linked with the experiences of conflict resolution pupils bring with them and how they will handle similar situations in higher education and working life in general (Hargreaves 1994).

### *Teacher’s skills*

The last category, teacher’s skill, came forward when I asked the pupils if there was something they had experienced as particularly important for their learning process and desire for learning. They all gave an unanimous answer. Their teachers’ receive much praise because they are



highly skilled and give the pupils useful and positive feedback. This inspires the pupils to continue to focus and learn more. They emphasized that teachers are important and that they see each one of them, helping the individual to learn. This creates more interest in the subject. They were also concerned that the teacher must have a good sense of humour and must have earned the respect of the class. All the pupils were pleased that their teachers talked with them about assessment, and gave them chances to improve their grades. “You need to know if you, by making an effort, can get a better grade and even learn something about what it takes!” (Boy).

Traditionally in Norway, it is often the teacher who is at the centre when teaching takes place. Our pupils are clear that the focus should not be on the teacher, but on different activities that allow the pupils to work with the subjects in various ways. When they were involved in activities, they said, it made them stay focused. Teachers are often very fond of being at the centre even when they earlier, as students themselves, were clear; full days of lectures are boring.

The pupils in our material stated that teachers are adept at letting them develop different kind of skills by letting them have the freedom to be active in large parts of the learning processes. In all three years the teachers have been good at facilitating good projects, involving professionals, arranging trips outside the school and helping each student in their desire to learn. “The teachers are always happy and engaged and know a lot about their subject. Mood has really a lot to say! (Laughter) But they must be good and help others to get involved.” (Girl).

### **Conclusions and implications for teacher education**

Through the years, a wealth of different measures with the aim of increasing recruitment to science and technology in higher education, have been implemented. It is important to have an awareness of the limitations and possibilities inherent in these measures. Our research project is one of many contributions to the debate on how teachers and teachers’ educators might facilitate and encourage pupils and students learning and motivation. We believe that this study shows how important it is to focus on activities, problem solving, reflection and collaboration in different learning context to motivate pupils and students. The driving forces in these learning processes are teachers who facilitate learning for the individual pupil and student.

This paper does not open up a discussion about whether the information from the pupils or the four categories is relevant or not. The presentations of the pupils’ statements, and the theories that underpin their statements, are intended as a basis for further discussions according to our research question on what motivates pupils’ desire to learn about science and technology. We want to put the development of pupils motivation “on the map” to sensitize ourselves and our colleagues on what our teaching should contain for “our” students as future teachers. How can we, as teachers’ educators, be the best models? Even though it can seem too simplistic we hope that one of the goals in our educational system is focusing on how we, as educators, motivate “all” our pupils and students. So in the end the challenges of how interests can be strengthened lies not only among our students and their pupils, but rather what knowledge in theory and practice we ourselves have on desires to learn and how we develop those desires. “When the Wind of Change is blowing, some build shelters, while others will build windmills.” (HRB).

### **Acknowledgements**

A big Thank You to pupils, teachers and administrators at Greåker Upper Secondary School for giving us unique opportunities by interviewing them and let us participate in their work. They have all shown great openness, trust and widespread willingness to cooperate. This cooperation has made it possible to obtain teaching strategies that can promote learning in science and technology for all groups of pupils and students.

Thanks to Kristin Solli with her warm attitude and help in the final phase.

Great fun and many long reflections together with my two colleagues: BirgerTollefsen and not least Camilla B. Halstvedt. Without these two, no research. Thank you!

### **References**

Chen, J-Q., S. Moran, and H. Gardner. 2009. *Multiple intelligences around the world*. San

- Fransisco: Jossey-Bass.
- Creswell, J. 1998. *Qualitative inquiry and research design. Choosing among five traditions*. Thousand Oaks: Sage Publications-
- Dale, E.L. 1989. *Pedagogisk profesjonalitet. Om pedagogikkens identitet og anvendelse*. Oslo: Gyldendal.
- Deci, E., and R. Ryan. 2000. “The “what” and “why” of goal pursuits: human needs and the self-determination of behavior.” *Psychological Inquiry* 11: 227-268.
- Denzin, N., and Y. Lincoln, eds.1994/2000. *Handbook of qualitative research*. Thousand Oaks: Sage Publications, Inc.
- Dewey, J. 1916. *The collected works of John Dewey: middle works, vol. 9*. Aarhus: Klim 2005.
- Frøyland, M. 2010. *Mange erfaringer i mange rom. Variert undervisning i klasserom, museum og naturen*. Oslo: Abstrakt forlag.
- Gardner, H. 1993. *Frames of mind. The theory of multiple intelligences*. London: Fontana Press.
- Gustavsson, B. 2009. *Kunnskapsfilosofi. Tre kunnskapsformer i historisk belysning*. Smedjebacken: Wahlström & Widstrand
- Hargreaves, A. 1994. *Changing teachers, changing time*. London: Cassell, Villiers House.
- Hargreaves, A., and D. Shirley. 2012. *Den fjerde vei. En inspirasjon til endring i skolen*. Oslo: Gyldendal Akademisk.
- Imsen, G. 2005. *Elevens verden. Innføring i pedagogisk psykologi*. Oslo: Universitetsforlaget.
- Jensen, F., J. Sjaastad and E. Henriksen. 2011. “Hva nytter? På jakt etter suksesshistorier om rekruttering til realfag.” *Journal 1*. Oslo: University of Oslo, Norwegian Centre for Science Education.
- Krumsvik, R., and R. Säljøl, eds. 2013. *Praktisk-pedagogisk utdanning. En antologi*. Bergen: Fagbokforlaget.
- Norwegian Ministry for Education and Research. 2010. *Realfag for framtiden: Strategi for styrking av realfag og teknologi 2010-2014*. Oslo: Norwegian Ministry for Education and Research. [https://www.regjeringen.no/globalassets/upload/kd/vedlegg/uh/rapporter\\_og\\_planer/science\\_for\\_the\\_future.pdf](https://www.regjeringen.no/globalassets/upload/kd/vedlegg/uh/rapporter_og_planer/science_for_the_future.pdf)
- Nissen, P. 1978. *Involveringspedagogik. Vækst i skolen gjennom klassemøder med børn og voksne*. København: Gyldendal.
- Nordal, S. 2010. *Kunnskapsstatus. Bibliografi over norske vitensenterstudier 2003-2010*. Oslo: Norwegian Research Council.
- Postholm, M. 2011. *Kvalitativ metode. En innføring med fokus på fenomenologi, etnografi og kasusstudier*. Oslo: Universitetsforlaget.
- Prashnig, B. 1998. *Kreftene i mangfoldet. Nye lærings- og undervisningsformer*. Oslo: Kommuneforlaget AS.
- Reeve, J. 2005. *Understanding motivation and emotion*. Hoboken: Wiley.
- Skaalvik, E., and S. Skaalvik. 2013. *Skolen som læringsarena Selvoppfatning, motivasjon og læring*. Oslo: Universitetsforlaget.
- Strauss, A., and J. Corbin 1998. *Basics of qualitative research. Techniques and procedures for developing Grounded Theory*. Thousand Oaks: Sage Publications.

Back to contents



## Transition of teacher in-service trainings and research teacher ambitions in Hungary

*Magdolna Chrappán & Rita Bencze*

*University of Debrecen, Abigel Secondary School Debrecen, Hungary*

*chrappanm@gmail.com & de.ritabencze@gmail.com*

### Abstract

In Hungary-besides the general European professional trends-the significant changes in education policy taking place after 2010, especially professional requirement system of the “teacher’s life career model”, have put even more emphasis on teachers’ in-service trainings and also on the research of active teachers whose ambition is to gain a doctorate degree. At the University of Debrecen there has been going on a research in teachers’ in-service training attitude for three years: in the fall of 2011 and spring of 2014 surveys of 1400 were carried out. The questionnaire investigates attitudes towards in-service trainings, examines human resources, the content of in-service trainings and a set of questions deals with the future plans of in-service trainings. Apart from these another essential purpose of the research was to find out whether teachers are willing to join doctorate trainings and participate in public education research activities.

**Keywords:** in-service teacher trainings; research teacher; PhD-programmes for teachers; life career model in Hungary; EdD degree.

### Context of the research

In our paper we would like to present our research that looks into the common questions of teacher training, public education-research going on in Hungary now and the position of educational science. The research is based on three sources. (1) The needs for research-based teacher training in Hungary: on the one hand this means the development of research-based teacher training, and on the other hand it also means that the prospective teachers’ research attitudes must be formed. International data which show that there is a relation between the high standard of public education and teachers’ professional quality also verifies our efforts to focus on this kind of training. At this point we want to refer back to only one conclusion in the McKinsey reports of 2007 and 2010 which pointed out the correlation between school efficiency and the quality of teachers. The second report suggests that the prestige of teaching may be raised by enhancing the requirements for teachers’ professional development as well as by creating clearly defined teaching career stages: (2) The University of Debrecen wants to meet these needs, that is why we have started the “applied education research” doctorate subprogram and we would have liked to gather data regarding who may provide the potential recruitment base among practising teachers. In Hungary in the past four or five years the idea of introducing the British-American type of EdD degree has gained ground. However, the idea finally failed and only the PhD degree remained the only opportunity for teachers. It is a fact that in Hungary the University of Debrecen is the only institution which provides the research of disciplinary didactic for each subject within one programme: (3) Parallel with the on-going changes in teacher training (although irrespectively of it), the Teacher’s Life Career Model (Table 1) was introduced in public education in 2013. In this model we encounter with the concept of “research teacher”. We assume that among practising teachers there are many ambitious colleagues for whom obtaining the rank of research teacher means a challenging promotion.

It is clearly conceived in the Law of Public Education what level of payment may be reached at the different stages which is to promote the motivation of teachers to keep moving up the ranks.

Table 1. The Hungarian teacher life career model

Type of stage	The name of stages	Input conditions
Non-mandatory stages	Research Teacher	min. 14 years, 2nd qualifying procedure, PhD degree and publication activity
	Master Teacher	min. 14 years, 2nd qualifying procedure
Mandatory stages	Teacher 2	min. 8 years experience, teacher's qualification exam, 1st qualifying procedure
	Teacher 1	2 years experience, qualifying exam
	Probationer	MA teaching degree

### Research aims

On the basis of these we started a research in 2011 (this was carried on in spring of this year) which set four aims to achieve:

- (1) we wanted to disclose the potentials of practising teachers: how much they consider research as a challenging opportunity, to what extent they are interested in doctorate trainings, whether they are willing to take part in a PhD programme and if yes, what field would interest them most;
- (2) the second purpose was to identify prospective PhD students for our PhD-subprogram, so we wanted to know what level of qualification they have, how much time they spent in this profession already, what their pedagogical values are concerning teaching (we examined these with rank scales and attitude scales). We also asked them how much time they could spend on their training and to what extent they are overburdened with different school tasks;
- (3) we wished to define what doctorate programmes may or should be offered: we tried to reveal the fields where prospective research teachers would like to carry out researches and what types of trainings they participated in voluntarily or on a mandatory basis. We also wanted to define the typical and most needed in-service trainings, find out the needs of public education and tried to analyse them for further improvement of the programmes;
- (4) the final purpose was to analyse the first impacts of the Life Career Model after it came into force in 2013 in Hungary.

We were interested to know whether the interests and motivations of teachers changed regarding in-service trainings and whether the content of in-service trainings were influenced.

In the spring of 2014 there was a fast-paced first rating procedure of those teachers who met the requirements of having certain qualifications and work experience. During the procedure the teachers had to compile their portfolio of their previous 10 years (this meant about 100 documents) and after going through an evaluation phase they could get to the stage of “teacher 2”.

In the questionnaire of 2014 we put them questions about the impacts of this newly introduced evaluation system and we found that approximately one half of them (approximately 48%) felt that the new model would bring a positive change in their career path. These teachers as the data show belong to that generation which forms the group of potential PhD students.

### Theoretical framework

When dealing with teacher training, an integrated part of the issue is: how active teachers with research attitudes may be involved in doctorate trainings and research activities (Csapó 2008).

We have previously mentioned the dilemma of providing the suitable programmes for

teachers with different purposes.

Our findings suggest that there is a major move towards “research-based teacher education” although there are divergent views about the meaning of “research” in this context. However, the question should be raised what research should be offered to the different actors of education. And this leads us to the problem of the two scientific ranks that is the PhD and EdD degree. When we are speaking about the transition of teacher in-service trainings and research teacher ambitions in Hungary as the title suggests, one element of this issue we are to deal with is the increasing number of doctorate students.

This trend is not only a Hungarian feature exclusively; it is an overall phenomenon that may be observed not only in the American education system but in several European countries.

Kehm points out that in several European countries the number of PhD students has risen over the last 10 years. He mentions that in Spain there has been a 30% increase in doctoral students and Sweden the proportion of doctoral degrees nearly doubled in the 1990s. All in all the average figure of graduates undertaking doctoral training is between 5 and 10%. (Kehm 2006, 69-70).

Hungary is facing similar changes and consequently Hungarian policy makers and education experts must also find a solution for another complex issue that involves both pros and cons, namely whether PhD program should remain the only opportunity for those who are interested in research and academic progress, or along with this degree, a more practical EdD programme could be offered mainly for those practising teachers who would not be willing to find a position in higher education but are motivated to upgrade and deepen their previously gained knowledge in their fields. Although the number of those applying for doctorate programmes has grown (by eight per cent) in Hungary in the past decade, all in all there has been no significant change in the data of output, between 2001-2012 the number of those gained a PhD degree was stable. According to the statistics of the Hungarian Education Office the estimated figure is 1200-1300 persons/year (Education Office, 2014), that is why the strong demand for gaining a scientific rank within the frame of research teacher status brings about a serious dilemma.

As in Hungary according to the Law of Public Education only those may take a position in administration who have taken the teacher’s qualification exam with educational management specialization, it would be worth giving it a second thought whether an EdD degree would be more relevant for those who are preparing for managerial and administrative leadership in education, for example principals, teacher educators, evaluators and all those practising teachers who wish to use their knowledge to solve educational problems (Shulman et al. 2006).

One approach appears in the conference publication of EDITE 2014, which refers to several authors (Toom et al. 2008; Niemi 2008; Niemi - Jakku-Sihvonen 2011) who suggest that certain capacities must be built in teachers to conduct scientific research in their own daily practice, similarly to doctors which requires a certain level of “scientific literacy”. The views in respect of the two types of degrees are obviously controversial. There is still a debate going on what sort of scientific literacy is needed for those who wish to enter some kind of doctorate programme but with different purposes. If this could be clarified the function and position of the two ranks could be determined as well. Maybe the most clear cut definition is given by Townsend when she says that the main career goal of one getting an EdD can be the professional practice of educational administration, while gaining a PhD degree should mean research and scholarly work in the first place (Townsend 2002).

## **Research methodology**

The main questions at the heart of our research were the followings: teachers’ in-service training plans, willingness; their preferable paths of trainings; and their intentions of participating in doctorate trainings.

At the University of Debrecen there have been researches going on in teachers’ in-service training attitude for three years: in the fall of 2011 and spring of 2014, and altogether 1400 surveys were carried out. The research was paper-based, carried out via self-completed questionnaire query and the statistic data were worked up with SPSS 17 programme. Processing the data of 2014 is still

in progress, so this time we may show only some of the changes compared to the results of 2011.

The sample was made up of the teachers of two regions: Northern Great Plain and Southern Great Plain, the sample is representative in respect of the institutional structure.

In the figures below we see the distributions of institutions and we can see the different types of schools that responders we questioned came from.

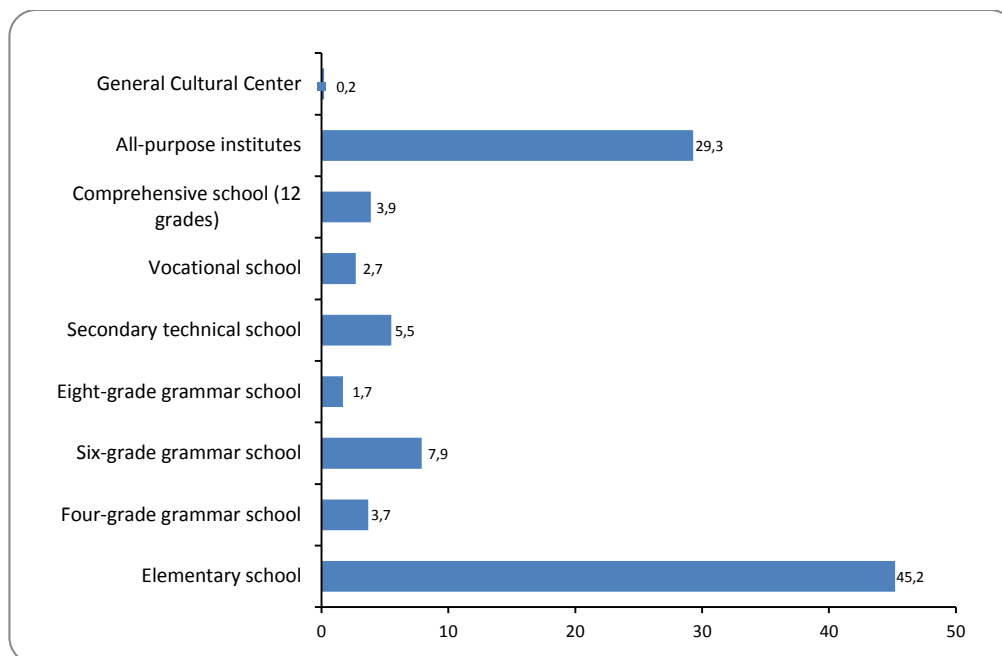


Figure 1. Rate of teachers asked according to types of schools (%); N = 1402

Two of these types of schools must be explained in more details: the all-purpose institute includes secondary grammar school, secondary technical school and vocational trainings. So it is a mixed type of institution; a General Cultural Centre typically appears in small or medium-sized towns or villages, where the elementary school and other cultural services, like library, cinema, recreation and arts trainings are all under one roof.

## Findings

### *Attitudes towards doctorate training*

Taking all these dilemmas consideration it is vital to find out more about teachers' attitude towards PhD degree. Further in our research we were looking for the answer to the question whether teachers are you likely to get a doctorate degree? Figure 2 shows the distribution of the answers of respondents based on the probability of gaining a PhD degree.

We may conclude that more than 16% of the respondents consider it possible to gain a PhD degree. This rate is especially significant considering the fact that in public education only 1% of all teachers may become research teachers at a given period. This fact was not solid when the first questioning was carried out. Enthusiasm, however, was really strong.

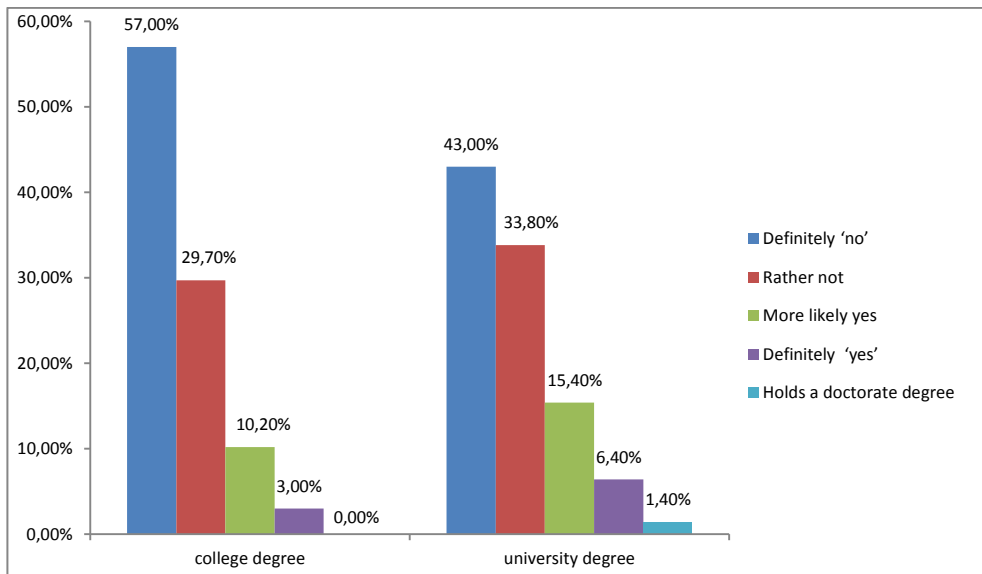


Figure 2. “Are you likely to get a doctorate degree?”; N = 1402

**Plans related to doctorate trainings**

It must be emphasized, however, that desires and applying for training are not the same, and it can be seen clearly in Figure 3 that only 10% of respondents who are definitely willing to study stated that they would choose some kind of doctorate training. Those who answered with yes to this question, we called the “group of preferring PhD training” and the rest are those who do “not prefer PhD training”. These two groups will be examined as sub-samples from now on. Figure 3 shows the distribution of the two sub-samples based on the different school types.

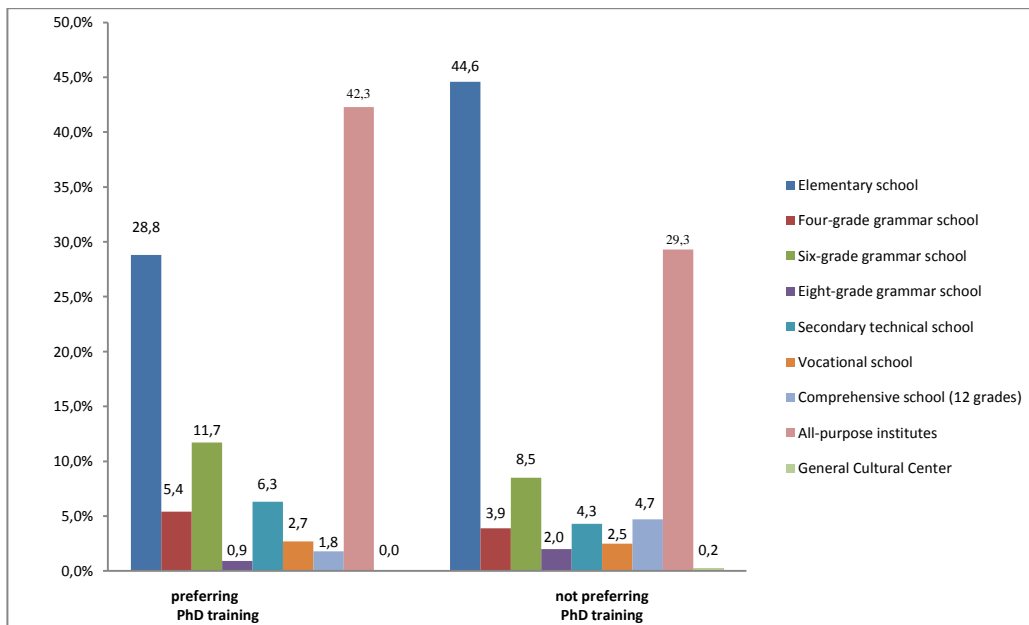


Figure 3. The groups of preferring and not preferring PhD program according to school types; N = 1402

**The typical candidate for doctoral training**

In the two groups the most significant difference was in terms of the average age and the number and level of degrees gained. More than one-third of those preferring PhD program was men, in the other group this rate was only one-fifth.



The members of the first group are 10 years younger and the number of the first, second and even third degree is much higher than in the other group. And the number of the first, second and even the third university level graduate degree is much higher than in the other group.

Table 2. Main features of the two groups

Items	Preferring PhD program	Not preferring PhD program
Rate of genders	35.7% men	22.1% men
Average age	38 years	48 years
First university degree	44.7%	27.6%
Second university degree	59.8%	44.4%
Third university degree	89.5%	68.9%
Time spent on studies per week	7.4 hours	5.3 hours

These data represent the original difference between learning ambitions and attitudes, presumably this was the strongest variable.

We also asked them how much time they would spend on the training and although it is true that the time they indicated is not much in case of PhD studies, we can still conclude that the 40% plus expresses strong determination.

Our findings confirm the Green theory, which states that the social relevance of qualifications can be sustained by obtaining higher and higher certificates (Green et al. 1980).

The data indicated in the Table 1 show clusters of typical ages and genders more willing to participate in a doctorate training and the correlation between the numbers of degrees already obtained and the willingness to start a PhD program.

Based on the data above we tried to draw up the profile of the potential research teacher. The general features of those who preferred the PhD program based on the data of 2011 are as it follows: they graduated from university 10-12 years ago; they have several degrees (2-3); have leader's ambition (they are not at present); professional progress means inspiration for them; work at secondary schools; would like to work in higher education.

### ***After introducing the life career model***

At this point we must highlight some facts that indicate certain changes that came up during the survey of 2014. Although these data have not reached the level of the 2011 survey, still it seems to be enough to make some presumptions and suggestions for teacher training. Nowadays one of the hottest issue is making the portfolio which had to be made by only those students so far who took part in the Bologna system teacher training.

The most important change related to the life career model is that a larger number of trainings provide typically teacher's qualification exam, which is one pre-condition of getting to a higher career stage. We may also conclude that the in-service system is being restructured these days: the number of those preferring doctorate trainings is being decreased: from 16.7% to 10.4%. Another interesting figure is how the average age of those decreased who would prefer to start a doctorate training. The average age of potential PhD students dropped by 4 years: from 38 year to 34 year.

### ***Main features of the two groups - their change in the field of interest***

The following chart shows the main changes in the fields chosen by those who plan to gain a PhD degree. In figure 4 we tried to compare the data of two years, 2011 and 2014, and we wanted to show if there was any change preference towards these disciplines in the two years.

First of all we can state that most of the respondents chose to study some scientific problems of their subjects (65.9% in 2011 and 65.9% in 2014). This means that in this respect there was no

change in students' motivation and we can also conclude that the least favourable fields were educational economy. At the same time education management have become a much more preferred field in 2014 compared to the year of 2011.

We may say that at our university a continuously growing proportion of teachers are taking part in several types of professional development activities, and we can say that those who are willing to enter a PhD program are more interested in high prestigious research work and publications.

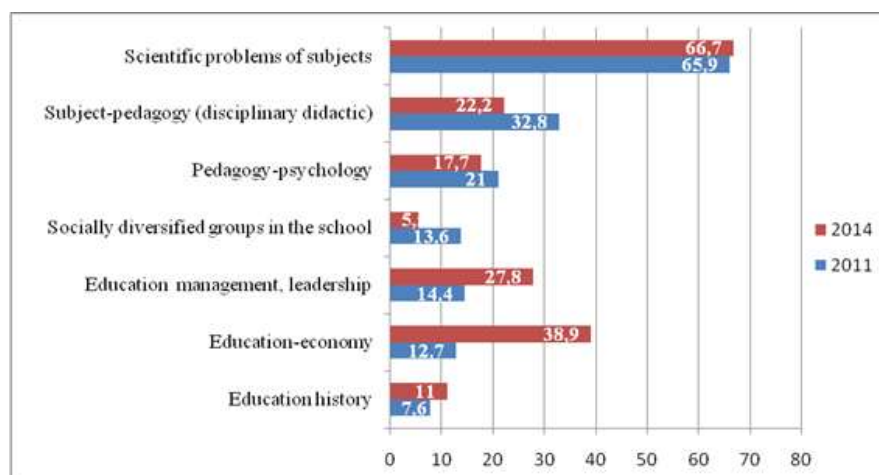


Figure 4. Changes in the fields of interest of those who plan to gain a PhD degree between 2011-2014 (N= 1382 (2011); N= 458 (2014))

So, it is not surprising that the preference of education management and leadership rose from 12.7% in 2011 to 38.9 % in 2014, which is a significant upward movement. All these, however, mean a great responsibility for teacher training institutes, because they must consider the needs of teachers and must provide retraining and upgrading programs that meet teachers' special needs.

Table 3. Changes of the training preferences

	2011 (N=1382)		2014 (N=458)	
	preferring	not preferring	preferring	not preferring
Assessment, qualification exam	3,07	2,95	3	3,09
Communication	2,45	2,72	2,55	2,69
Competence-based learning	2,29	2,63	2,1	2,86
Curriculum improvement	2,23	2,08	2,4	2,31
Disciplinary training	3,58	3,66	3,82	3,62
Foreign language	2,89	2,77	3,09	2,91
Gaining a new degree	2,70	2,31	3,1	2,19
Health care training	2,32	2,41	2	2,62
ICT	2,67	2,84	2,9	3,15
Leadership, management training	2,30	1,86	2	1,72
Measurement, assessment	2,23	2,28	2,36	2,34
Methodology	3,05	3,29	3	3,42
Preparation for research work	2,79	1,70	3,4	1,45
Professional networks	2,75	2,16	3,1	1,98
Research, publication	2,90	1,69	3,4	1,53
Talent development	2,93	3,10	2,9	3,26
Training on inclusive education	2,05	2,16	2,1	2,16
Training on helping disadvantaged pupils	2,08	2,46	2,5	2,32

In both questionnaires we examined on a four-grade Likert-scale what topics teachers would prefer throughout in-service trainings or what type of trainings they would be willing to participate

in. The two sub-samples (those who prefer and do not prefer a PhD programme) show significant variations in certain fields - yellow indicates the ones chosen mainly by the PhD preferring group and blue indicates the other group's choices.

During the three years between the two surveys the group of preferring doctorate training has decreased, but their motivation has grown in fields which are crucial in terms of obtaining a doctoral degree: gaining a new degree, preparation for research work, research, publication, professional networks.

With the diminishing age of the PhD preferring group it becomes obvious that there has appeared the young generation of teachers in the profession who consider research an integrated part of their career and regard scientific research as a determining daily experience even during their undergraduate studies.

### **Conclusions and implications for teacher education**

Finally, if we want to sum up the main points of our research results we may conclude the following:

- (1) the younger generations are more and more motivated to obtain a PhD degree;
- (2) the elder generations are more interested in shorter, four-semester long courses that provide qualification exams, which helps them in getting to a higher career stage;
- (3) teacher training institutes must restructure their trainings to meet the new needs of in-service trainings;
- (4) research teacher competences must be developed in students during their graduate studies;
- (5) it may be worth considering the introduction “of EdD-degree, because practising teachers” who would be motivated to participate in scientific work are unlikely to fulfil the requirements of PhD.

According to the data of 2014 85% of population who were interviewed, said that the career model would not or just hardly change their career plans. The average age of those affected by the career model is around 40. We must take into consideration and systematically build up our in-service training offers and program structure.

The most essential consequences for teacher training are the following: it is a must to harmonize the requirements of the life career model as well as the structure of teacher training and in-service training. During this process formalized conciliation and collaboration mechanisms should be worked out between the teacher training tertiary education institutes and the management of public education (in Hungary this system is being formed at present). Higher education and within this doctorate trainings must provide the conditions of research in order to reach the highest, so called research teacher status; disciplinary methodology and research fields focusing on public education pedagogical processes must be strengthened as well. Another vital prerequisite is to sensitize and prepare students for research tasks and attitudes during their MA teacher training. For practising teachers, special courses, trainings must be offered to prepare them for doctorate programmes.

One of the hottest higher education-policy issues is the controversy of the decreasing demand for scientific ranks and the need for introducing the EdD degree because of the limited quota of PhD trainings as well as the attitudes towards doctoral programmes in this respect.

### **Acknowledgements**

This work was supported by the European Social Fund and the Hungarian Government under Grant TÁMOP-4.1.2.B.2-13/1-2013-0009 the Enhancing the regional networks of professional services and research activities to support teacher development in the North-east region of Hungary.

## References

- Bárdos, J. 2011. Miért nincs Magyarországon pedagógia doktori (Ed.D.) fokozat? *Pedagógusképzés*, 9 (38): 1-2.
- Csapó, B. 2008. A kutatásalapú tanárképzés és tanártovábbképzés. A képzés végén, a pálya kezdetén - Útkeresés a közoktatás és a felsőoktatás együttműködésében konferencia. Tempus Közalapítvány. *Budapest, 2008*. [http://oktataskepzes.tka.hu/pages/content/index.php?page\\_id=993](http://oktataskepzes.tka.hu/pages/content/index.php?page_id=993)
- EDiTE. 2014. *Teacher education and teacher education policies in Europe*. Issues paper for the European Doctorate in Teacher Education final conference. 3rd-4th July 2014. Budapest. [http://www.edite.eu/files/ISSUES\\_PAPER\\_%20final\\_conference\\_%28201405%29.pdf](http://www.edite.eu/files/ISSUES_PAPER_%20final_conference_%28201405%29.pdf).
- Green, T., D. Ericson, and R. Seidman. 1980. *Predicting the behaviour of the educational system*. Syracuse University Press.
- Townsend, B. 2002. *Rethinking the Ed.D., or What's in a Name?* A paper prepared for the Annual Meeting of the Association for the Study of Higher Education, Sacramento, California, November 21-24, 2002. [http://www.usc.edu/dept/chepa/pdf/ASHE\\_townsend.pdf](http://www.usc.edu/dept/chepa/pdf/ASHE_townsend.pdf)
- Kehm, B. 2006. “Doctoral education in Europe and North America: a comparative analysis.” In *Wenner-Gren International Series*, vol. 83, *The Formative Years of Scholars*, edited by U. Teichler Germany: Portland Press Ltd. <http://www.portlandpress.com/pp/books/online/fyos/083/0067/0830067.pdf>
- Kovács, E. 2011. “A tanárképzés harmadik ciklusa - kérdések és lehetőségek.” *Educatio*, 4: 580-586.
- McKinsey Report. 2007. *How the world best-performing school systems come out on top?* [http://mckinseysociety.com/downloads/reports/Education/Worlds\\_School\\_Systems\\_Final.pdf](http://mckinseysociety.com/downloads/reports/Education/Worlds_School_Systems_Final.pdf).
- McKinsey Report 2010. *Mourshed, Mona, Chijioko, Chinezi and Barber, Michael: How the world's most improved school systems keep getting better?* [http://mckinseysociety.com/downloads/reports/Education/How-the-Worlds-Most-Improved-School-Systems-Keep-Getting-Better\\_Download-version\\_Final.pdf](http://mckinseysociety.com/downloads/reports/Education/How-the-Worlds-Most-Improved-School-Systems-Keep-Getting-Better_Download-version_Final.pdf).
- Niemi, H. 2008. “Advancing research into and during teacher education.” In *Teacher education Policy in Europe: a voice of Higher Education Institutions*, edited by B. Hudson and P. Zgaga, 183-208.
- OECD. 2007. *A tanárok számítanak. A hatékony pedagógusok pályára vonzása, fejlesztése és a pályán való megtartása. Oktatási és Kulturális Minisztérium EU Kapcsolatok Főosztálya. Budapest. Oktatási H. 2014. Felsőoktatási statisztikák a 2011-2012. Tanévről.* [http://www.oktatasi.hu/felsooktatasi/felsooktatasi\\_statistikak/!DARI\\_FelsooktStat/oh.php?id=fir\\_int\\_stat&fir\\_stat\\_ev=2012](http://www.oktatasi.hu/felsooktatasi/felsooktatasi_statistikak/!DARI_FelsooktStat/oh.php?id=fir_int_stat&fir_stat_ev=2012)
- Shulman, L., C. Golde, A. Bueschel, and K. Garabedian. 2006. *Reclaiming education's doctorates: a critique and a proposal*. [http://www.cpedinitiative.org/files/Reclaiming%20Ed%27s%20Doctorate\\_Shulman%20et%20al%20%282006%29\\_0.pdf](http://www.cpedinitiative.org/files/Reclaiming%20Ed%27s%20Doctorate_Shulman%20et%20al%20%282006%29_0.pdf)
- Tóth, Z. 2012. “‘S ki viszi át fogában tartva’ a kutatási eredményeket a „túlsó partra? A kutatótanár/tantárgy-pedagógiai doktori (PhD) képzés Magyarországon - helyzetkép.” In *A tanárok tanárának lenni*, edited by G. Pusztai, I. Fenyő, and A. Engler, 40-53. Debreceni Egyetem Felsőoktatási Kutató és Fejlesztő Központ. Debrecen.
- Toom, A., L. Krokfors, H. Kynäslähti, K. Stenberg, K. Maaranen, R. Jyrhämä, R. Byman, and P. Kansanen. 2008. *Exploring the essential characteristics of research-based teacher education from the viewpoint of teacher educators*. [http://www.pef.uni-lj.si/tepe2008/papers/Toom\\_etal.pdf](http://www.pef.uni-lj.si/tepe2008/papers/Toom_etal.pdf)

Back to contents



## Investigating representations of ratio among prospective primary teachers in Ireland: implications for teacher education

*Elizabeth Oldham<sup>1</sup>, Patsy Stafford<sup>1</sup> & Valerie O’Dowd<sup>3</sup>*

*<sup>1</sup>Trinity College Dublin, <sup>2</sup>Maynooth University, <sup>3</sup>Marino Institute of Education, Ireland*

*eoldham@tcd.ie, Patsy.Stafford@nuim.ie & Valerie.odowd@mie.ie*

### Abstract

The concept of “ratio” has been identified as problematic for many students and at least some teachers of mathematics. The need to address this area of teachers’ content knowledge for teaching through appropriate teacher education has been acknowledged. In 2011, in an attempt to address this issue, the Science and Mathematics Education RDC at ATEE initiated a study of prospective teachers’ content knowledge of ratio for teaching mathematics and science. Building on this work, an Irish study in 2013 collected more data: from prospective secondary teachers and also from mathematics students taking a module on mathematics education. A further study is currently extending the Irish work, broadening the investigation to include prospective primary teachers in Ireland. The paper reports on this study, presenting and discussing the findings with reference to the previous Irish work. Applications in teacher education classes are considered.

**Keywords:** ratio; proportional reasoning; representations; teachers’ content knowledge.

### Context of the research

The concept of “ratio” is fundamental in students’ development of proportional reasoning skills and hence their grasp of many mathematical concepts. However, evidence points to ratio being a problematical area for many students and also for at least some teachers of mathematics. In view of the importance of teachers’ content knowledge for teaching, the latter situation needs to be addressed through appropriate teacher education: first by ascertaining the extent of the problem and then by developing suitable approaches to improving the situation where necessary.

At the 2011 ATEE annual conference, the Science and Mathematics Education RDC initiated a study of prospective teachers’ content knowledge of ratio for teaching mathematics and science. An instrument was devised to elicit the meanings that respondents ascribed to “ratio,” the uses (both their own and other people’s) of ratio that they identified, and the ways in which they represented the concept by symbols and drawings. Data were collected at four institutions involved in teacher education. A grounded theory approach was used in order to analyse the meanings and representations offered; then, following Skemp’s (1976) seminal work on types of understanding, conjectures were made with regard to indicators that respondents possessed “relational understanding” of ratio. The findings were reported at the 2012 conference. Since then, data were collected from further groups. The major focus in reports to date has been on documenting the meanings and representations provided by the different cohorts of students; however, an Irish study in 2013 opened up the possibility of using the instrument as a learning tool in teacher education classes as well as for research purposes.

### Research aims

The present study extends the Irish work, considering prospective Irish primary teachers for the first time. It investigates the meanings and representations of ratio that are offered by participating students from primary teacher education courses in Ireland, and seeks to extend the discussion among teacher educators regarding productive uses of the instrument and how these might be complemented by other approaches.

The paper begins with an overview of literature related to ratio and proportion and representations, providing the theoretical framework for the research. The work is then set in the

context of the ATEE Ratio Project. The methodology and findings of the current Irish study are reported, and the paper concludes with discussion and consideration of implications for teacher education.

### **Theoretical framework**

The main focus of the review in this paper is on work related to ratio and proportion, particularly that geared to supporting teachers in their teaching of ratio. Literature on representations is also considered.

#### ***Ratio and proportion***

The importance of ratio and the associated area of proportional reasoning in school curricula is highlighted in a research brief from the USA National Council of Teachers of Mathematics (NCTM) that focuses on teaching ratio and proportion in the middle grades. It points out the fundamental role played by the topics in providing a basis for major areas of the school curriculum: “Students’ ability to reason proportionally affects their understanding of fractions and measurement in elementary school, and it supports their understanding of functions and algebra in middle school and beyond” (Ellis 2013, 1). The emphasis that the NCTM gives to helping teachers address difficulties in teaching a cluster of ratio-related concepts is reflected by their recent publications in the area, notably in the teachers’ journal “Mathematics Teaching in the Middle School”. A focus issue on rational number sense includes an article specifically addressing the teaching of ratios (Hunter, Bush, and Karp 2014). Relevant articles also appear in other recent issues (see for example Banker 2012; Cohen 2013; Rutchi and Bennett 2013).

Such articles build on research that has been developing for over three decades. Pioneering work was done in England by Hart and her team in the 1970s and 1980s (Hart 1981, 1984; Hart et al. 1989). From the 1990s, one of the most notable contributors has been Lamon, who referred to the need to “move beyond the level of identifying a litany of task variables that affect problem difficulty, towards the identification of components that offer more explanatory power for children’s performances in the domain” (Lamon 1993, 42). Later, she provided a state-of-the-art summary and analysis of research in the area (Lamon 2007). With regard to teachers’ rather than school students’ knowledge of ratio, although research is in somewhat short supply, Australian work is prominent. Livy and Vale (2011) found low levels of correct responses to relevant ratio and proportion test items in their study of 297 prospective primary teachers in the first year of their course; Chick’s (2010) study of 40 practising secondary teachers identified deficiencies in their knowledge for teaching ratio.

Despite so much attention being paid to the topic of ratio, there is some confusion about the definition of the concept. The NCTM research brief (Ellis 2013) refers to the importance of students being able to attend to two quantities simultaneously, thus invoking developmental issues that date back to the work of Piaget. However, the question arises as to whether the two quantities can be in a part-whole relationship such as that for the numerator and denominator of a fraction. Hunter, Bush, and Karp (2014, 363) explicitly state: “a ratio can represent a part-whole, part-part, or whole-part relationship.” They note that students can have problems with ratios  $x : y$  where  $x$  is greater than  $y$ , and relate this to students’ familiarity with fractions as representing part-whole relationships, together with their belief that one cannot have a numerator larger than the denominator. In her early work, Lamon (1993) refers to part-part-whole relationships. Her examples include “classes with a ratio of  $X$  boys to  $Y$  girls or collections of test questions with a ratio of  $P$  correct to  $Q$  incorrect answers” (Lamon, 1993, 42); thus, focus is on the entire class or test as well as on the two component parts. Clark, Berenson, and Cavey (2003) suggest that preference may be given to models clearly involving two distinct variables, while part-whole relationships may be situated in the intersection between ratio and fraction. For the ATEE Ratio Project, mentioned above and described more fully below, meanings and representations “clearly reflecting two variables” are taken as better indicators of relational understanding than are those based on a part-whole concept, especially if the latter are presented alone. However, for purely

symbolic representations of ratios, the use of fractions or quotients (representations involving division) is unproblematically correct (see Oldham and Ni Shuilleabhain [2014]; that paper contains a fuller account of some topics addressed in the present literature review).

A second area of confusion concerns proportion. With regard to the teaching of ratio and proportion, Ellis (2013, 1) refers to “a proportion” as “a relationship of equality between two ratios” and discusses delaying introduction of the so-called proportion algorithm until some understanding of ratio and been developed (see also Cohen [2013]). This highlights some areas of difference between treatment of the topics in the USA and in some other countries. The Irish curriculum, in particular, does not make use of the formal definition of a proportion, and the curriculum documents and textbooks do not refer to a “proportion algorithm” as such (see for example NCCA [1999]). A commonly-occurring approach for lower second-level grades is the use of “unitary method”, illustrated by the following solution to the example “If 5 apples cost €2, how much do 8 apples cost?” (Figure 1).

Cost in euro of 5 apples:2.00
Cost in euro of 1 apple: $2.00 / 5$ , i.e. 0.40

Figure 1. Unitary method calculation

While Hunter, Bush, and Karp (2014, 365) suggest a similar approach - focusing on the unit cost for another “price” example en route to obtaining the full solution - they do so in a way that suggests that the strategy is not familiar to the American teachers they primarily address. Such unit-based approaches may avoid some arbitrary symbol-pushing that can arise from the use of cross-multiplication in a proportion. However, in the Irish context, research would be needed to find if teaching a “unitary method algorithm” supports or inhibits the development of proportional reasoning, as well as enhancing or diminishing the understanding of equations that might follow from an explicitly algebraic formulation.

### ***Representations***

Representations have been considered for many years, for example in Dienes’s variability principles (see Gningue [2006]). These principles influenced important developments in the 1980s (Lesh, Behr, and Post 1987; Lesh, Post, and Behr 1987; see also Kaput [1987]). By the turn of the twenty-first century, it was generally agreed that “use of particular modes of representations (e.g. visual or concrete) leads to improvement of students’ mathematical abilities and development of their advanced problem solving and reasoning skills... the use of “multiple representations” facilitates students’ development of mathematical concepts” (Pape and Tscoshanov 2001, 120, emphasis added). More recently, writing about students with mathematical learning difficulties and taking a Vygotskian perspective, Lewis (2014) asserts such students’ difficulties may evolve around their different understanding or use of mathematical representation. Recent contributions in “Mathematics Teaching in the Middle School” emphasising the importance of representations include articles such as those by Cohen (2013), Ruchti and Bennett (2013), and Hunter, Bush, and Karp (2014). Cohen, while focusing mainly on the use of strip diagrams with school students, notes that the diagrams are also “an excellent sense-making context among pre-service teachers” (Cohen 2013, 542).

It should be noted that neither ratio and proportion, nor representations, figure strongly in mathematics curricula in Ireland, nor have they been the subjects of much Irish research (Oldham and Ni Shuilleabhain 2014). The present study is part of an attempt to address that situation.

### ***The ATEE Ratio Project***

As pointed out above, the ATEE Ratio Project was initiated in 2011 to study prospective teachers’ content knowledge of ratio for teaching mathematics and science. A one-page instrument



was devised, containing four items:

1. What does the term “ratio” mean to you?
2. a. When do you use ratios?  
b. Who else uses ratios?
3. How do you represent a ratio using mathematical symbols?
4. Draw several representations of how ratios are used.

The instrument was intended to take only ten to fifteen minutes to complete. In 2012, data were collected at four institutions involved in teacher education: two in the USA, one in Ireland and one (utilising an appropriately translated version of the instrument) in Portugal. A grounded theory approach was used to analyse the meanings and representations offered, and three emergent themes were identified. Some descriptions or representations emphasised or allowed the inference that the participants’ concepts included the notion of “two distinct variables”; some appeared to refer to “uses or applications” or special types of ratio; and some related to “part-whole” relationships. Examples of key aspects to which participants referred in their responses to item 1 are given in Table 1.

Table 1. Emergent themes for participants’ descriptions of the meanings they ascribed to ratio

Two variables	Uses / Applications	Part / whole
Comparison Relationship	Rate Scale Odds Proportion Division / splitting Percent	Fraction Decimal Percent?

Analysis of the meanings and representations in the light of literature led to the conjecture that “participants who offered meanings reflecting two variables, and who provided many, varied, and relevant representations, possessed relational understanding of ratio” (Berenson et al. 2013).

Almost all the respondents for the original (2012) study were prospective teachers preparing to teach at primary or secondary school. Data collected from further groups of students also include responses from science majors (Price 2014) and mathematics specialists (Oldham and Ni Shuilleabhain 2014). As mentioned above, the main focus has been on documenting the meanings and representations provided by the different cohorts of students. Attempts to categorise individual students’ level of understanding only on the basis of their responses to the instrument have not been productive; the data in general are not rich enough for inferences to be made. A respondent supplying words such as “comparison” or “relationship” in a response to item 1, and thus appearing to espouse a two-variable meaning for ratio, may be recalling a definition or description not fully understood; conversely, an ambitious but technically flawed response produced in the short time available may not do justice to a respondent’s understanding as would a more reflected answer. Development of an interview schedule was considered early on (Berenson et al. 2013); the Irish study in 2013 raised the possibility of using the instrument as a learning tool in teacher education classes (Oldham and Ni Shuilleabhain 2014).

The instrument has undergone some local modifications since its first use. The changes have attempted to address problems in eliciting rich data from the respondents.

- Most attention has been paid to item 4. Four of the 16 Irish respondents in the 2012 group made no response to the item; they may have been constrained by a literal interpretation of the requirement to “draw” their representations. While some respondents presented very interesting drawings, some provided rather scrappy pictures or diagrams, and others used symbols or words rather than drawings. For the study carried out in 2013, an expanded item was devised: “What representations - drawings, charts, graphs, words, and so forth - might you use to explain ratio and show how it is used? “Present your ideas here and/or overleaf as you wish.””. The change was successful in that all Irish participants in 2013

responded to the amended item, but they tended to rely on verbal explanations, and their drawings lacked the richness of the best responses in the original set (Oldham and Ni Shuilleabhain 2014).

- A Portuguese study in 2013 used a similar item. Some rich data were obtained, though 14 of the 81 participants - a higher number than for the other items - did not respond (Fernandes and Leite, 2015).
- For item 3, the original Irish respondents tended to give the correct but unilluminating response “:” (the colon symbol) - perhaps with an example such as  $3 : 2$  or  $x : y$ . The item in the 2013 Irish study was amended to read “How do you represent a ratio using mathematical symbols? If relevant, indicate clearly which is/are the main symbol(s) but list others as well. “You may write expressions that include the symbols, rather than just the symbols themselves.””. This produced a richer set of responses (Oldham and Ni Shuilleabhain 2014).
- For item 2: the 2013 Portuguese study amended item 2b so that, when translated into English, it read “Who else uses ratios, and when do they use them?”

### Research methodology

The present Irish study includes prospective primary teachers in Ireland for the first time. It addresses three research questions:

- (a) What meanings and representations of ratio are offered by participating students from primary teacher education courses in Ireland, and how do these compare with meanings and representations provided by previous Irish and other participants?
- (b) How useful are the data in exploring the students’ relational understanding of ratio?
- (c) In the opinion of participating teacher educators, can the instrument be used, or developed, to provide for a class activity that will allow prospective teachers to reflect on and clarify their own understanding of ratio?

The version of the instrument used in Ireland in 2013 was amended to delete the reference to explanation from item 4, aiming to elicit more pictorial representations. The amended item read “What representations - drawings, charts, graphs, words, and so forth - might you provide to illustrate how ratio is used?”

After suitable ethical clearance, data are being collected from students in primary teacher education courses. Copies of the instrument are distributed to the students, typically at the beginning or end of a relevant lecture period, allowing some ten to fifteen minutes for completion. The students whose responses are used in this paper are graduates who were undertaking an eighteen-month Postgraduate Diploma course in Primary Teaching (PDPT); they had varied academic backgrounds and, in particular, very varied levels of achievement in mathematics. This group, PDPT 2014, is notably different from those in previous Irish studies: prospective secondary teachers taking a module on mathematics pedagogy as part of their Postgraduate Diploma in Education (the 2012 cohort - henceforth labelled PDE 2012), and the equivalent group together with undergraduate mathematicians who had opted for a module on mathematics education (the 2013 cohort - subdivided into PDE 2013 and Maths 2013).

The data were coded by one author and checked by a second author, using categories developed during earlier work in the Ratio Project, expanded or otherwise amended where necessary. When discrepancies arose (in a small number of cases), they were resolved by discussion. The coded data allowed research question (a) to be addressed; that question is the main focus of the present paper. Ongoing discussions among participating teacher educators (including the authors of the paper) focus on research questions (b) and (c), discussed more briefly below.

## Findings

Fifty-nine completed or partially completed instruments were collected from the PDPT 2014 cohort. Table 2 shows the numbers in this cohort together with those in the cohorts involved in earlier Irish phases of Ratio Study.

Table 2. Numbers of participants in the Irish Ratio studies, by group

Year	Course	N
2014	PDPT 2014	59
2013	PDE 2013	20
	Maths 2013	13
2012	PDE 2012	16

Analysis of responses to items 1, 3 and 4 - the items focusing on meanings and representations - are presented below. Comparisons are made with previous Irish cohorts, noting cases for which the wording of the items varied over the three years. Comparisons are in percentage form, but small size of 2012 and 2013 groups should be borne in mind; emphasis is on looking for indicative trends rather than for statistical significance. Thus, comparative data are represented visually below by means of bar charts rather than tables.

### *Meanings of ratio: responses to item 1*

Responses to item 1, giving the meanings ascribed to ratio, were coded using the three themes shown in Table 1 above. The results are set out in Table 3. The total percentage is more than 100 because some students made multiple responses within or across themes. Seven students gave two responses reflecting two variables; details are given only for this theme because of the small number of responses for the other two. Four students did not respond (or, in the case of one, drew a large question mark): a “first” for Irish data. The number of “other two-variable” responses - judged to refer to two variables, but not explicitly mentioning comparison or relationship - is greater than in previous years. An example is “The correspondence of two numbers, e.g. 1:30 - 1 teacher to 30 pupils.”

Table 3. PDPT 2014 group referring to themes in responses to item 1: numbers and percentages

Meanings	PDPT 2014 N		PDPT 2014 %
Two variables	Comparison	16	
	Relationship	13	
	Other two-variable	23	
	Total no. students	45	
Uses etc.		13	22.0
Part-whole		6	10.2

Comparisons with previous groups for the three main themes are shown below (Figure 2). The low percentage for “uses” for PDPT 2014 reflects, in particular, that few references were made to concept of proportion.

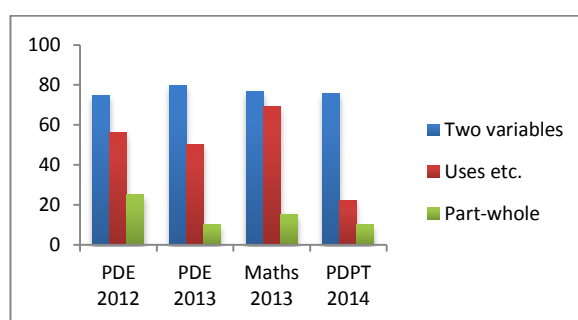


Figure 2. Percentages of each Irish group referring to the three themes in responses to item 1

### **Representation by mathematical symbols: responses to item 3**

Codes for item 3 used seven categories. These are: colon (with or without examples); “to” or “is to” (with or without examples); fraction (including division and decimal notation); percentage; other symbolic response; drawing; and other responses (including words).

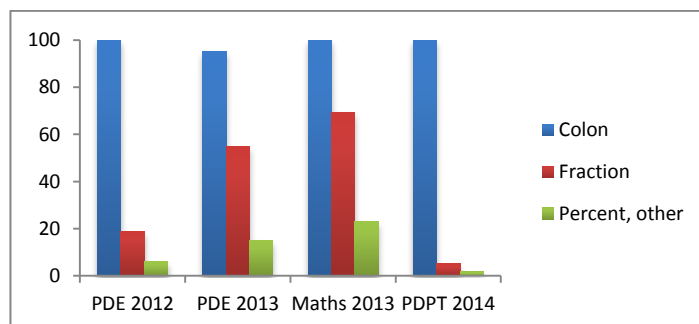


Figure 3. Percentages of each Irish group using each main type of symbolic representation in responses to item 3

Figure 3 shows the response percentages for “symbolic” responses: use of the colon (with or without examples); reference to or examples using fractions (or decimals or expressions with the division slash); and percentages and other symbolic responses (combining two categories because of small numbers). Thus, responses using the notation “ $x$  to  $y$ ” and variations on it are excluded from Figure 3, as are drawings and purely verbal offerings. All PDPT 2014 respondents provided the colon, some specifying that it is the main symbol used. However, there was less use of or reference to different types of symbol than in previous years - in fact less variety than with the original Item 3 (used with the PDE 2012 group), which did not ask for multiple representations or examples.

The question of multiple representations is addressed in Figure 4. The figure records the percentage of each Irish group that used more than one “type” of representation - symbolic or otherwise - and also the percentage that provided more than one “example” (perhaps using the same type of representation). This again reflects the paucity of rich responses from the 2014 group, especially compared with the cohorts from 2013, who responded to the identical item. Moreover, two 2014 students provided a symbolic response accompanied by a verbal one that may have been intended only to translate the symbolic version into language (for example, “2:1 Or two for every one”); so the numbers may over-represent the students’ intentions.

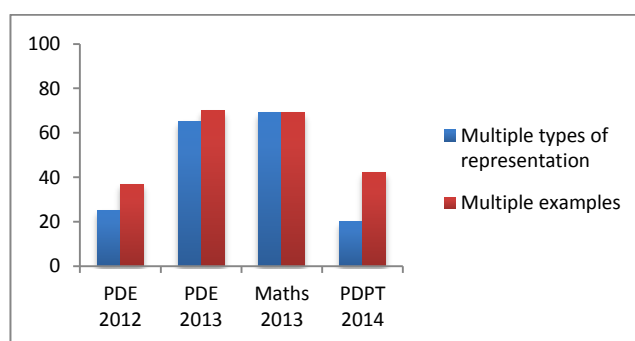


Figure 4. Percentages of each Irish group using multiple types of representation/multiple examples in responses to item 3

It is of interest to note that one student specified that for  $x : y$ ,  $x$  must be greater than  $y$ ; this is in contrast to the finding by Hunter, Bush, and Karp (2014), cited above, that students have problems with the case when  $x$  is greater than  $y$ . (Perhaps surprisingly, one student in the Maths 2013 group specified that  $x$  should be less than or equal to  $y$ .)

### *Representations for use of ratio: responses to item 4*

Responses to item 4 were coded as pictorial (diagrams; graphs or charts; and drawings) or non-pictorial, and also as to whether they clearly provided a two-variable representation.

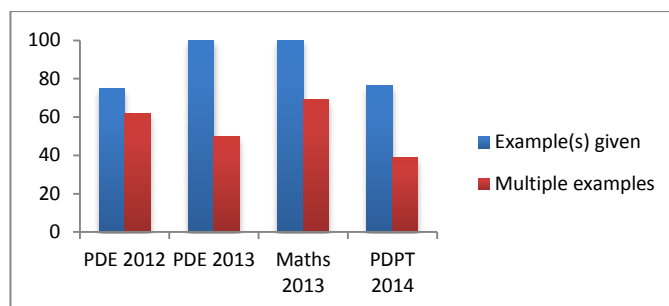


Figure 5. Percentages of each Irish group providing (multiple) examples in responses to item 4

Figure 5 displays the percentages of students in each Irish group who responded (provided at least one example) and who provided multiple examples. It shows that almost a quarter of PDPT 2014 cohort did not respond, and that less than two-fifths gave more than one example. This again provides a contrast, notably with the 2013 cohorts, who were presented with a similar though not identical item.

Figure 6 reports on two areas of interest: choice of a representation that clearly reflects the preferred two-variable meaning for ratio, and provision of a pictorial representation (diagram, chart/graph, or picture). For the PDPT 2014 cohort, the occurrence of two-variable “representations” is considerably more rare than the provision of two-variable “meanings” (Figure 2 above). However, for many verbal examples and indeed for some pictorial ones, insufficient detail was provided to show if a two-variable meaning was intended - as for instance in a response such as “pie charts” or a circle without appropriately labelled sectors. Hence, for PDPT 2014 - and for other cohorts - Figure 6 may under-represent the respondents’ understanding of ratio. Alternatively, values in Figure 2 may reflect knowledge of keywords rather than understanding of their meaning.

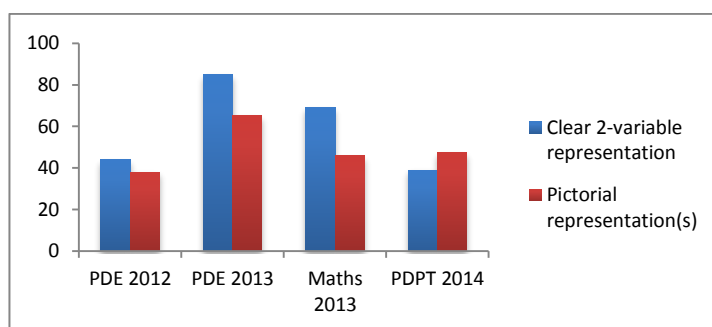


Figure 6. Percentages of each cohort providing clear two-variable representations and providing pictorial representations in responses to item 4

Examples of “pictorial” responses by the PDPT 2014 group are shown in Figures 7 and 8. Figure 7 displays some of the responses indicating a two-variable understanding; some responses that do not represent two variables clearly are shown in Figure 8.

The drawing in Figure 8 is a “borderline case.” However, the same symbol is used on either side of the colon; by contrast, in Figure 7, two different symbols are used. In the work of the Ratio Project, the use of just one symbol in such drawings has been judged as a less good indicator of relational understanding than the use of different symbols (Berenson et al. 2013). Of the “verbal” responses, typical examples include “For every football team, there is one manager” (two distinct

variables) and “Pie chart, bar charts” (not clear).

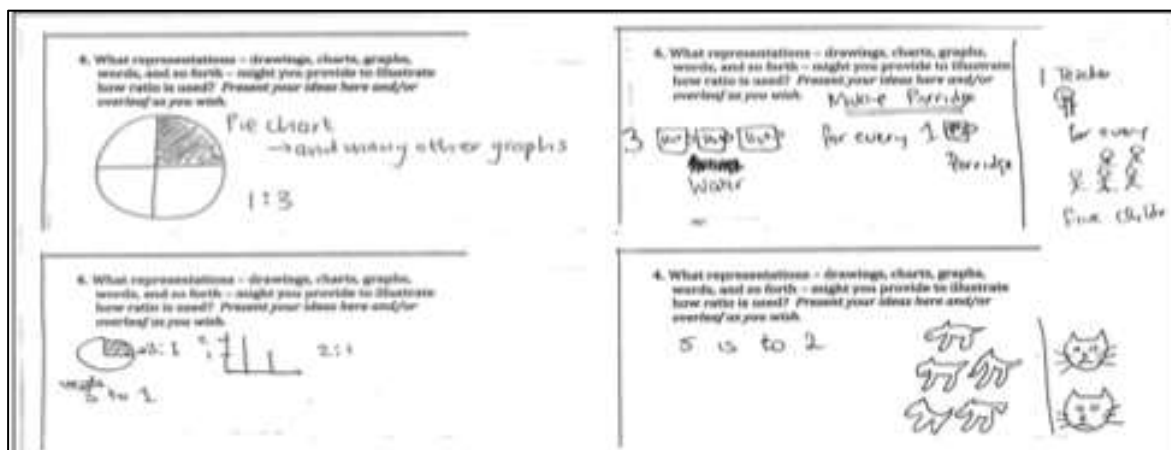


Figure 7. Pictorial representations indicating two variables: charts and graphs, and drawings

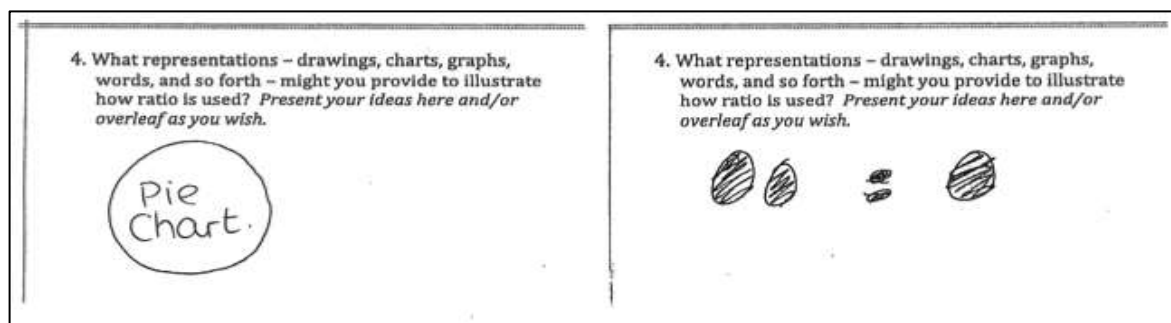


Figure 8. Pictorial representations not clearly indicating two variables: chart and drawing

### Discussion

The data provide answers to research question (a) with regard to the meanings and representation offered by the PDPT 2014 group. They support the contention that many of the students do not have readily available content knowledge of ratio - at least, for display in the situation in which data were collected. In particular, in their responses to item 1, around a quarter of the PDPT cohort did not offer a “meaning” for ratio deemed to indicate a two-variable understanding of the concept. With regard to “representations”, for both items 3 and 4 only about two-fifths of the students provided multiple examples, with the use of multiple types of representation being correspondingly less frequent. For item 4, only about two-fifths of the group offered a clear two-variable representation; only about the same number offered some kind of pictorial representation, despite the fact that the wording was intended to encourage them to do so; and just under a quarter did not respond to the item. According to the conjecture advanced in the original Ratio Project paper (Berenson et al. 2013), this shows that the students did not display the good “relational understanding” that is important for teaching - a partial answer to research question (b).

Returning to research question (a): predictable differences were found between the “specialists” considered previously and the PDPT 2014 group. The latter were less inclined than previous Irish groups - especially those from 2013, who were confronted with very similar forms of the items - to respond at all, to use the language of comparison or relationship explicitly with regard to meaning, and to provide multiple representations and multiple examples; overall, they seemed less familiar with technical terminology and notation. This reflects the fact that for prospective primary teachers, mathematics is just one compulsory subject among many. Moreover,

the 2014 students (taking a postgraduate diploma) are particularly vulnerable for many reasons: they may not have studied or used much mathematics since leaving school; the mathematics requirement for admission to PDPT courses is low; and there are fewer hours devoted to Mathematics and Mathematics Methodology than in bachelor’s courses for primary teaching.

However, in discussion, participating primary teacher educators indicated that the findings were in accordance with their perception that many of their students (undergraduates as well as graduates) had only rote knowledge of the ratio concept, and could not explain or represent their knowledge in one or more ways to indicate understanding. Addressing research questions (b) and (c), the teacher educators agreed that further use of the instrument as a learning tool in teacher education classes, as suggested in the Irish study in 2013 (Oldham and Ni Shuilleabhain 2014), would help to address problems students encounter in developing understanding of the concept of ratio and proportional reasoning skills. For example, “think, pair, share” strategies might allow students to reflect on, discuss and develop their understanding in a non-threatening environment. Such work is now being undertaken.

### Conclusions and implications for teacher education

The Ratio Project has produced insights into the understanding of ratio by prospective teachers in several countries, and more contributions are planned. The findings are illuminating, not only within the individual countries, but also more generally. As stated in the original paper (Berenson et al. 2013, 78–79), “we examine our data for similarities across countries and universities. This leads to greater understanding and a base of knowledge of mathematics and science teacher education within the international education community....” Thus, for example, analysis of the rather similar results of the Portuguese study in 2013 (Fernandes and Leite, forthcoming) and the current Irish study, both involving prospective primary teachers, may help to reveal conceptual problems that emerge independently of curricular and pedagogical traditions, while also pointing to approaches reflected in responses from one country that may be helpful in another.

As indicated earlier, neither ratio and proportion, nor representations, figure strongly in mathematics curricula in Ireland. As a result the topics have probably not been given enough attention in teacher education courses (Oldham and Ni Shuilleabhain 2014). The current study has pointed to the need for more emphasis in these areas. Moreover, while the Ratio Project has focused on relational understanding, there may also be a need to address instrumental understanding (procedural fluency). A more detailed knowledge audit could help to throw further light on prospective primary teachers’ knowledge for teaching, and so could indicate how the issues might be addressed in pre-service teacher education courses. The time may also have come to address the issues in professional development courses for practising primary teachers.

### References

- Banker, T. 2012. “Student thinking about proportionality.” *Mathematics Teaching in the Middle School* 17 (6): 379-381.
- Berenson, S., E. Oldham, E. Price, and L. Leite. 2013. “Investigating representations of ratio among prospective mathematics and science teachers: an international study.” In *Association for Teacher Education in Europe 37th Annual Conference, Eskisehir, Turkey*, edited by E. Agaoglu, C. Terzi, C. Kavrayici, D. Aydug, and B. Himmetoglu, 78-92. Brussels: ATEE aisbl.
- Chick, H. 2010. “Aspects of teachers’ knowledge for helping students learn about ratio.” In *Shaping the Future of Mathematics Education: Proceedings of the 33rd Annual Conference of the Mathematics Education Research Group of Australasia*, edited by L. Sparrow, B. Kissane, and C. Hurst, 145-152. Fremantle: MERGA.
- Clark, M., S. Berenson, and L. Cavey. 2003. “A comparison of ratios and fractions and their roles as tools in proportional reasoning.” *Journal of Mathematical Behavior* 22: 29-317.

- Cohen, J. 2013. “Strip diagrams: illuminating proportions.” *Mathematics Teaching in the Middle School* 18 (9): 536-542.
- Ellis, A. 2013. “Teaching ratio and proportion in the middle grades.” *National Council of Teachers of Mathematics*. <http://www.nctm.org/news/content.aspx?id=35822>
- Fernandes, J., and L. Leite. 2015. “Compreensão do conceito de razão por futuros educadores e professores dos primeiros anos de escolaridade.” *BOLEMA* 29 (51): 241-262.
- Gningue, S. 2014. “Students working within and between representations: an application of dienes’s variability principles.” *For the Learning of Mathematics* 26 (2): 41-47.
- Hart, K. 1981. *Children’s understanding of mathematics 11-16*. London: John Murray.
- Hart, K. 1984. *Ratio: children’s strategies and errors*. Slough: NFER-Nelson
- Hart, K, D. Johnson, M. Brown, L. Dickson, and R. Clarkson. 1989. *Children’s mathematical frameworks 8-13: a study of classroom teaching*. Slough: NFER-Nelson.
- Hunter, A. E., S.B. Bush, and K. Karp. 2014. “Systematic interventions for teaching ratios.” *Mathematics Teaching in the Middle School* 19 (6): 360–367.
- Kaput, J. 1987. “Towards a theory of symbol use in mathematics.” In *Problems of representation in the teaching and learning of mathematics*, edited by C. Janvier, 159-195. London: Lawrence Erlbaum.
- Lamon, S. 1993. “Ratio and proportion: connecting content and children’s thinking.” *Journal for Research in Mathematics Education* 24 (1): 41-61.
- Lamon, S. 2007. “Rational numbers and proportional reasoning: towards a framework for research.” In *Second handbook of research on mathematics teaching and learning*, edited by F. Lester, 629-667. Charlotte, NC: Information Age.
- Lesh, R., M. Behr, and T. Post. 1987. “Rational number relations and proportions.” In *Problems of representation in the teaching and learning of mathematics*, edited by C. Janvier, 41-58. London: Lawrence Erlbaum.
- Lesh, R., T. Post, and M. Behr. 1987. “Representations and translations among representations in mathematics learning and problem solving.” In *Problems of representation in the teaching and learning of mathematics*, edited by C. Janvier, 33-40. London: Lawrence Erlbaum.
- Lewis, K. 2014. “Difference not deficit: reconceptualizing mathematical learning disabilities.” *Journal for Research in Mathematics Education* 45 (3): 351-396.
- Livy, S., and Vale, C. 2011. “First year pre-service teachers’ mathematical content knowledge: methods of solution for a ratio question.” *Mathematics Teacher Education and Development* 13 (2): 22-43.
- NCCA [National Council for Curriculum and assessment]. 1999. *Primary school curriculum: mathematics*. Dublin: The Stationery Office.
- Oldham, E. and A. Ni Shuilleabhain. 2014. “Investigating representations of ratio among prospective mathematics teachers: a study of student-teachers and students of mathematics in an Irish university.” In *Proceedings of the ATEE 38<sup>th</sup> Annual Conference, Halden, Norway*, edited by E. Arntzen, 298-321. Brussels: ATEE.
- Pape, S., and M. Tchoshanov. 2001. “The role of representation(s) in developing mathematical understanding.” *Theory Into Practice* 40 (2): 118-127.
- Price, E. 2014. “Teachers’ use of ratio.” In *Proceedings of the ATEE 38<sup>th</sup> Annual Conference, Halden, Norway*, edited by E. Arntzen, 322-340. Brussels: ATEE.
- Ruchti, W., and C. Bennett. 2013. “Developing reasoning through pictorial representations.” *Mathematics Teaching in the Middle School* 19 (1): 30–36.
- Skemp, R. 1976. “Relational understanding and instrumental understanding.” *Mathematics Teaching* 77: 20–26.

[Back to contents](#)





## **Collaborative action research as teacher education strategy for conflict mediation in an early childhood context**

*Catarina Sobral & Ana Paula Caetano*

*University of Lisbon, Portugal*

camisaso@gmail.com & apcaetano@ie.ul.pt

### **Abstract**

This paper reports on a PhD study in Education, which focuses on teacher education concerning conflict mediation in early childhood education. The study took place in a social care institution in Lisbon involving all (eleven) kindergarten teachers, four assigned to the day care and seven to the preschool and lasted fifteen months. The main research question was: How is collaborative action research understood as continuing education strategy, contributing to the development of knowledge and practices of educators under the mediation of conflicts? The study contributed to the development of reflective practices, towards a greater awareness of the conduct of educators as mediators in conflicts between children. A deepening of the collaborative culture was also observed through the establishment of a closer relationship between teachers of day care and preschool; the involvement of teacher’s assistants and parents in the educational process; and the creation of pedagogical teams in the school.

**Keywords:** professional development; collaboration; participatory action-research; conflict mediation; reflexivity

### **Context of the research**

This paper presents a research study focused on a process of in-service teacher education, using an action research strategy. It was conducted in a school in Lisbon and involved all its kindergarten teachers. The initial question was: How collaborative action research constitutes itself as continuing teacher education strategy, contributing to the development of knowledge and practices of kindergarten teachers about the conflict mediation?

### **Research aims**

The main goals were: i) To understand and build knowledge about how the collaborative action research is established as a training strategy for the participating educators in the field of conflict management; ii) To promote an investigative attitude by reflective analysis of their practice; iii) To comprehend the repercussions of the teacher education process in their concepts and practices. This paper is structured in order to present and discuss some findings and repercussions of the teacher education process, intertwining teachers’ voice and researchers’ interpretation, framed by a theoretical background that is briefly presented. Changes on conflict mediation practices, on teachers’ professional knowledge and on collaborative school structures and dynamics are outlined.

### **Theoretical Framework**

In a traditional perspective conflict is seen as something bad, a negative event that has to disappear almost immediately (Jares 2002). However conflict may be seen as a possibility to comprehend each other’s point of view, in an interpretative perspective (Jares 2002), or as an opportunity to transform the relationships, the actors and their contexts as well, in a critical perspective (Jares 2002).

Conflict is a daily situation in early childhood education since children have difficulties in managing them, given their incipient development of social competence. So, adults should pay particular attention to learning and social development from an early age (Sastre and Moreno

2002). Therefore, kindergarten teachers should prevent conflict situations and, more importantly, give support to children guiding them through mediation processes and, progressively, leading them to be more autonomous when managing their own conflicts (Sobral and Caetano 2009).

Conflict mediation is an active process of conflict management in which litigants search for an impartial third person to support them - the mediator. This, in turn, creates a confident environment, provides guidance for the re-establishment of communication and assists the pursuit of a joint solution for both parties (Boqué 2008; Guillaume-Hofnung 2000; Jares 2002; Six 1995; Torrego 2003; Vasconcelos-Sousa 2002; and others).

In order to understand the role of kindergarten teachers in conflict situations and to develop conflict mediation processes in those contexts further research is needed. Collaborative action research seems to be a powerful way which combines knowledge construction and change with a potential role in the development of collaborative school cultures (Almeida 2011; Cadório 2011; Santos 2013). A collaborative school culture may be seen as a solution to face requirements and problems of today's society, since it emphasizes the development of both teachers and school (Hargreaves 1998). The school leadership is a main factor that contributes to the learning and professional development of teachers, establishing limits and/or opportunities for teachers' work and educational change (Day 2001; Fullan and Hargreaves 2001; Hargreaves 1998). There are different forms of leadership and diverse types of collaborative relationships. For this work it is defined a facilitating leadership form (Day 2001), which: (i) gives support; (ii) encourages and listens to each individual; (iii) promotes innovation, through four types of collaborative relationships: look for ideas and storytelling; help and support; sharing; and joint work (Little 1990). These are conditions that generate active and more involved members in the school community and, therefore, with a higher sense of commitment both with their work and with their lives.

A strong collaborative relationship implies reflective practices, leading to new understandings and an enhancement of teachers' practices (Fullan and Hargreaves 2001), that may surpass an impulsive and routine behaviour in order to gain a more deliberated and intentional performance (Day 2004). Reflective practices include not only joint plan, professional dialogue, mutual observation but also a critical reflection upon the purposes and the contexts, which raise an inquirer reflection.

Professional knowledge requires interrelation between practice and reflection, from which emerge reliable knowledge with specific contents, such as:

- “-content knowledge;
  - general pedagogical knowledge, with special references to those broad principles and strategies of classroom management and organization that appear to transcend subject matter;
  - curriculum knowledge, with particular grasp of the materials and programs that serve as “tools of the trade” for teachers;
  - pedagogical content knowledge, that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding;
  - knowledge of learners and their characteristics;
  - knowledge of educational contexts, ranging from workings of the group or classroom, the governance and financing of schools districts, to the character of communities and cultures; and
  - knowledge of educational ends, purposes, and values, and philosophical and historical grounds.”
- (Shulman 1987, 8).

Hence, learning how to teach is a process that articulates theory and practice allied to a school context. Teachers know about themselves, pupils, contents and context, not only through theory but essentially through the contact with practical situations subject to reflection, generating useful practical knowledge. Therefore, continuing teacher education is based on an organized and systematic process that includes personal and professional development activities centered on their needs and interests, increasing change potential of teachers and schools (Day 2001, 2004; Estrela and Estrela 2006; Marcelo 1999).

In labor context, teachers have the opportunity to achieve professional development through numerous ways, especially either through: teacher education processes; mutual support based on observation and reflection; and action research, being an active teacher-researcher in a

collaborative context (Kemmis 2009; Sparks and Loucks-Horsley 1990, amongst others). These models may be considered to relate with some of the metaphors announced by Sachs (2009), namely: revitalization - focus on rethink and review practices concerning pupils’ needs, through reflection on and about the action; and re-imagination - values a collaborative environment, sharing of experiences, knowledge and resources, and also develops a critical and innovative perspective of the curriculum.

Teachers’ professional development is a holistic process encompassing all learning experiences - formal, non-formal, individual or collective, inside or outside the school - and contributes to the quality of teachers’ performance and in which they should be involved throughout their careers (Day 2001, 2004; Estrela and Estrela 2006; Flores, Veiga Simão, Rajala and Tornberg 2009; Gonçalves 2009; Marcelo 1999, 2009; Oliveira-Formosinho 2002, 2009; Ponte 1994; amongst others).

### **Research methodology**

The study followed a qualitative methodology, within the interpretive and critical research paradigm. The research method selected was a case study in action research (Stenhouse 1988) within a collaborative setting. Stake (1994, 237) states that “a case study is both the process of learning about the case and the product of our learning”. Action research promotes in the educators a stance of questioning and reflection with a critical regard to their teaching and contexts, on a daily basis that allows new understandings about their own and their students’ behaviours in order to improve or enhance it. By doing so they are empowered to: (i) make informed decisions about what to change and what not to change; (ii) link prior knowledge to new information; (iii) learn from experience (even failures); and (iv) ask questions and systematically find answers (Mills 2000). It is a process that develops in a spiral, made by cycles of interrelated and complementary phases: plan, action, observation and reflection (Kemmis and McTaggart 2000).

The empirical study was conducted in a school in Lisbon, involving all (eleven) kindergarten teachers - four assigned to day care (day care educators - DE) and seven to preschool (preschool educators - PE) - and lasted fifteen months. This was a dynamic, interactive and flexible process and several data collection instruments and techniques were used, among which: questionnaire, observations (self and pairs), interviews (focus group - FGI and follow up - FUI), field notes (summaries of the sessions, of readings, sessions’ synthesis) and final reflections (FR). The data analysis procedures followed the content analysis of Bardin (2000), statistical analysis (with the Statistical Package for Social Sciences program) and triangulation. In this paper some quotes collected from teachers’ interviews and final reflections are presented, in order to illustrate their interpretations and some of the findings.

The investigation with teachers was developed in two moments or cycles of action research, based on a critical reflection about day care and preschool educators’ performances when facing conflict situation among peers. The first phase (from March to June 2009) consisted of a teacher education study circle modality - meaning a teacher education methodology whose main aims is: to involve in the process of questioning for changing professional practice; and to increase collegiality between teachers - with the focus on subject of conflict mediation. And the second phase (from October 2009 to July 2010) consisted of a set of informal sessions (IS), in which other stakeholders were involved and educators did individual and collective projects concerning conflict mediation in their classrooms. It started with the recognition of kindergarten teacher’s needs, expectations, interests and raising questions concerning daily children conflicts. An observation grid was constructed together, in which educators registered the incident, with a description and a brief reflection. They undertook self-observations and went to each other’s classrooms to observe their peers. The observations were analysed in group, the problems were discussed, gathering suggestions given by the literature and new strategies to implement in action.

At the end of the first phase a joint synthesis of the process was written, outlining what was an emergent need to overcome next year, namely to organize training sessions with teachers’ assistants and a thematic meeting with parents.

Throughout the second phase teachers’ assistants were involved in a training session that was previously planned (by kindergarten teachers and the researcher) and it focused mainly on communication through the conflict mediation process. This was also a way to stimulate more dialogue between teachers’ assistants and kindergarten teachers about the way they usually acted and how they should act in conflict situations among children, so there would be consistency in the actions of all adults in the classroom and therefore, children’s sense of security would be heightened.

At the parents’ thematic meeting, from day care to preschool, they had the opportunity to reflect on the topic. Parents were very interested in the issue and had time to present their concerns in small groups and together (parents and kindergarten teachers) they tried to coordinate ideas and suggestions in order to work better as a team. Furthermore, kindergarten teachers started by addressing their major problems at the moment, with observations, text reading and group discussions. In day care two projects were realized: biting and treasure basket (Goldschmied and Jackson 2004); and in preschool two projects were also realized: tattletale and feelings box. The main researcher, one of the authors of this paper, participated also as teacher educator and critical friend, organizing the process. In order to know the real change effects, the follow up interviews and observations were done, by the main researcher, 16 months after the end of the teacher education process.

## Findings

### *Teacher education process: deepening reflective and dialogic practices of conflict mediation*

The teacher education was based on a systematic, organized and collaborative process around activities planned jointly, in the school context, in order to better meet the educators’ needs, leading to changes at the level of knowledge, understanding, skills, dispositions and beliefs about conflict mediation. It intended to contribute to the professional development of the educators, focusing on reflective practices which encompassed individual and peer observations, discussion, collective analysis and reflection that by turn allowed a different consciousness of what happens in the educators’ classrooms, a greater awareness of their own attitudes and values and stimulates innovation:

“They were helpful [peer observations] to realize that the same issues occur in the different classrooms... we see colleagues’ strategies in solving problems... and that allowed a different awareness of what often happens in our own classroom.” (Renata, PE1, FUI: 18).

“It was also nice to be able to observe and confirm how colleagues manage conflicts ... it helped to reflect on our attitudes and reformulate them when necessary.” (Nini, DE3, FUI: 6).

Also, most of the educators argue that their previous actuation regarding conflict situations used to be spontaneous, intuitive and even routine, but, through reflection, their actions became closer to mediation practices, particularly based on observation, dialogue and active listening:

“This process made us reflect upon our practice. Maybe we were acting according to our intuition and now we reflect a little before acting. This is a more thoughtful actuation.” (Camila, DE1, FGI: 23).

“Now I have a more cautious posture, instead of intervening immediately, first I observe and wait to see if they can manage the conflict by themselves.” (Rita, DE2, FUI: 3).

“Many times, due to our tiredness, the reaction is taking the children from there and do not listen either of them. (...) Where there is a conflict there are two different parts and they have to be heard since it opens horizons. This process took me to hear everyone until the end and to dialogue, a further deeper dialogue.” (Fáti, PE2, FUI: 2).

Therefore, educators assume that most of the time they acted accordingly to their practical knowledge without reflection and that throughout the teacher education process they were able to mobilize, in a more conscious way, their intuitive and reflective thought (Caetano 2001). Hence, most educators reach new understandings about themselves, children and context, and even started to act differently improving their practices. Nonetheless, some others stated they had not changed

their thoughts and actions about conflict management, but although they continue to argue that they act exactly the same way as before, they have acknowledged that it was important to reflect and read about those themes. All members of the group understood the teacher education process as an opportunity to re-think and review their own practices through reflection, a “revitalization”, and also a “re-imagination” (Sachs 2009), generating a new collaborative dynamic, with all educators working together, and the usage of new strategies either in day care or in preschool.

### ***Construction of professional knowledge: integrating theory and practice***

Professional knowledge articulates theory and practice and also enables understanding of the school context. By a reflective process that encompasses both reading literature and through the contact with practical situations, teachers generate useful practical knowledge. So, conflict situations have gained a deeper meaning, starting to be seen as an opportunity to enrich the group and to make the necessary changes in behaviour and attitudes of all, in order to live in society - interpretative and critical perspectives (Jares 2002) instead of facing conflict as a negative event - traditional perspective (Jares 2002), since:

“Conflict and its resolution invariably involves the values, beliefs, ideas of each one and is always an opportunity to address these aspects. Different views may enrich the group life” (Joana, PE4, FR: 1).

“Honestly, I saw conflict in a different way! I thought conflict was whenever a child hit another. And now I see it isn’t” (Camila, DE1, FGI: 36).

“I am more available to try to understand what made arise any conflict, call the parties and put them to talk with each other. Before, if I saw a slapping I would immediately call them and say: “You two sit down, it is over” and nowadays is like: “Explain yourself”, trying to deconstruct the situations with them.” (Renata, PE1 FGI: 47-48).

“And that was also a big challenge, not only in the activities with the children, but also with other adults in school. So all this I think it was important because it shifted a bit with attitudes, with values, with postures, with relationships” (Nini, DE3, FUI: 7).

As participants, kindergarten teachers acquired knowledge derived mainly from sharing experiences, observations (self and peer) and reflections (individual and collective) about their own practices, in dialogues where readings on conflict and conflict mediation were combined:

“The observations’ registration and then the reflection itself, where I would say I did or did not do this or that... makes you think and question about the best way to proceed, otherwise conflicts pass (are just an ordinary moment in our daily routine)” (Renata, PE1, FGI: 47).

“I think it made me, somehow, more attentive” (Joana, PE4, FGI: 46).

“I found this teacher education process very good in terms of group dynamic. In fact, is a theme that is very interesting and I feel that I have another vision about conflict situations” (Maria, PE5, IS: 10);

“And so, it was not only the theoretical part but the practical part of doing peer observations and to hear various experiences of other classrooms” (Fáti, PE2, FUI: 12).

“I really enjoyed knowing how my colleagues usually perform and I tried to experiment as well.” (Anita, PE3, FUI: 13).

Kindergarten teachers assume changes in their knowledge, namely in the following categories according to the typology of Shulman (1987): general pedagogical knowledge; knowledge of learners and their characteristics; and knowledge of educational ends, purposes and values. In relation to the first one, some of the strategies to manage conflict situations among children were new and some others have gained a different groundwork, improving their listening and emphatic skills for example. The second content was highlighted since from the first to the second phase there was an increase in the number of comments related to children’s characteristics, personality, learning difficulties, amongst others, in the reflections of the educators’ observations that could indicate a greater sensibility concerning learners, and the need to adapt strategies individually. Finally, there was a reflection on values underlying educators’ action, leading to a greater awareness and commitment with those values (such as justice, respect, autonomy, and others). Therefore, knowledge was constructed on and by practice, relying on experience, theoretical knowledge and reflection.

### ***School context and dynamics: deepening of a collaborative culture***

The empirical study was conducted in a school with a collaborative culture, and to kindergarten teachers the main factor that sustains collaborative dynamic in school is its leadership. From their statements it's possible to identify some of the strategies used by a “facilitating leadership” (Day 2001), such as: creating conditions and generate learning opportunities, motivating and offering continuing training (either with internal or external persons), providing time, material and financial resources, and also helping with personal and professional troubleshooting - “giving support”; valuing the participation of all educational agents, giving them the opportunity to have an active voice, generating a pleasant environment - “encouraging and listening to each individual”; and by accepting and/or promoting new and challenging ideas - “innovation”. Here are some of the comments:

“The board makes sure everyone is listened and has given their own opinion” (Nini, DE3, FGI: 20).

“We have training sessions along the school year, where all staff of the institution participates. Lately it has been promoted by persons from inside” (Renata, PE, FGI: 3).

“I recall once we received financial support to go to training: we gave half of the money and the other half was given by the board” (Lili, DE4, FGI: 7).

Teachers also addressed the issues that limited the establishment of a collaborative environment in the school, such as: time, both teachers' assistants and parents' performances concerning conflict between children. The schedule availability is usually the greater difficulty to work collaboratively, but everyone made a huge effort. During the teacher education process the school's collaborative culture developed. The meetings of our group allowed gathering, not only kindergarten teachers from day care or from preschool, but all kindergarten teachers, working together towards the improvement of practices concerning conflict situations among children. Therefore there was an overcoming of the isolation between educators, joining day care and preschool as well:

“We started talking about conflict and we did distinctions between the most frequent conflicts in daycare and in preschool. We also had distinguished between what in daycare was considered normal, as bites, but in preschool are already unadjusted socially. And we can compare different contexts and different actuations... and so sharing is a good thing.”(Rita, EC2, FUI: 7-8).

Some were able to surpass their personal problems of insecurity, feeling more confident in sharing their views:

“Sometimes we have difficulty in externalizing or speak openly because we think it is going to diminish us as persons or as professionals; we try to hide, because we do not manage so well as... or we have difficulty managing those behaviours, either of children or even ours” (Camila, EC1, FUI: 12).

Analysing the processes in the light of the typology of Little (1990), the interactions established among educators were based on sharing, storytelling and looking for ideas, help and support, and work together, as the statements refer:

“It's always good to share these moments where we share a little of what goes on inside our classroom, which sometimes goes unnoticed for other people” (EJ4, EFU: 4).

“I think it is good we read these new methods that will help us in our practice and even at home, in our day-to-day.” (Rita, EC2, FUI: 4).

“As a result of this exchange of experiences led us to find different ways of managing conflict, finding other solutions” (Margarida, EJ8, FUI: 14).

And it was a great opportunity for kindergarten teachers to know their own colleagues better at a more personal level:

“It's also that moment that all of us are gathered and we talked with each other and got to know better the persons” (Nini, EC3, FUI: 17).

When the researcher returned to the field to perform follow up interviews and observations (16 months later), she found an innovation at the school, a new collaborative dynamic, teachers organized in pedagogical teams:

“... is a dynamic that allows us to talk about things we did not talk before, in particular, this kind of

situations, behaviours of children that sometimes we cannot solve ... and this type of meetings, we could often fill gaps that existed ... discussed a lot that is happening, especially this kind of issues, problems that exist in the room” (Anita, EJ3, FUI: 13).

Kindergarten teachers gather every 15 days or whenever they feel it is needed, particularly to share and support each other’s practices not only concerning their own classrooms but also the general school activities. They now have a leader of each team (one colleague) who is responsible to talk with the board about any subject they need. The main goal is to continue the work started between educators and researcher and consolidate even more the collaboration in school.

### **Conclusions and implications for teacher education**

The teacher education process contributed to the development of the kindergarten teachers’ conflict conceptions and action as mediators. Educators assumed a different understanding of conflict, since previously conflict was mostly seen as something that brings disorder to classroom and school environment but through the teacher education process, conflict started to be seen as a natural and healthy event, in which the disputants had different points of view facing the same reality, and even as a challenge, a mean to promote change, for example towards self-regulation of the classroom’s activities and planning. They have a better understanding of the importance of conflict and the need to face it as something positive, instead of a negative event, and as a learning opportunity.

Owning the reflective process of their particular conflict situations and of their own practice, practitioners started to pay more attention to performance and to give more attention to the observation of the situation before taking any action. At the beginning of the teacher education process educators’ actuation was more spontaneous and intuitive and during their action research process they realized that reflective practice allowed them to understand that there are ways to release them from a previous routine behaviour and achieve a more deliberated and intentional action. Throughout a process of reflection in/on the action educators stated that their action became more thoughtful, they began to observe and question themselves more often, before and during their performance. They acknowledged that there was an effort to become more empathic, affective and communicative towards children in conflict situations. In this way they assume an “unitary praxis”, where there is a coherence between what they say, what they do and how they relate with the others (Kemmis 2009). This process was also a lever to create pedagogical teams which rely on a collaborative work between educators as a training practice in the workplace.

Returning to the general question of the research and reflecting on its implications for teacher education, the conclusion of the present research is that action research as a strategy for in-service teacher education is helpful in numerous ways, since it allows both researcher and practitioners to work together, sharing, questioning and problematizing their contexts and practice and by those means contributing to the professional development of all actors involved.

### **Acknowledgements**

This work was supported by the Foundation for Science and Technology (FCT) under Grant reference SFRH/BD/48488/2008.

### **References**

- Almeida, M. 2011. “Desafios ao desenvolvimento profissional.” PhD diss., University of Lisbon.
- Bardin, L. 2000. *Análise de conteúdo*. Lisbon: Edições 70.
- Cadório, M. 2011. “A investigação-acção em contexto colaborativo: mudanças nas concepções e práticas dos professores.” PhD diss., University of Lisbon.
- Day, C. 2001. *Desenvolvimento profissional de professores*. OPorto: Porto Editora.
- Day, C. 2004. *A paixão pelo ensino*. OPorto: Porto Editora.
- DEB. 1997. *Orientações curriculares para a educação pré-escolar*. Lisbon: Ministério da



Educação.

Delors, J., et al. 1998. *Educação: um tesouro a descobrir*. Lisbon: Edições ASA.

Estrela, A., and M. Estrela. 2006. “A formação contínua de professores numa encruzilhada.” In *Formação de professores de línguas estrangeiras: reflexões, estudos e experiências*, edited by R. Bizarro and F. Braga, 73-79. OPorto: Porto Editora.

Fullan, M., and A.Hargreaves. 2001. *Por que é que vale a pena lutar? O trabalho de equipa na escola*. OPorto: Porto Editora.

Flores, M., A. Veiga Simão, R. Rajala, and A. Tornberg. 2009. *Aprendizagem e desenvolvimento profissional de professores: contextos e perspectivas*. Mangualde: Edições Pedagogo.

Goldschmied, E., and S. Jackson. 2004. *Educação de 0 a 3 anos: o atendimento em creche*. Lisbon: Artmed.

Gonçalves, J. 2009. “Desenvolvimento profissional e carreira docente - fases da carreira, currículo e supervisão.” *Sísifo* 8: 23-36.

Hargreaves, A. 1998. *Os professores em tempos de mudança*. Alfragide: McGrawHill.

Jares, X. 2002. *Educação e conflito - guia de educação para a convivência*. OPorto: Edições ASA.

Kemmis, S. 2009. “Action research as practice-based practice.” *Education Action Research* 17 (3): 463-473.

Kemmis, S., and R. McTaggart. 2000. “Participatory action research.” In *Handbook of qualitative research*, edited by N. Denzin and Y. Lincoln, 567-605. Thousand Oaks, CA: Sage.

Ladd, G., J. Price, and C. Hart. 1988. “Predicting preschoolers’ peer status from their playground behaviors.” *Child Development* 59 (4): 986-992.

Little, J. 1990. “The persistence of privacy: autonomy and initiative in teachers’ professional relations.” *Teachers College Record* 91 (4): 509-536.

Marcelo, C. 2009. “Desenvolvimento profissional docente: passado e futuro.” *Sísifo* 8: 7-22.

Marcelo, C. 1999. *Formação de professores - para uma mudança educativa*. OPorto: Porto Editora.

Mills, G. 2000. *Action research: a guide for teacher researcher*. New Jersey: Meerill.

Oliveira-Formosinho, J. 1996, ed. *Educação pré-escolar - a construção social da moralidade*. Lisboa: Texto Editora, LDA.

Oliveira-Formosinho, J. 2002. “O desenvolvimento profissional das educadoras de infância.” In *Formação em contexto: uma estratégia de integração*, edited by J. Oliveira-Formosinho and T. Kishimoto, 41-88. São Paulo: Pioneira Thomson Learning.

Sandy, S., and K. Cochran. 2000. “The development of conflict resolution skills in children.” In *The handbook of conflict resolution: theory and practice*, edited by M.Deutsch and P. Coleman, 316-341. San Francisco: Jossey-Bass Publishers.

Santos, M. 2013. “Formação contínua de professores em contextos laborais colaborativos - seus reflexos nas concepções e práticas profissionais.” PhD diss., University of Lisbon.

Sastre, G., and M. Moreno. 2002. *Resolução de conflitos e aprendizagem emocional*. São Paulo: Moderna.

Shulman, L. 1987. “Knowledge and teaching.” *Harvard Educational Review* 57, 1: 1-22.

Sobral, C., and A. Caetano. 2009. “Gestão de conflitos.” In *Tutoria e mediação em educação*, edited by A.Veiga Simão, A.Caetano, and I. Freire, 149-158. Lisboa: Educa.

Sparks, D., and S. Loucks-Horsley. 1990. “Models of staff development.” In *Handbook of research on teacher education*, edited by W. Houston. 234-250. New York: Mcmillan Publishing Company.

Stake, R. 1994. “Case studies.” In *Handbook of qualitative research*, edited by N. Denzin and Y. Lincoln. 236-247. London: Sage Publications.

[Back to contents](#)

## The role of personal development in German early childhood training programmes

*Janne Fengler, Alexander Röhler & Stephanie Conein*

*Alanus University of Arts and Social Sciences, Germany*

janne.fengler@alanus.edu, alexander.roehler@alanus.edu & stephanie.conein@alanus.edu

### Abstract

Although the importance of personal development for early childhood teachers is often emphasized by experts, there are hardly any empirical findings concerning how to incorporate personal development into programs. The current research project focuses on the personal development through vocational education of early childhood teachers. The completed first stage examined existing opportunities in training programs along with their aims and justifications, using document analysis and qualitative expert interviews. The second part will explore possible effects of personal development opportunities by using narrative interviews and guideline oriented expert-interviews.

**Keywords:** personal development; early childhood teachers; vocational education.

### Context of research

Academic as well as non-academic degrees in early childhood education strive to provide teachers with relevant skills they require to support children’s learning and development. Beyond that though, professionals working with young children need to possess certain qualities with respect to their own personality.

In the scientific discussion in Germany, personal development has long been regarded as a key factor in developing the occupational skills of early childhood professionals (see Ebert 1988; Greine 2004; Krenz 2008; Neuss and Zeiss 2013). Furthermore, due to the alignment of national qualifications in accordance with the European Qualifications Framework (EQF), the nature of the training that early childhood professionals undergo in Germany has changed over the last decade. This applies to both universities, which now also offer study programs for future educational specialists, and college-based qualifications.

For academic and non-academic areas, the majority of relevant qualification frameworks, which were incorporated gradually in recent years, stress the importance of personal development. Existing research regarding demands is largely theoretical, while empirical research is rudimentary. There is virtually no research into how to promote the personal development of early childhood professionals during their qualification.

### Research questions

From these general reflections, two specific research questions were drawn that guided data collection and analysis:

(1) Which role does personal development play in academic and non-academic qualification programs of early childhood professionals and what didactical methods are implemented?

Here the aim was to investigate the qualification offers made by several programs of early childhood education in Germany and to look for their contents with respect to personality development. This first part of the research project was finished in 2014.

(2) To which extent and how do institutions meet their ambition to develop their students’ personalities from the perspective of the central players in academic and non-academic qualification programs?

The second part of the project, carried out in 2014 and 2015, explores the possible effects and outcomes of programs for early childhood education in respect to personality development.

Therefore, university lecturers/college teachers, students, and alumni were interviewed.

## **Theoretical framework**

### ***The concept of personal development***

Former research has attempted to find relations between the qualification of teachers and e.g. classroom quality or children’s academic gains in pre-kindergarten (Darling-Hammond et al. 2005; Early et al. 2006; Early et al. 2007). Such studies tend to focus on variables accessible contributing to a paradigm in terms of input and outcome; results are oftentimes discussed referring to setting and attaining structural standards and specific measures to track quality.

Our research questions also touch on the issue of the impact that qualification programs can have on the future professional and his or her means to interpret and shape his or her professional role. The focus on the development of personality rather than the development of a specific skill set seems to be more difficult to grasp though.

“Personal development refers to the process by which children are shaped and formed by their social and physical environment, and their genetic makeup, until they emerge as unique adults having distinctive personalities.” (Potkay and Allen 1986, 11).

One common way to describe the development of human beings in psychology and educational sciences is focusing on the age group of children and adolescents. Other ways to look at personality change over the lifespan are to focus (a) on unexpected and unwanted life events, such as divorce or unemployment, or (b) on common life themes running through most people’s lives such as forming close relationships to others, building up a professional career. Theorists such as Havighurst or Erikson worked on these themes and accordingly differentiated major stages of personal development. However, as Potkay and Allen (1986) also point out, one assumption implicit in the phrase “personal development” is that the way a child is reared determines, to a great extent, what traits he or she will possess. Even casual observation indicates that some people are more consistent than others in terms of change and that other children, adolescents and adults vary enormously, independently of respective age-related stages. Furthermore, research points toward two phenomena. Firstly, learning and development are processes that take place across the lifespan. Secondly, we can assume personality-change to partly be process and partly the result of a proactive and co-constructive act, whereby environmental factors can shape also adults’ personalities in both positive and negative ways, and vice versa.

Generally speaking, an individual’s personal development and his or her personality development grooms this person and helps her to have a style of her own both in her private and in her professional life.

Social competencies as a result of successful personal development for example are perceived as being crucial for educational professionals: “Since teachers spend several hours a day in interactions with other people, it seems plausible to assume that their social competencies are a vital foundation for their professional success” (Kanning, Böttcher, and Herrmann 2012, 140). Referring to pre-service teachers, Decker and Rimm-Kaufmann (2008) underline the various requirements of the working field. The authors state: “People are highly variable in the degree to which they can meet these multi-level demands. Personality characteristics are likely to be important predictors of this ability” (Decker and Rimm-Kaufmann 2008, 47). In the context of early childhood education, personal development also includes the foundation for setting an example and being a role model for the children in their professional care.

Having clarified what “personal development” means, we can further analyse “personality” itself - which seems to be easy only at a first glance. Without referring to one of the traditions such as classical psychoanalysis, social psychoanalysis, behaviorism, social-learning theory, humanistic psychology or cognitive constructs of personality in particular (see Potkay and Allen 1986; Craik, Hogan, and Wolfe 1993), we can understand personality as “semi-permanent internal predispositions that make people behave consistently, but in ways that differ from those of other people” (Eysenck 2000, 744).

As clearly defined such an operationalization and others seem to be, as much do they leave open with respect to the question how the promotion of peoples’ personal development and a possible personality change in them are connected, as the following illustration shows. In everyday life, we hear people saying that:

- someone has a personality. Such a statement would usually be completed by specifications such as extravert, aggressive and so on. This understanding of personality seems to be able to comply with the definition given above (Eysenck 2000, 744). Coming back to personal development, this first understanding of personality seems to be only loosely related to issues of personal development of early childhood professionals during their qualification. As it is self-evident anyone has some sort of personality, it would be trivial to merely state the necessity to develop it in others without any other qualities mentioned;
- someone is or someone fills a personality. Such statements do not comply with the definition given above (Eysenck 2000, 744), but they seem to be vaguely related, as highly subjective implicit beliefs play a crucial role which refer to certain qualities required for a “whole”, “well flourished” person. Coming back to personal development, this second understanding seems to meet the issues that academic and non-academic institutions implicitly strive to contribute for the personal development of their addressees much better than the previously mentioned.

### **Research methodology**

The study aimed at giving both a broad overview and selectively an in-depth-analysis on German early childhood education programs in respect to the aspect of personality development. Therefore the population of the investigation was all academic and non-academic programs of early childhood education in Germany. The sample was formed in a step-wise process considering both the curriculum of the programs and the praxis of personality development within the programs.

In a first step, relating to the research question (1) that asks for an overview on contents and methods of the qualification programs, the written formal foundations of early childhood teacher education in respect to personal development were analysed. This curriculum analysis entailed the following investigations:

- analysis of the general qualification guidelines like the German Qualification Framework (DQR) or the European Qualification Framework (EQR) that apply to both academic and non-academic qualification programs;
- analysis of the framework for the non-academic programs of teachers colleges as specified in special education plans for each of the sixteen federal states in Germany, and in a new cross-federal states-education-plan that has been in operation only since 2013;
- analysis of the academic curricula which is laid down in module handbooks for each study program at universities and universities of applied sciences.

That means that for the academic programs information on the individual study program was available as the module handbooks could mostly be downloaded from the University homepages.<sup>1</sup> In contrast, for the non-academic programs only information on federal-states-level was accessible with reasonable efforts as the teacher colleges usually did not display their curricula on their websites so that they could not be considered in the analysis.<sup>2</sup> Therefore the data analysis procedures had to be adapted to the data available. Whereas the general qualification guidelines and the non-academic curricula - operating on a general level as well - could be searched through for explicit statements in respect to personal development goals and methods, the data analysing procedures of the academic programs turned out to be more complex, because descriptions of the curriculum in the module handbooks seldom use the term “personal development” or similar. So the authors of this paper had to interpret paragraphs which were selected from the module handbooks by scanning for keywords like “reflection”, “self”, “students personality”, “inner attitude” (“Haltung”) and others referring to intentions of personal development. During the process of interpretation the research group decided on the basis of developing a common

understanding whether certain paragraphs belong to the category “personal development” or if they rather refer to other objectives in the programs like competence-building.

A second step of investigation should give a first insight in interpretation and implementation of the curricula in the practice of personal development in early childhood teacher study programs. Therefore, educators in charge of the curriculum in different programs from randomly selected academic and non-academic institutions were interviewed in order to understand the role of personal development in their qualification programs and in their institutions. With these semi-structured expert interviews (Bogner, Littig, and Menz 2009) priorities, issues, methods and experiences in respect to personality development in the study programs should be explored.

The part of the project that tried to answer research question (2) aiming at an evaluation of the programs’ contribution to personal development from the points of view of trainers, students and alumni, undertook a deeper investigation of four programs from selected training institutes among the universities, universities of applied sciences and teachers colleges. The programs were chosen as a result of the analysis from part (1) with regard to special methods that are applied or in respect to the intensity of measures of personal development. In each of these selected institutions data to plot the personal view of central players (university lecturers / college teachers, students and alumni) were gathered with the following data collecting instruments:

- semi-structured interviews (Lodico, Spaulding, and Voegtler 2010) with university lecturers and college teachers were collected;
- group discussions (Bohnsack 2004, 2010) with current students were conducted;
- semi-structured interviews with former students now working as early childhood professionals were made.

The interviews and group discussions focused on how the aim of personal development is implemented and carried through within the programs and which effects students and alumni notice on their personality or/and on their professional praxis. The interviews and group discussions will be analysed after transcribing them by comparing statements to certain topics like aims of personal development, methods, experiences with it, perceived changes in one’s own personality or in acting in pedagogical practice.

## **Findings**

### ***Part (1) – personal development in early childhood teacher education***

In a first section, the analyses of the written documents which represent a basis for college-based vocational education as well as for university-based education are now presented. Written foundations for the college-based education, the 16 federal states curricula and the new overarching curriculum, emphasize the importance of personal development measures during the qualification of early childhood professionals in a uniform way. They even mention personal development on the very first pages and consider this subject to be a relevant one for acting professionally. Moreover two of the federal states curricula even go further and suggest patterns and characteristics the personality of the future professionals should entail.

The analysis of the module handbooks as data from the academic programs revealed a broader variety concerning the quantity as well as the quality of measures that should encourage personal development.

For each module handbook, the modules in which paragraphs placing emphasis on personal development could be identified were related to the total number of modules, giving rise to a percentage of personal development measures for each qualification program. Comparing the percentages of all module handbooks, it appears that there are remarkable differences between the programs (see figure 1). While on the one hand three of them consider personal development in each module (equals 100%) there are on the other hand four programs that pay, in their written foundations, no attention to this subject (equals 0%). The majority of the handbooks display the subject-matter personal development in up to a third of the modules (25 cases). 12 module

handbooks refer to personal development in more than one third and up to two thirds of their modules. And only four cases are to be found where more than two thirds up to 99% of the modules contain references on personal development.

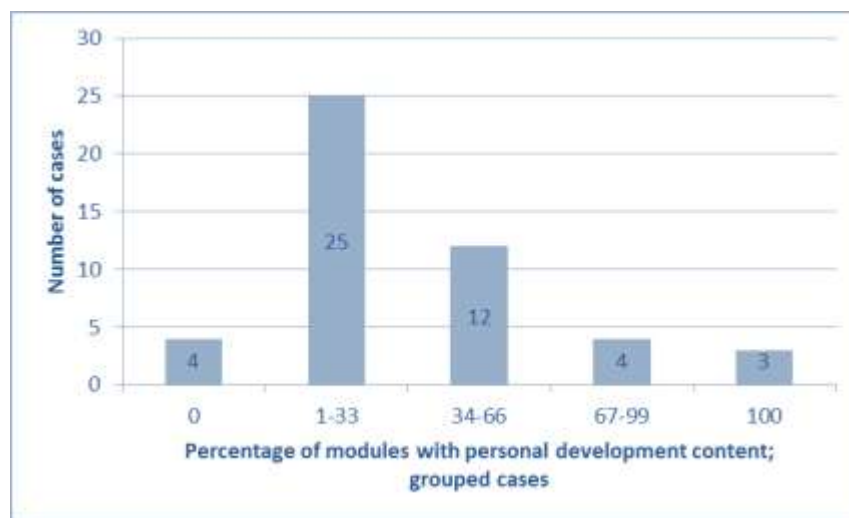


Figure 1. Number of module handbooks by percentage of personal development content; analysis of university programs in early childhood education; n=48

In addition to the quantitative differences concerning the percentage of modules that refer to personal development issues there are also qualitative differences between the module handbooks: There are early childhood teacher programs that have one or two special modules mainly aiming at encouraging personal development what is true for 21% of the module handbooks. Other programs (37%) take this subject systematically into account by providing a special category among the learning outcomes in each module referring to personal development.

In this second section the analysis of 13 interviews is presented that were, in addition to the analysis of the written curricula, conducted with professionals in charge of the curriculum from universities (7 interviews) as well as from teachers colleges (6 interviews).

One subject of the guideline was the question of the objectives of personal development: What kind of personality should an early childhood professional have? The most frequently mentioned features were self-reflectivity and biographical awareness. The professionals should not suppress the biographical aspects of their personality that influence their pedagogical profile, but instead reflect and deal with these aspects consciously. This could prevent, for example, the spread of suppressed conflicts to the children in their care. Moreover the own pedagogical acting should be reflected and regarded as something changeable to prevent the relapse into old patterns of behavior.

Additionally, important characteristics mentioned were communicative competencies, sensitivity and great empathy. The early childhood professionals should respond in a sensitive way to children and parents. This is especially important with regard to younger children under three years of age. Moreover, it is necessary to empathize not only with the feelings of the children but also to understand their cognitive development.

Beside these attentive characteristics, also demarcation-oriented features were mentioned. Professionals in early childhood education should be mentally and physically resilient, able to prevail and to set boundaries.

Moreover, the professionals in charge of the curriculum mentioned self-confidence and maturity as important personal characteristics. The students should have finished their adolescence and should be able to position themselves in the world of adults.

Eventually the students should incorporate a scientific “habitus”, meaning that they should have professional and methodological knowledge, be curious and develop their own questions. Also included is the constant updating of knowledge.

We can contextualize these findings on the topics addressed within the theoretical framework: The goal to develop their students’ personality, revealed implicit theories of the interviewed professionals about characteristics of a “whole”, “well flourished” person working in the field of early childhood education.

A second theme of the interviews was the methodology of personality development. The educators in charge of the curriculum were asked which methods they use in their institution to develop the personalities of future early childhood professionals.

Most often and not surprising, reflection of contents and experiences and of the own self was named as a tool of personal development. Peer counseling and supervision should also contribute to this objective. The argument here is that reflection as a cognitive transformation process helps to link new experiences to one’s inner reality. Another way pursued was the increase of self-awareness, and to drive students into situations where they can experience failure. The latter one was seen as valuable because they come to feel inner boundaries and through this can explore possibilities for further personal development. The experiences from placements, such as those gathered during working phases in kindergartens, were seen as essential, however, only in combination with reflection. To support all forms of reflection as an important way of personal development, supervision and peer counselling were considered helpful and necessary.

However, the interviewed educators pointed out that personality building mainly is a process of self-activity, participation and responsibility. All offers for reflection, supervision and peer counselling within the study programs are fruitless if not the student him- or herself gets active, engages oneself and takes responsibility to undergo a process of inner change. “Personality can only be formed by oneself [...]”, so the pronounced statement of one of the educators. That means all methods of personal development have to be taken up by the students themselves in order to achieve the intended effects.

In addition to the objectives and methodology of personal development, the role of the facilitator was another theme of the interviews. The professionals were asked how they would describe the role of the facilitator during the process of encouraging personal development and whether this role differs from the intended lecturers’ roles in other subjects. In addition to this, the project team wanted to know which special requirements lecturers have to comply to.

Most of the professionals held the opinion that the role as a lecturer in the special subject of personal development differs from the lecturer’s role in teaching other subjects, for example, mathematics or language. The main requirement for a lecturer was seen in being an authentic role model and embodying the subject he or she teaches. This is outlined by the following quotation: “I think concerning the encouragement of personal development, the students will rather take what is being exemplified, put into action by myself, than what I teach them in a lecture.”.

Moreover it was considered important for lecturers to also develop their own personality, such as by reflecting on their own roles and experiences. Then two contrasting pairs could be examined. On the one hand the lecturer should have a close and personal relationship to the students so that they could open up themselves and so that individual address and critical remarks are possible. On the other hand the lecturer should be able to keep the distance and to accept that the process of developing one’s own personality is only the business of the students. Another contrast derives from the fact that a lecturer which will encourage personal development must be methodical versed and master the main teaching methods, for example, supervision, coaching and biographical reflection although the majority of them are autodidacts concerning this subjects, never being trained to teach personal development.

Another subject of the interviews was the question of conducive and impediment factors for the encouragement of personal development during the qualification of early childhood professionals. The most frequently named conducive factors were freedom and time. For the lecturer this means freedom to design the lessons or the whole training, not being restricted by curricula, or learning objectives. The following quotation from an interview with one lecturer outlines this opinion: “I think the more I organize the study aiming at special contents, expected competences and outcomes, the less space remains for personal development [...]”.

For the students freedom was understood as having the opportunity to choose the themes and

to set priorities. On the other hand strict structures, guidelines, student assessment and marks have an impediment effect. Assessment and marks also interfere with the conducive factor “close and trustful relationship between students and lecturer”. The dilemma of the lecturers to be trapped between selection and facilitating self-experience was therefore often mentioned. The useful close relationship is also made difficult by the high personal turnover especially of the university staff.

A further mentioned conducive factor is a good interlocking between theory and practice, to have enough space to gain practical experience during the qualification which should be reflected and connected with the theory afterwards.

Moreover heterogeneity concerning the students as well as the lecturers is considered as conducive for personal development. Regarding students, this implies that personal development is supported by heterogeneity in terms of cultural background, age and former profession. Therefore, it would seem necessary to provide different possibilities of access to the studies for the students. The lecturer should also derive from different professions which are not only being affiliated with colleges or with universities (e.g. arts should be taught by artists).

The last impediment factor mentioned by the professionals is an unfit student's personality. Sometimes students have not yet reached maturity. They are not able to take responsibility or to respect agreements. In some cases the immaturity of the personality even prevents the completion of the vocational training.

### **Conclusions and implications for teacher education**

To summarize the main conclusions resulting from the first, completed part of the project: Personal development has become an important issue in the qualification and training of early childhood professionals in Germany. The underlying qualification framework gives special consideration to personal development. The curricula concerning the college-based qualification emphasizes the subject more uniformly whereas the module handbooks of academic early childhood studies substantially differ in quantity and quality of intended personal development. The main objectives of this subject are attentive features such as biographical awareness, sensitivity, empathy and communicative competences as well as demarcation oriented features such as being mentally and physically resilient and able to prevail and to set boundaries. One main method of personal development is different forms of self-reflection.

The role of the facilitator is demanding and, yet, mostly to be done without extra qualification. The “normal” surrounding of universities and colleges with their mission to select by performance, their strictly structured timetables, marks, teaching personal turnover etc. offers only limited adequacy for promoting personal development in their addressees in the eyes of the staff.

The results contribute to bridging the gap between the largely theoretical and political demands of relevant qualification frameworks like the EQF (see Ebert 1988; Greine 2004; Krenz 2008; Neuss and Zeiss 2013) and the limited body of research regarding the question how personal development of early childhood professionals during their qualification can be achieved. Academic as well as non-academic qualification programs in early childhood education can take the findings into consideration and reflect their curricula, concepts and modules regarding their respective interpretation, emphasis and realization of personal development as a challenge for institutions of higher education.

Several impulses and questions for further research can be drawn from these findings. Limitations of the presented study in methodological terms were acknowledged knowingly in view of the restricted body of research on the topic and the respective exploratory character of the research questions. On the basis of the presented findings, future research can apply methodical triangulation; both qualitative and quantitative methods have strengths and weaknesses in their contributions to understanding about particular subject areas of interest; when combined, they bear opportunities to neutralize the flaws of one approach and strengthen the benefits of the other for more differentiated research results.

One issue future research should address is the training of the lecturers. What could be done to prevent them from being self-taught people (autodidactic) in this demanding field? Do they need



a special qualification or at least the possibility to share experiences and to improve their qualification? Can Shulman’s (2005) idea of a “signature pedagogy” with distinctive profession-related methods to multiply competencies and knowledge (see also Bogard, Traylor, and Takanishi 2008) be an option worth consideration in this context?

Furthermore: How can a stand be formulated on the approaches found in our study when they are empirically compared to other approaches, such as providing educational professionals with foundational knowledge in personality psychology - following the hypothesis, that having an understanding of one’s own personality, and the personality of others, is not only relevant for their induction and has implications for meeting diverse needs of learners (Denzine, Martin, and Cramblet 2005), but also for their ability to be a personality role model for the children in their professional care? How do persons concerned evaluate the different strategies with respect to their professionalization?

Another question concerns the assessment of the acquired self-competencies. How can the personal development of early childhood professionals be evaluated both complying with scientific standards and a holistic understanding of the human being? Is it, at all, possible to assess the complex issue of changes in personality in a way as comprehensive as required for the context of research outlined above?

Moreover, it is necessary to regard personal development as a highly individual process. The students start from different points with different preconditions and this has to be taken into account while planning and implementing measures to encourage personal development. How can this goal be met best? Which other distinctive methods can be used for teaching and learning for this particular learning objective and the particular future professional challenges of early childhood teachers?

The last issue focuses on questions regarding limitations rather than possibilities. To which degree is it realistic to develop students with an already mature personality within qualification programs in a significant way? And last but not least we need to address the topic from an ethical point of view: How profoundly may a lecturer influence the personality of his or her students?

Further research is needed in order to clarify the outlined questions and cognate subjects. As the focus lies on (a) the development of individuals that face tasks and role requirements in educational contexts, and as this development is (b) looked at from the perspective of psychological dimensions, and as results can be (c) contextualized as contributions in the framework of socialization in adulthood and developing and unfolding a “habitus”, we see opportunities for interdisciplinary research between educational sciences, psychology and sociology in particular.

## Acknowledgements

This work was supported by the Mahle-Stiftung under Grant number 130158; and Waldorfstiftung im Bund der Freien Waldorfschulen [no Grant number].

## Endnotes

1. More than 100 academic programs of early childhood education have been established in Germany within the last 15 years (since the “academization” of early childhood teacher education has started). In this research project only the Bachelor programs were investigated as the Master programs are on a higher EQF-level and therefore not comparable with the college-based non-academic education. Furthermore, it was not possible to get hold of all module handbooks which diminished the number of cases that could be analysed in the end down to 48.
2. The number of non-academic programs is hard to establish because the programs are organized on the federal-states-level. Roughly estimated, there are 500 colleges for early childhood education in Germany (see for example two leading professional internet platforms in this field that count 490 colleges: “ErzieherIn.de das Fachportal für Frühpädagogik” <http://www.erzieherin.de/fachschulen/>; and “Socialnet. Das Netz für die Sozialwirtschaft“ <http://www.socialnet.de/branchenbuch/2406.php>; Accessed 2 March 2015.)

## References

Bogard, B., F. Traylor, and R. Takanishi. 2008. “Teacher education and PK outcomes: are we

- asking the right questions?” *Early Childhood Research Quarterly* 23: 1–6.
- Bogner, A., B. Littig, and W. Menz. 2009. *Interviewing experts*. Basingstoke, New York: Palgrave Macmillan.
- Bohnsack, R., ed. 2010. *Das Gruppendiskussionsverfahren in der Forschungspraxis*. Opladen: Barbara Budrich.
- Bohnsack, R. 2004. “Group discussion.” In *A companion to qualitative research*, edited by U. Flick, E. von Kardorff, and I. Steinke, 214-220. London, Thousand Oaks: Sage.
- Craik, K., R. Hogan, and R. Wolfe. 1993. *Fifty years of personality psychology*. NY: Plenum Press.
- Darling-Hammond, L., D. Holtzman, S. Gatlin, and J. Heilig. 2005. “Does teacher preparation matter? Evidence about teacher certification, teach for America, and teacher effectiveness.” *Education Policy Analysis Archives* 13 (42). <http://files.eric.ed.gov/fulltext/EJ846746.pdf>.
- Decker, L., and S. Rimm-Kaufman. 2008. “Personality characteristics and teacher beliefs among pre-service teachers.” *Teacher Education Quarterly* 35 (2): 45-64.
- Denzine, M., W. Martin, and L. Cramblet. 2005. “Do teacher education programs have personality?” *Current Issues in Education* 8 (3). <http://cie.ed.asu.edu/volume8/number3/>.
- Early, D., D. Bryant, R. Pianta, R. Clifford, M. Burchinall, S. Ritchie, C. Howes, and O. Barbarin. 2006. “Are teacher’s education, major, and credentials related to classroom quality and children’s academic gains in pre-kindergarten?” *Early Childhood Research Quarterly* 21: 174-195.
- Early, D., K. Maxwell, M. Burchinal, S. Alva, R. Bender, D. Bryant, K. Cai et al. 2007. “Teachers’ education, classroom quality, and young children’s academic skills: results from seven studies of preschool programs.” *Child Development* 78: 558-580.
- Ebert, S. 1988. “Erzieherausbildung als Persönlichkeitsbildung.“ *Sozialpädagogische Blätter* 39 (6): 155-156.
- Eysenck, M. 2000. *Psychology. a student’s handbook*. Hove: Psychology Press Ltd Publishers.
- Greine, R. 2004. “Persönlichkeitslernen. Ein Weg zu mehr Professionalität.” *Klein & groß* 12: 36-38.
- Kanning, U., W. Böttcher, and C. Herrmann 2012. “Measuring social competencies in the teaching profession - development of a self-assessment procedure.” *Journal for Educational Research Online*, 4(1): 140-154.
- Krenz, A. 2008. “Persönlichkeitsbildung sollte im mittelpunkt stehen. Erzieherinnenausbildung zwischen reform, resignation und revolution.” *Klein & groß*, 2-3: 21-24.
- Lodico, M., D. Spaulding, and K. Voegtler. 2010. *Methods in educational research: from theory to practice*. San Francisco, CA: Jossey-Bass.
- Neuss N., and J. Zeiss. 2013. “Biografiearbeit als bestandteil von professionalisierung.” *Theorie und Praxis der Sozialpädagogik* 1: 22-25.
- Potkay, C., and B. Allen. 1986. *Personality: theory, research, and applications*. Monterey: Brooks/Cole.
- Shulman, L. 2005. “Signature pedagogies of the professions“ . *Daedalus* 134 (3): 52-59.



## **Emerging as early childhood teacher: critical challenges**

*Dalila Lino<sup>1</sup>, Fátima Vieira<sup>2</sup> & Cristina Parente<sup>2</sup>*

*<sup>1</sup>Polytechnic Institute of Lisbon - CIED/CIEC, <sup>2</sup>University of Minho - CIEC, Portugal*

linodalila@gmail.com, fatima@ie.uminho.pt & cristinap@ie.uminho.pt

### **Abstract**

This study aims to understand the experiences of beginning early childhood teachers as they transition roles from student to first-year teacher. Research has shown that are major areas of concern for novice teachers: relationships, knowledge of the curriculum, evaluation and grading, issues in autonomy and control, and workload and time management. Research also has identified a troubling support gap for new teachers during their first critical years in the job. Fifteen early childhood teachers in their first year of teaching were interviewed for this case study research. Interviews' data were submitted to content analyse process which allowed identifying major themes, namely: initial expectations and feelings; problems and difficulties; types of support; achievements; critical moments; perceived changes. The data highlight the need to reflect on early childhood teacher education. The emphasis should be on how to help teachers to construct professional understanding from field-based experiences.

**Keywords:** beginning early childhood teachers; teacher education; professional development.

### **Context of the research**

The transition from pre-service teacher education to teaching has frequently been understood as a challenging experience for novice early childhood teachers (Alberto 2012; Ambroseti, Almeida, and Calil 2012; Mesquita-Pires 2007; Teixeira 2009). Our study explores, through a case study research, the first year professional experience reported by a group of 15 beginning early childhood teachers, working in day care and preschool settings. The research questions aim to understand the experiences of beginning early childhood teachers as they transition roles from student to first-year teacher, and their immediate areas of concern. Data reveals beginning early childhood teacher's views of pre-service teaching, and the impact that this had on their transition from student to teacher. They found that real working experience did not always match the pre-service teaching experience. The main differences identified are: the student teaching experiences did not provide them with the practical knowledge they need when start teaching; a gap between the quality of centers they are working and the centers where they did their practice at college; a different teaching philosophy from the settings and people that they work with, and feelings of dissatisfaction when they tried to establish ideal practices in their jobs; getting sufficient resources and materials.

### **Research aim**

The research aim is to understand the experiences of beginning early childhood teachers as they change their roles, from students to first-year teachers, and their immediate areas of concern.

### **Theoretical framework**

#### ***Beginning early childhood teachers: the first critical year in the job***

New entrants, upon accepting a teaching position in a school, are often left on their own to succeed or fail, confined to their own classrooms and experiences, and described by some authors as being “lost at sea” (Kauffman, Johnson, Kardos, Liu, and Peske 2002). Research on beginning teachers (Fuller and Brown 1975; Flores 1997; Veenman 1984; Vonk 1983) suggest the existence of various concerns and problems in the first years of teaching such as difficulties to motivate

students, to manage inappropriate behaviors occurring at classroom, and to teach and assess the individual student. The feeling of isolation and lack of support can intensify those problems.

Brouwer and Korthagen (2005) suggest the existence of a “latency period”, a time when workload and school-related practices override practices and ideals developed during pre-service teaching education. It is clear that this period of early distress is not good for individuals, schools, or community at large.

As for teachers in general the beginning of the career for early childhood teachers is experienced as a period of challenges, difficulties, resulting from the need to manage the diversity and complexity of tasks and duties of the profession.

Studies on the career of beginning early childhood teachers (Alberto 2012; Ambroseti, Almeida, and Calil 2012; Mesquita-Pires 2007; Teixeira 2009) identify various constrains that affect the professional experience, namely: interactions and relationships; curriculum development (organization of the physical space, materials and resources, management of time and groups of children, planning and evaluation, bureaucracy); discrepancy between personal and organizational conceptions and practices; lack of support from experienced colleagues. These conditions are intensified by feelings of insecurity and unpreparedness common of initial professional development.

Katz (1972) describes four stages of early childhood teachers’ development, namely: survival, consolidation, renewal, and maturity. The first two stages correspond to the first three years of the teaching career, and can help to understand the process beginning teachers go through as they transition from student teaching to the profession.

The survival stage is characterized by self-interest and self-concern. The teachers’ main concern is surviving the daily challenges of carrying responsibility for a whole group of young children, and for their learning and development. The discrepancies between success expectations and the contact with the reality of work provoke some anxieties, feelings of inadequacy and unpreparedness. During this period teachers need support, understanding, encouragement, comfort and guidance, and on-site training.

The consolidation stage emerges by the end of the first year. The teacher comes to see her/him-self as capable of dealing with daily challenges. She/him is likely ready to consolidate the gains made during the first stage, begin to focus on individual children, and specific pedagogical issues. During this stage it is import to continue with on-site training, which can lead to explore and solve problems in a collaborative way. Other important resources are the contributions of specialist such as psychologists and health-workers. The opportunities to share ideas, problems with more experienced colleagues and other teachers at the same stage of professional development can reduce teacher’s sense of frustration and inadequacy.

The renewal stage occurs by the four year of teaching, and is characterized by the need of doing new things and knowing different approaches, ideas, technics and materials. The need for renewal and refreshment can reveal a personal commitment to the quality of educational experiences. During this stage collaborative learning has an important role, which occurs through contact with other educational realities, participation in learning communities, to share and discuss new educational visions, insights, and experiences.

At the maturity stage that can be reached within three or five years of teaching, teachers begin to ask deeper and more abstract questions about her professional path, beliefs, values, and the role of education for societal change. These are not knew questions although they represent a more meaningful search for insight, perspective and realism (Katz 1972). The training should be focus on more wide and introspective discussions on themes and questions related with the profession.

The early childhood teacher professional development is a journey that involves changes at personal, theoretical, and pedagogical level. The diverse nature of those changes is associated with the characteristics of work contexts, the permanent reflection and questioning of teachers, and the growing awareness of the inherent complexity of their roles and functions.

## **Research methodology**

This case study research (Stake 2007) allowed to explore beginning teachers’ understanding about their roles, responsibilities, constraints and supports of their work contexts.

### ***Participants and contexts***

The participants of the study are 15 early childhood teachers in their first year of profession, graduated from one Portuguese University and one Portuguese College. The group was composed as follows: seven early childhood teachers working at infants and toddlers classrooms; and eight early childhood teachers working at preschool classrooms.

The 15 participants are women aged between 22 and 27. The institutions where they work are IPSS (Private Institutions of Social Solidarity, non-profit), and private for profit. They were invited to take part in the study on a voluntary basis.

### ***Data collection and analysis***

Qualitative data resulted from semi-structured interviews was collected over a 2-month period. All the interviews were audio-recorded, transcribed in full by researchers, and checked for accuracy by the participants.

The data collection was done in two phases. The first was the development of a preliminary interview script that was used with two beginning early childhood teachers in order to identify limitations of questions. The second phase was the development of the final script, and interviewing process. Early childhood teachers were interviewed by the researchers.

Participants were assured that would be made all efforts to respect the privacy of data from interviews, and they couldn’t be identified as participants in the research.

Content analysis of the interview’ transcripts have been conducted, compared and agreed by the three researchers in order to ensure the strength and accuracy or credibility of interpretations (Bardin 1995). Once all the data were collected and organized, the researches revisited the data to pull out the anecdotes and pieces of dialogue that reflected the most salient themes in each participant interview. An inductive approach allowed the identification of themes connected with the first year experiences and challenges of early childhood teachers.

Through data content analysis five major themes were identified: Initial expectations and feelings; Problems and difficulties; Types of support; Achievements; Perceived changes.

In order to make the process of content analysis as transparent as possible teacher’s codes have been included in the presentation of the findings.

## **Findings**

### ***Initial expectations and feelings***

One of the themes emerged from teachers narratives are related with emotions and concerns around their new roles and duties.

Participants reveal an apprehension of not being accepted and able to establish a positive and trust relationships with children and parents. “I was afraid of not being able to establish a trust relationship with children and parents. Was my first time working alone with a group of children without the support of someone more experienced.” (E).

The teachers’ comments show concerns focused on creating appropriate conditions to ensure children’s well-being, and to know what they need to learn.

“The initial insecurity was decreasing with time. The concerns have changed. My main concern was to do a pedagogical work with quality, to assure that children’s well-being and needs were met, to provide opportunities and experiences for learning and development.” (M).

Meeting coordination and direction requirements and expectations is understood as a considerable demand. As teacher professional development research has shown (Karge, Sandlin, and Young 1993; Katz 1972) new professionals seem to have concerns about themselves and their

own survival, about tasks and actual teaching duties, and about their impact on students learning - a concern related with their ability to be successful within teaching-learning process and students. To be committed to the well-being of children and the desire to be autonomous and free from external control or constraints can be understood as an indicator of becoming professional (Carr and Kemmis 1983).

### ***Problems and difficulties***

The main problems and difficulties of beginning teachers seem to be particularly related with pedagogical dimensions, such as: organization of space and materials; time structure and routines; adult-child interaction; group organization and management; planning to meet children’s interests and diversity.

In which concerns space and materials organization teachers refer not having enough space and lack of didactic materials in their classrooms. This was particularly reported by infants and toddlers’ teachers that complain not having books, and arts and craft materials to support educational activities.

Another problem faced by teachers was lack of time and routines’ structure. They realized the need to organize a daily routine that gives children a sense of security, decreases stress and anxiety, and allows coordinating children’s interests with teacher’s pedagogical intentions. “One of my first tasks was to establish a daily routine. Can you believe that when I started to work there, middle October, there wasn’t a daily routine? Everything was so confused, for children and for adults.” (E).

Feelings of frustration were generated by adult-child ratio and the group size. They experience difficulties working with large groups of children which affect the quality of pedagogical interaction. Working with large groups of children is a demanding task that requires teachers’ ability to deal with disruptive behavior and conflicts.

“It was a chock! I was not used to work with such a large group of children. When I did my internship, I had a group of 17 children, now I had to work with a group of 25 children. It was a big difference. I felt that I was not prepared...was very difficult.”

“My group was large, I had 25 children. They were frequently involved in conflicts. I’ve tried to support them to solve the conflicts, but some days the strategies that I used didn’t work out. I had to go back to the theory, to revisit what we’ve learned at the university, to ask the support of my colleagues. This was a long process until I felt that I was able to manage disruptive behaviors that occurred at my classroom.”

The work with other adults, colleagues, principles, and auxiliaries, represents another problem encountered by beginning teachers. They report lack of supports, sense of isolation, and control (explicit and implicit) of coordination and direction of centers where they work. Some teachers talk about feelings of dissatisfaction when tried to establish “ideal” practices. Initial enthusiasm and ideas of beginning teachers were blocked by the real work conditions, and result in feelings of insecurity and professional inadequacy.

“When we finish our course, we are full of new ideas, full of enthusiasm to start working and put all that we have learned in practice. I’ve learned so much at the university, the pedagogical models, working with parents...and then, we have a classroom, an institution that is totally different from everything that we have learned and we believe. I felt lost, I didn’t know what to do. I didn’t know how to deal with such pedagogical differences. I’ve started to do some small, very small changes in my classroom, but I realized that they were no very welcome. But, I didn’t give up. It was very difficult and still is.” (E).

In fact, like teachers of other levels of education (Flores 1997; Karge et al. 1993; Veenman 1984) these beginning early childhood teachers are confronted with problems related to classroom management and discipline, students’ individual differences, motivation and problems, students’ assessment, relations with parents, organization of class work, insufficient materials and supplies, and heavy teaching load resulting in insufficient preparation time.

### ***Support***

As noted above there are several problems and difficulties experienced by the participants of this study. Data analysis reveals that beginners, when facing problems and difficulties they look for

support to overtake the challenges. This support is sometimes found in former classmates group from initial training with whom beginning early childhood teachers continue to share anxieties, problems, dilemmas, feelings and achievements. Sharing professional experiences is seen as an important source of emotional support.

“When I’m very anxious, when I have a problem, I call D and F (former classmates). We do this a lot; call each other to share the good moments and the bad ones. We share ideas, experiences, and we help each other to solve problems and difficulties. To know that they are there, no matter what happen, make me feels secure.” (C).

At pedagogical level the participants mention the relevance of support and advice of others classroom teachers of their work center. The support from peers allows responding with efficacy to professional tasks such as: guidance and collaboration on children’s observation and documentation of their learning, and construction of assessment portfolios; and curriculum planning. The sensibility and openness of colleagues/peers to their personal ideas and initiatives is also valued as opportunity to develop confidence in their own capacities and a sense of progressive autonomy.

“Working with more experienced colleagues, their advices, knowing that they were there listening and supporting, was very important. I would say that the whole pedagogical team, and above all the coordinator, was an important support to deal with difficulties and anxieties.” (J).

The relations developed in the workplace, are an important contribution not just to overcome the practical difficulties but also for the emotional support of professionals, who thus have the opportunity to build or consolidate a more positive image of the profession and of themselves, which is valued through the acceptance of their knowledge, ideas and energy (Day 2001). Children’s parents can also be a source of support for the novices when they appreciate their professional work and respond positively to their requests.

“At the beginning, one of my main concerns was to establish a secure relationship with children’s parents. Then, after some months working at the infants and toddlers’ center they were my big support. When they realized that they could trust on my work, and they start to understand how it was important for children’s learning, they were always willing to collaborate. They would collaborate in the development of different activities, bringing materials for classroom activities and projects, helping on the construction of a variety of resources. With their collaboration, and support, I’ve started to feel that I was doing a good job... that I was able to develop quality practices for the young children that I had under my responsibility.” (E).

Other support sought by novice teachers lies in the return to the theory, the knowledge built during the undergraduate and master’s degree, and current research data on early childhood education. This assumption may indicate the need to look for a practice better sustained on theory (more intentional), and simultaneously the recognition that professional knowledge must be grounded in theory and research (Carr and Kemmis 1983).

Context based training is another support mentioned by one of the teachers of this study. She highlighted the contributions of being involved in continuous training provided by the work institution. This kind of training is linked to curriculum development and addresses the needs identified by teachers in their daily work with children and adults.

“One of the most important things was the training on the curriculum model adopted by the institution. Of course that already had studied that curriculum model, but was just in theory; I had never an opportunity to put it into practice. Having training at the context of my institution which was related with the implementation of the curriculum model was very helpful to overcome difficulties and problems from daily practices.” (A).

The influence of work contexts can have a positive or negative impact on professional development of beginning teachers. In fact Alarcão and Roldão (2010) distinguish the diversity of possible contexts dividing them into unfavorable and favorable. They refer to the first as adverse, with difficult communication, “isolated islands”; and to the second as stimulant, dynamic, based on teamwork and the collaborative relationships that aim to “establish true communities of reflective practice”.



### ***Achievements***

One of the first achievements mentioned by novice teachers is their awareness of increase sensibility to children’s safety and well-being. In fact this was initial concern mentioned by teachers, which has driven to the development of a learning environment that assures the safety and welfare of the group with whom they work.

The ability to observe children, and focus on their skills, interests and potentialities is another achievement mentioned by participants. They realized that this professional competence is simultaneously a tool and a source to understand the process and the content of children’s learning. This competence is associated with the perception that the work they are doing has a positive impact on children’s learning.

“It was above all seeing that he was getting results. The introduction of a daily routine and realize that it was meaningful to children (they recognized that there were different times ...), the autonomy acquire by children (e.g. at wake up time they were able to dress themselves and help their classmates; at lunch time they were able to seat properly at the table, and feed themselves).” (A).

Another achievement mentioned by participants is related with the ability to share control with children, and to enhance their participation in classroom activities. From teachers’ perspective this accomplishment results from an increase capacity to interact and communicate effectively with children. This achievement is related to a sense of satisfaction with the opportunity to put into practice one of their personal beliefs about teaching and learning process.

“One of the “hits” of my work was when I realized that I have involved children in decision making of classroom daily activities. At the beginning of the academic year this was so difficult. They were so young, and I was afraid that something could happen... I know, of course that I know, we studied that they are competent, and able to make decisions, to make choices, to do things by themselves. But when we are the ones that are responsible for everything that can happen to them (children) when they are at the center, then we feel insecure, and the first thing is try to protect and even make decisions for them. Then, suddenly, I realized that I was giving them opportunities to make decisions, to try new things and do other things by themselves.... this was a great achievement.” (A).

The positive feedback of parents during formal and informal meetings was an important contribution to assure the quality of the work they were doing. As stated by one of the participants:

“The parents realized that there had been changes, they listen to children speaking about changes, they noticed changes in the classroom, and saw changes in the placard that was in the doorway ... This moment was a support for me. It was very important to see how they recognized my work.” (F)

Teachers understood how helpful could be to involve parents in curriculum development. They also discover that parents were a valuable resource to learn more about children, and to solve problems and difficulties experienced in daily practices.

### ***Perceived changes***

The participants of this study acknowledge that the choice of the profession was the right one. The experiences, difficulties, problems and achievements of the first year enhance their confidence in their own capacities, and expand the expectations of acting appropriately in the future. “This experience helped to become more confident because I realized that I could develop a coherent and consistent work; now I know that I can.” (C).

The pre-service path seems to have an important influence on preschool teachers’ confirmation that they have chosen the right profession. The most relevant issues developed at pre-service education identified by beginning teachers are: knowledge base; support of peer and pedagogical coordination; competence to reflect critically about their own practices (Sheridan, Edwards, Marvin, and Knoche 2009). Thus beginning teachers have identified central dimensions of early childhood profession (Oliveira-Formosinho 2000). For the majority of these beginning teachers, the first year experience was an opportunity to confirm their competence as preschool teachers.

## Conclusions and implications for teacher education

The results of this study confirm the findings of other Portuguese researches on beginning early childhood teachers (Alberto 2011; Mesquita-Pires 2007; Teixeira 2009), that show critical challenges of first year on the profession. Data highlighted mix of feelings and expectations ranging from enthusiasm, energy to fears and anxieties that are typical features of survival stage presented by Lilian Katz. As teachers in general, the participants mentioned problems and difficulties at different levels, namely: curriculum development; interaction and relations with professional of their work contexts; and institutional demands. Although this scenario data reveal that during the first year there are various supports which facilitate the perceived changes. These changes confirm the initial expectations of becoming competent and engaged early childhood teachers.

The data of this study allowed the identification of several implications for pre-service and in-service teacher education.

The first implication is the need of longer and diverse internships in early childhood education: infants and toddlers, and preschool. This will allow students to contact with diverse preschools, and infants and toddlers’ pedagogical contexts. Within Bologna Process the Preschool Education Master is developed during one academic year, which limits the time that students have to observe diverse contexts of practices, and reduces the duration of internships.

The second implication for teacher education is to create opportunities for student teachers to reflect on their own educational philosophy and the educational philosophy of their internships contexts. To create opportunities for students to reflect about those differences, and help them to identify strategies to manage them will better prepare them for the pedagogical diversity of work contexts.

The third implication is to reinforce the training on children’s observation, planning, assessment (learn how to follow children’s interests), manage the children’s behavior, plan and organize transitions, working in teams, and learn how to involve parents in their children’s learning.

From data analyses emerge other questions related with the support of early childhood professional development. From the questions arisen we emphasize the development of partnership programs between early childhood educational centers and universities toward supporting beginning teachers. These partnerships can assume different forms, such as: specialized training, mentoring, communities of practices or collegial study groups (Zaslow and Martinez-Beck, 2006), and research projects focus on practice.

The actions mentioned above aim at empowering beginning teachers to enhance professional competence, which requires to seek deep understandings of professional practice and its specificity, to develop decision making processes, to undertake control over daily experiences, and their own professional development, to develop skills of critical reflection on practice, to conduct action research projects, and therefore improve effectiveness of their own teaching.

The limitations of this study are related with limited number of participants, a single source of information and scarcity of specific literature or relevant studies on the problem under study, in particular, regarding beginning early childhood teachers. Therefore is important to develop further studies on early childhood beginning teachers aiming to deepen the results of this study, and seeking to know the singularity of their pathways of professional development.

## References

- Alarcão, I., and M. Roldão. 2010. *Supervisão: um contexto de desenvolvimento profissional de professores*. Mangualde: Pretexto Editores.
- Alberto, S. 2012. *A entrada na profissão do educador de infância: percursos singulares*. Master (diss.), Escola Superior de Educação de Lisboa.
- Ambrosetti, N., P. Almeida, and A. Calil. 2012. “Ingresso profissional: aprendizado da docencia no espaço escolar.” In *III Congresso Internacional sobre professorado principiante e inserción*

- profissional a la docencia*. Santiago de Chile, 29 Fevereiro-2 Março 2012.
- Bardin, L. 1995. *Análise de conteúdo*. Lisboa: Edições 70.
- Brouwer, N., and F. Korthagen. 2005. “Can teacher education make a difference?” *American Educational Research Journal* 42: 153-224.
- Carr, W., and S. Kemmis. 1983. *Becoming critical: knowing through action research*. Waurn Ponds, Vic: Deakin University Press.
- Day, C. 2001. *Desenvolvimento profissional de professores: os desafios da aprendizagem permanente*. Porto: Porto Editora.
- Feiman-Nemser, S. 2001. “From preparation to practice: designing a continuum to strengthen and sustain teaching.” *Teachers College Record* 103 (6): 1013-1055.
- Flores, M. 1997. “Problemas e necessidades de apoio/formação dos professores principiantes. Um estudo exploratório.” Master diss., University of Minho.
- Fuller, F., and O. Brown. 1975. “Becoming a teacher.” In *Teacher education*, edited by K. Ryan, 25-52. Chicago: University of Chicago Press.
- Oliveira-Formosinho, J. 2000. “Desenvolvimento profissional de educadores de infância principiantes: relato de uma investigação.” *Infância e Educação Investigação e Práticas* 2: 109-124.
- Karge, B., Sandlin, R., and Young, B. 1993. *Analysis of beginning teacher concern data to restructure preservice teacher education*. Paper presented at the Annual Meeting of the American Educational Research Association, Atlanta, GA.
- Katz, L. 1972. *Developmental stages of preschool teachers*. <http://www.eric.ed.gov/PDFS/ED057922.pdf>
- Kauffman, D., S. Johnson, S. Kardos, E. Liu, and H. Peske. 2002. ““Lost at sea”: new teacher’s experiences with curriculum and assessment.” *Teachers College Record* 104 (2): 273-300.
- Mesquita-Pires, C. 2007. *Educador de infância: teorias e práticas*. OPorto: Profedições.
- Stake, R. 2007. *A arte de investigação com estudos de caso*. Lisbon: Fundação Calouste Gulbenkian.
- Sheridan, S., C. Edwards, C. Marvin, and L. Knoche. 2009. “Professional development in early childhood programs: process issues and research needs.” *Early Education and Development* 20: 377-401.
- Teixeira, M. 2009. “Iniciação profissional de educadores de infância: perspectivas e inquietações.” In *Actas do X Congresso internacional Galego-Português de Psicopedagogia*, edited by B. Silva, L. Almeida, A. Barca Lozano, and M. Peralbo Uzquiano, 1510-1524. Braga: University of Minho.
- Veenman, S. 1984. “Perceived problems of beginning teachers.” *Review of Educational Research* 54: 143-78.
- Vonk, J. 1983. “Problems of the beginning teacher.” *European Journal of Teacher Education* 6 (2): 133-150.
- Zaslow, M. and Martinez-Beck, J. eds. 2006. *Critical issues in early childhood professional development*. Baltimore: Brookes.

Back to contents

## From learner to teacher: using reflection to develop mathematical teacher identity

*Patricia Eaton<sup>1</sup>, Christine Horn<sup>2</sup>, Miriam Liston<sup>3</sup>, Elizabeth Oldham<sup>4</sup> & Maurice O'Reilly<sup>5</sup>*

*<sup>1</sup>Stranmillis Univ. College Belfast, Northern Ireland; <sup>2</sup>Dun Laoghaire Inst of Art, Design and Technology, <sup>3</sup>University of Limerick, <sup>4</sup>Trinity College Dublin, <sup>5</sup>St. Patrick's College Drumcondra, Republic of Ireland*

p.eaton@stran.ac.uk, christine.horn@iadt.ie, mliston@hea.ie, eoldham@tcd.ie & maurice.oreilly@spd.dcu.ie

### Abstract

This paper explores the mathematical identity of students in teacher education programmes. The work was conducted by a team of researchers from five institutions in the island of Ireland, and was part of the study “Mathematical Identity using Narrative as a Tool” (MINT). The chief aim of MINT was to propose an efficient protocol for third level mathematics educators to explore the mathematical identities of their students. The MINT team developed an instrument - an online questionnaire based on earlier work - that was administered to teacher education students in three participating institutions, involving 64 student teachers, 26 non-specialists at primary level and 38 mathematics specialists at secondary level. The focus of this paper is on the theme identified as “Student teachers’ self-reflection on learning and teaching.” The main findings relating to this theme were that pre-service teachers’ mathematical identity evolves significantly in the transition from secondary to third (university) level, and that this evolution is intertwined with their commitment to teaching mathematics.

**Keywords:** teacher identity; mathematical identity; transitions.

### Context of the research

In view of the fact that theme of this conference is “transitions in teacher education and professional identities”, it is not surprising to find discussion on the importance of making identity transitions in teacher education more explicit (Olsen 2014), or to be presented with the fruits of a longitudinal study to capture the development of teacher identity over an undergraduate programme in initial teacher education (Seward and Renwick 2014). This paper concerns a related topic called Mathematical Identity, which studies the relationship student teachers (and others) have with mathematics and how that relationship evolves over time and, in particular, across transitions.

The context is a research project called Mathematical Identity using Narrative as a Tool (MINT), initiated in August 2011, with three aims:

- To propose an efficient and effective protocol for third level (university) mathematics educators to explore the Mathematical Identities of their students with a view to improving the teaching and learning of mathematics.
- To collaborate with researchers in five institutions in exploring students’ Mathematical Identity.
- To extend the work on Mathematical Identity undertaken in an earlier project called Mathematical Identity of Student Teachers (MIST), thus giving insight into how the Mathematical Identities of different cohorts of student teachers compare with one another and with those of students in other disciplines.

The data for MINT was gathered (see below) in April-May 2013 and initial findings we reported at the ATEE Annual Conference 2013 (Eaton et al. 2014). Here we report in some detail on evidence relating to how student teachers reflected on their own learning and teaching of mathematics.

## Theoretical framework

As the name of the study indicates, the framework underpinning this paper has two elements: Mathematical Identity and the use of narrative as a research tool. Each is outlined briefly below. A fuller account, tracing the development of the authors’ engagement with these two elements in the context of this study, is given by Eaton et al. (2014).

Mathematical Identity is considered here to be the multi-faceted relationship that an individual has with mathematics, including knowledge, experiences and perceptions of oneself and others. This definition draws on the work of Grootenboer, Smith, and Lowrie (2006), Kaasila (2007), Sfard and Prusak (2005) and Wenger (1998), among others. Wenger’s contribution is seminal, and its origins can be traced back to his collaboration with Lave (Lave and Wenger 1991). Grootenboer, Smith and Lowrie (2006) see the potential of the concept of identity to connect diverse elements - such as beliefs, attitudes, emotions, cognitive capacity and life histories - all of which are of interest for research in mathematics education. For Kaasila (2007, 2006), “mathematical identity is manifested when telling stories about one’s relationship to mathematics, its learning and teaching”; “telling stories” suggests the use of narrative to explore identity, a point taken up below. Configuring this relationship differently, Sfard and Prusak (2005) equate identities with narratives, using them to investigate learning. Earlier work connecting Wenger’s notion of identity to mathematics education include that of Boaler and Greeno (2000), Graven and Lerman (2003) and Walshaw (2004).

According to Connelly and Clandinin (2006), narrative inquiry - the study of experience as story - is above all a way of thinking about experience; in earlier work they claim that it is “the best way” (Clandinin and Connelly 2000, 80). Sfard and Prusak (2005, 17) assert that identities (or narratives) are “collectively shaped even if individually told.” Kaasila (2007, 205) points out that “we live in a world of narratives” and observes (Lutovac and Kaasila 2009, 7) that through narrative we can see the development of a newly qualified teacher’s mathematical identity.

Thus we consider that an exploration of student teachers’ narrative about mathematics is the way to access their mathematical identity. This point earlier work (Eaton et al. 2014).

## Background

MINT is the third in a series of studies carried out in Ireland and addressing the Mathematical Identity of students, especially student teachers, via participants’ narrative accounts of their experience of mathematics. The two predecessors are outlined below. In MINT itself, after some introductory demographic questions (gender, institution, programme and year of study, age, mathematical qualifications) and eight five-point Likert items (see Eaton et al. 2014), a three-part protocol was used to elicit the students’ narratives, as follows:

- P1. Students were asked to respond in writing to the prompt: “Think about your total experience of mathematics. Tell us about the dominant features that come to mind.”
- P2. They were then offered a more structured prompt: “Now think carefully about all stages of your mathematical journey from primary school (or earlier) to university mathematics. Consider: why you chose to study mathematics at third level; influential people; critical incidents or events; your feelings or attitudes to mathematics; how mathematics compares to other subjects; mathematical content/topics. With these and other thoughts in mind, describe some further features of your relationship with mathematics over time.”
- P3. Finally, they were encouraged to reflect on the potential insights gained through completing the questionnaire: “What insight, if any, have you gained about your own attitude to mathematics and studying the subject as a result of completing the questionnaire?”

The first of the three studies, MIST (Mathematical Identity of Student Teachers), considered the identity of pre-service primary teachers who were specialising in mathematics (see for example Eaton and O’Reilly 2010, 2012). Two institutions participated: Stranmillis University College (SUC) in Northern Ireland and St Patrick’s College, Drumcondra (SPD) in the Republic of Ireland.

Introductory demographic questions and Likert items were used along with a two-part protocol (P1 and P2, above). The narrative responses were used to provide guidelines for focus group discussions, one in each college. Transcripts of these discussions, together with the original narratives, were analysed to identify common threads and themes (Clandinin and Connelly 2000). Using an approach informed by grounded theory, seven themes were identified.

The second study in the series is described here as the Bridging Study because of its role in leading from MIST to MINT. In this case, the students were undergraduate mathematicians at Trinity College, Dublin, who had elected to take modules in mathematics education. The Bridging Study began with a class discussion eliciting students’ attitudes to mathematics; this was followed by the two-part protocol, P1 and P2, but answered in the students’ own time as part of the module assessment. Analysis was based on the MIST themes, which were found to be adequate for describing the Bridging Study narratives (Eaton, Oldham, and O’Reilly 2012).

It is of interest to find whether the themes that arose in the MIST data, and served well to explore the data from the Bridging Study, would be found in the narratives of other student cohorts. A more streamlined approach, administered online, could facilitate efficient and effective use of the protocol in a wider variety of settings. Thus, for MINT, the protocol used in MIST and the Bridging Study was extended, most notably by the inclusion of the third part, P3 (see above), and made available to students online using SurveyMonkey. The research team of three people - the two from MIST, joined by an additional member for the Bridging Study - was augmented to five, with new members coming from the University of Limerick (UL) and the Dun Laoghaire Institute of Art, Design and Technology (IADT), both in the Republic of Ireland.

Lecturers who administer such a tool to their classes could be expected to tune in more acutely to their students’ learning, and thus improve their own effectiveness as teachers. Moreover, through use of the tool, students’ awareness of how their Mathematical Identity can influence their learning might be expected to sharpen, helping them to enhance their agency as learners. These broad aims underlie the present study, MINT, fuller details of which are given by Eaton et al. (2014). In the context of these aims, this paper seeks to explore the first of the MIST themes, namely, “student teachers’ self-reflection on learning and teaching.”.

## **Research methodology**

In the context of the broad aims just mentioned, and using the online instrument just described, the question explored in this paper is: “What evidence arises from using the instrument in three institutions (and on four distinct programmes in initial teacher education) relating to student teachers’ self-reflection on learning and teaching?” It was helpful to have participation from a fourth institution (IADT, involving two further programmes, but not in teacher education) for two reasons: to pilot the online questionnaire and to provide an “external” lens from a researcher-author deeply involved in MINT but working outside teacher education.

### ***Data collection and research sample***

The online questionnaire was piloted in IADT and ethical clearance was obtained in all participating institutions. The cohorts of student teachers selected to participate in each institution were drawn from primary and post-primary (i.e. secondary) programmes (the latter dealing with students from 11 or 12 to about 18 years of age); undergraduate and postgraduate; and mathematics specialist and non-specialist. Cohorts were chosen because of the ability of researchers to access particular groups at the time of year for the study (April/May 2013). As this is a busy time of year for students, and perhaps because participation was voluntary and students were asked to complete the survey in their own time rather than in class time or as an assessment exercise, the response rate was fairly low at 24%. Overall 64 student teachers (24 male, 40 female) from the Initial Teacher Education (ITE) cohorts participated, as summarised in Table 1.

Table 1: Number of ITE students who participated in the study by institution and type of programme

Type of programme	Institution		
	SPD	SUC	UL
Undergraduate Primary Non-specialist (in year 3 of a 3-year programme)	26	-	-
Undergraduate Post-Primary Mathematics/Science Specialist (in year 1 or 2 of a 4-year programme)	-	11	-
Undergraduate* Post-Primary Physical Education with Mathematics (in year 3 or 4 of a 4-year programme)	-	-	22
Postgraduate* Professional Diploma in Education, with Mathematics	-	-	5

\* These programmes are identified as UL(u) & UL(p), respectively

### Data analysis

Initial quantitative analysis was undertaken using SPSS and this has been reported on in a previous paper (Eaton et al. 2014). The qualitative data (responses to P1, P2 and P3) were subject to thematic analysis broadly based on that described by Braun and Clarke (2006). Both deductive and inductive analyses were applied. Previous studies had identified seven themes using an inductive approach and these formed the basis of the MINT analysis.

The five researchers were randomly assigned groups of data, ensuring each piece of data would be studied by three people, in such a way that data from each institution were studied by the researchers from that institution and others besides. At this stage the MIST themes were used and the data examined to see if these themes were apparent or if new themes were identified. Manual coding using an agreed colour scheme took place and the coded data were then made available to all researchers. A meeting was held to discuss work to date and debate ensued as to the meaning of each theme with some refinement taking place at this stage. In relation to the theme presented in this paper, “student teachers’ self-reflection on learning and teaching,” a consensus was reached that only data explicitly referring to self-reflection (such as “then” and “now” phrases) would be included; otherwise there could have been a danger of all data being coded with this theme as the task itself requires an element of self-reflection. Pink was the colour used to identify this theme. Researchers then individually recoded the data in light of these discussions and met some weeks later to review. At this meeting the main refinement was ensuring that all comments concerned with imagining the future and seeing themselves teaching, learning or using mathematics were captured in this theme. A third meeting was held to allow for agreement between all three researchers looking at each piece of data. Thus the data coding was completed.

### Findings

#### Quantitative considerations

Of the 64 participants (Table 1), 56 responded to at least one of the open-ended questions, P1, P2 and P3. Of these 56, 28 were coded “pink” (i.e. as having shown self-reflection on learning and teaching in at least one of the three questions). Table 2 summarises the pink coding overall and for each of the three questions individually.

Table 2: Number of responses to the three open-ended questions and those coded as having shown self-reflection on learning and teaching

Responses	SPD	SUC	UL(u)	UL(p)	Total
Responded to at least 1 open-ended question	22	9	20	5	56
Response to some question was coded ‘pink’	17 (77%)	1 (11%)	7 (35%)	3 (60%)	28 (50%)
Response to P1 was coded ‘pink’	9	0	4	2	15
Response to P2 was coded ‘pink’	12	0	2	0	14
Response to P3 was coded ‘pink’	11	1	3	2	17

An insight revealed by these demographic data is that reflection on learning and teaching depends greatly on the cohort to which ITE students belong; this, in turn, is likely to depend on factors such as the stage at which they are in their programme, whether the focus of the programme is predominantly on mathematics or on pedagogy, and indeed students’ general level of maturity. Thus first and second year undergraduates specialising in post-primary mathematics/science (at SUC) are less inclined to report reflections on learning and teaching, while final year non-specialist undergraduates preparing to be primary school teachers (at SPD) are more inclined to do so. The number of mature postgraduate students (at UL) who included reflections on learning and teaching is close to the expected 50% (although the sample is very small), while the undergraduate mathematics specialists (at UL) showed somewhat less evidence of reflection.

### *Qualitative considerations*

Attention is now turned from the quantitative summary of the qualitative data to the “pink” responses themselves and the identification of what was noteworthy about how students expressed their self-reflection on learning and teaching. Across all three questions (P1, P2 and P3) there were 46 (= 15+14+17, see Table 2) pink responses, that is to say that somewhere in each of these 46 responses, evidence of self-reflection on learning and teaching was perceived by three of the researchers, in independent examination of the data. Of course the degree of evidence varied amongst these responses: in some instances there was strong evidence, in others the evidence was not so strong. One of the researchers inspected these data again and identified the 19 responses (involving 17 distinct respondents) for which the evidence was strong. For example, the following response to P1 was considered “strong”: “When I came to third level my attitude towards Maths changed in this regard as I constantly wanted to see how it applied to real life and what way can I present this material so others will engage with it and learn from it.” On the other hand, here is a “weak” response to the same question: “Overall, I am confident in my teaching of mathematics to primary school children, maybe having to double check things before teaching the older classes.” Each of the 19 responses was then distilled by removing text not immediately related to the theme under consideration (while keeping the context intact). Finally an inductive approach was applied to seek out common aspects of self-reflection on learning and teaching. This involved cutting up hard copy of the 19 responses, arranging them according to similarities between them, and finally naming what aspects characterised the groups that emerged. This entire process gave rise to the following four aspects:

- (A1) Journey across at least one transition giving rise to new perspectives and increased maturity (in relation to mathematics);
- (A2) Statements of aspiration and commitment in relation to teaching mathematics;
- (A3) Appreciation of the challenge of learning mathematics as the substance behind growing in confidence as a teacher-in-the-making;
- (A4) “Math anxiety” and, in particular, (still) feeling poorly prepared to become a teacher.

This distillation and induction was carried out by one researcher and checked by another who concurred with the process and conclusions. It is not expected of these “aspects” that they are as robust or clearly defined as the “themes” that emerged from the MIST study (one of which is the focus of this paper), rather they depend on the context of the data under consideration and serve the purpose of providing a “local” framework for their discussion. In the illustrative quotations below, a respondent identifier is given in each case, along with the part of the protocol (P1, P2 or P3) to which to response refers, and the respondent’s programme of study (see Table 1). Table 3 indicates the spread of the responses, according to P1-3 and A1-4.

Table 3: Respondent numbers for 19 responses arranged according to question (P1-3) and aspect (A1-4)

Part of Protocol	A1	A2	A3	A4
P1	117, <b>204</b> , <b>212</b>	136	<u>129</u>	<b>110</b> , <b>207</b>
P2	139, <u>148</u> , <u>167</u>	<b>115</b>	<u>125</u> , 129	147
P3	<u>113</u>	<b>124</b> , <u>130</u>	139	<b>214</b>



In this table, the seven respondents in bold were UL students - with respondents 212 and 214 being postgraduates, all other respondents were SPD students. The nine underlined respondents are those quoted in the discussion which follows.

The first aspect (A1) concerns respondents’ reflection on a “journey” across at least one transition giving rise to new perspectives and increased maturity, in relation to mathematics. All three excerpts (emphasis in bold added) relating to this aspect draw attention to working at the subject oblivious to understanding the processes or purpose involved. In the first one, the issue of time constraints resulting in less than ideal practice is mentioned:

“While in school I think a lot of my experience revolved around rote learning. The teacher tried to reinforce student understanding, however to save time we were often told to just learn it. In college I seemed to have a eureka moment where everything came together and finally all the gaps in my knowledge became filled in. I believe that this was due to us taking a topic and studying it for 3 months instead of taking numerous topics and trying to study them in 2 years for the Leaving Certificate.” 212 P1, UL (p).

In this one, as in the next, it is clear that new perspectives unfolded in university (“college”) as more effective ways of working with mathematics arose.

“It wasn’t until I came to college, I realised I had actually been taught maths in quite a bad way. I didn’t know why I did any calculations, I just did them! I always liked maths because I was able to tidy it up & I’d feel good getting the right answer, there were no grey areas but since coming to college I realise we need to be having conversations about different ways of doing things, there isn’t just one right way.” 148 P2, SPD.

Moreover, a significant change of attitude towards the subject and how to work with it is very apparent:

“I have realised that my attitude towards maths has changed over time and it largely results in the fact of a lack of conceptual understanding during my study for the Leaving Certificate exam course.” 113 P3, SPD.

It is interesting to note that insights on respondents’ self-reflection arose from each of the three questions in the three-part protocol (P1-3), indicating its effectiveness.

Next, two statements of aspiration and commitment in relation to teaching mathematics (aspect A2) are considered:

“I enjoy teaching maths and helping students to overcome their problems of understanding. I would like to teach mathematics in a way which promotes understanding and helps to move away from the way I was taught maths in my secondary school experience.” 115 P2, UL (u).

“It is good to be able to reflect on your own experience and think critically about the way you were taught. It gives me an insight into how I was taught and how I could apply the way I was taught to my own teaching or instead learn from it and ensure that I teach maths in a better way if possible. I was always aware of my love for maths, particularly during my years at secondary school but often I forget that maths for some people is very daunting and some people are terrified if presented with a maths problem.” 130 P3, SPD.

There is a clear commitment, in each case, to do the job of teaching mathematics well. There are, of course, elements of aspect A1 (the journey across transitions) here also and it is perhaps not surprising that the aspects are intertwined.

The third aspect (A3) relates to an appreciation of the challenge of learning mathematics as the substance behind growing in confidence as a teacher-in-the-making. It is reasonable to suppose that a respondent’s positive reports of teaching practice will build not only confidence in, but commitment to teaching (A2).

“I would feel confident teaching maths in primary school ... I feel that the lectures in college have opened my mind to how maths can be taught and I like the kind of maths that is covered at this level. I enjoyed teaching maths on teaching practice and I feel that I managed to effectively help the children to develop their understanding of the topics I covered with them.” 129 P1, SPD.

“I think we need to build up pupils’ mathematical awareness and present them with suitably challenging material in order to maintain interest and engagement. Presenting pupils with material that is geared towards an ability level far beyond their own can result in frustration around the topic/subject.” 125 P2, SPD.

This suggests that respondent 125 is sensitive to the importance of pitching mathematical material at a level that is at once sufficiently challenging, but not too much so, for the pupils in her class.

The final aspect (A4) relates to math anxiety and, in particular, to student teachers (still) feeling poorly prepared for their chosen career.

“I enjoyed maths but it was almost complete rote learning and basic topics I learning about in college I never covered in school. I feel I can help students understand maths and teach it well but I am worried about my mathematical knowledge not being enough for higher level students at Leaving Certificate level.” 207 P1, UL (u).

“It has struck me how my confidence in Maths has been almost completely destroyed by the last two years of study. A lack of interest in the subject has now ensued and the feeling of doing maths is more like doing an overly long chore at home for your parents rather than a challenging and interesting subject which it used to be. I now feel that even though I will qualify as a mathematics teacher I will most likely have to think long and hard about continuing in this line of career. The passion for the subject is gone and I feel I could be a negative influence on the students in my care. My hope is that once I have taken a sufficient amount of time from the subject and college, I will have a much more positive view of my maths experience.” 214 P3, UL (p).

Each of these respondents expresses a call for further support before embarking on a career as a mathematics teacher; however, the fact that the call has been articulated in such a forthright way indicates, at least, an awareness of unfinished business.

### **Conclusions and implications for teacher education**

Mathematical Identity, considered as the multi-faceted relationship that an individual has with mathematics, including knowledge, experiences and perceptions of oneself and others, continues to be a useful and vibrant subject for research in mathematics education, and in relation to pre-service teachers, in particular. It is useful because of the rich insights it can give teachers into their students’ learning, and enhanced agency for the learners themselves. The three-part protocol, at the core of the MINT questionnaire, is an effective method for harvesting students’ narrative about their relationship with mathematics; this narrative, in turn, is a tool for revealing mathematical identity. Moreover, the questionnaire can be administered effectively and efficiently online to student cohorts from different programmes that include mathematics at some level. The qualitative analysis of the narratives can be carried out effectively using the themes that emerged from the earlier MIST study.

The detailed consideration given in this paper to one of the themes, namely student teachers’ self-reflection on learning and teaching, indicated that how students experience and engage with this theme can depend significantly on the context of their programme of study. In particular, it appears to matter whether the programme emphasis is on mathematics itself or on pedagogy, as well as on the general maturity of the students. A method of distillation and induction can be applied to the narrative data to draw out more detail of aspects “local” to the context of student cohorts. In the data analysed, four aspects emerged by this process: how “transitions” impinge on mathematical identity, students’ sense of commitment to teaching mathematics, their appreciation of the challenge of learning mathematics and their own growth in confidence as teachers, and, finally, their intimations of anxiety in relation to teaching the subject.

In Ireland there is increasing awareness amongst those concerned with teaching mathematics about the problems students have in navigating transitions such as from primary to secondary or from secondary to university level. This has led to a recent study (O’Sullivan et al. 2014) in how to support students, especially across the latter transition. The MINT project and the work outlined in this paper, in particular, indicate the critical role of transitions in student teachers’ mathematical identity. There is scope for further research on how mathematical identity might illuminate transition problems in mathematics.

## Acknowledgement

This work was supported by the Standing Committee on Teacher Education, North and South (SCoTENS).

## References

- Boaler, J., and J. Greeno. 2000. “Identity, agency and knowing in mathematics worlds.” In *Multiple perspectives on mathematics teaching and learning*, edited by J. Boaler, 171-200. Stamford, CT: Ablex.
- Braun, V., and V. Clarke. 2006. “Using thematic analysis in psychology.” *Qualitative Research in Psychology* 3 (2): 77-101.
- Clandinin, D., and F. Connelly. 2000. *Narrative inquiry: experience and story in qualitative research*. San Francisco: Wiley.
- Connelly, F., and D. Clandinin. 2006. “Narrative inquiry.” In *Handbook of complementary methods in education research*, edited by J. Green, G. Camilli, and P. Elmore, 3<sup>rd</sup> ed., 477-487. Mahwah, NJ: Lawrence Erlbaum.
- Eaton, P., C. Horn, M. Liston, E. Oldham, and M. O’Reilly. 2014. “Developing an instrument to explore mathematical identity: a study of students from several third level institutions in Ireland.” In *Association for Teacher Education in Europe 38th Annual Conference*, edited by E. Arntzen, 280-296. Brussels: Association for Teacher Education in Europe.
- Eaton, P., E. Oldham, and M. O’Reilly. 2012. “Nature and nurture: an analysis of mathematical identity of distinct cohorts of prospective teachers.” In *Teachers’ Life-Cycle from Initial Teacher Education to Experienced Professional: 2011 ATEE Annual Conference*, edited by I. Žogla and L. Rutka, 29-43. Brussels: Association for Teacher Education in Europe.
- Eaton, P., and M. O’Reilly, 2010. “What other people think and why it matters? An investigation of key influences on mathematical identity.” In *2009 ATEE Annual Conference*, edited by M. Montané and J. Salazar, 290-298. Brussels: Association for Teacher Education in Europe.
- Eaton, P., and M. O’Reilly. 2012. “What is mathematics and why do we study it? The views of student teachers. In *Teachers’ Life-Cycle from Initial Teacher Education to Experienced Professional: 2011 ATEE Annual Conference*, edited by I. Žogla and L. Rutka, 255-264. Brussels: Association for Teacher Education in Europe.
- Graven, M., and S. Lerman. 2003. “Review of communities of practice: learning, meaning and identity.” *Journal of Mathematics Teacher Education*, 6: 185-194.
- Grootenboer, P., T. Smith, and T. Lowrie. 2006. “Researching identity in mathematics education: the lay of the land.” In *Identities, cultures and learning spaces*, edited by P. Grootenboer, R. Zevenbergen, and M. Chinnappan, 612-615. Adelaide: MERGA.
- Kaasila, R. 2007. “Using narrative inquiry for investigating the becoming of a mathematics teacher.” *ZDM Mathematics Education* 39 (3): 205-213.
- Lave, J., and E. Wenger. 1991. *Situated learning: legitimate peripheral participation*. New York: Cambridge University Press.
- Lutovac, S., and R. Kaasila. 2009. “Using narratives as innovative tools in finnish teacher education.” In *Proceedings of the Conference “Development of Competencies in the World of Work and Education*, edited by S. Pavlin and A. N. Judge, 355-359. Ljubljana, Slovenia: University of Ljubljana.
- Olsen, B. 2014. “Teacher identity: transitions, conflicts, and consequences.” Paper presented at the ATEE Annual Conference 2014, Braga, 25-27 August 2014.
- O’Sullivan, C., C. Mac an Bhaird, O. Fitzmaurice, and E. Ní Fhloinn. 2014. *An Irish mathematics learning support network (imlsn) report on student evaluation of mathematics learning support: insights from a large scale multi-institutional survey*. Limerick: NCE-MSTL.
- Seward, D., and A. Renwick. 2014. “Replacing the cardigan: teacher identity in year two

undergraduate initial teacher education students.” Paper presented at the ATEE Annual Conference 2014, Braga, 25-27 August 2014.

Sfard, A., and A. Prusak. 2005. “Telling identities: in search of an analytic tool for investigating learning as a culturally shaped activity.” *Educational Researcher* 34 (4): 14-22.

Walshaw, M. 2004. “Preservice Mathematics teaching in the context of schools: an exploration into the constitution of identity.” *Journal of Mathematics Teacher Education* 7: 63-86.

Wenger, E. 1998. *Communities of practice: learning, meaning and identity*. Cambridge: Cambridge University Press.

[Back to contents](#)



## **Cultural characteristics of knowledge and explanation of the meaning of geometric transformation: implication for teacher education**

*Xhevdet Thaqi & Joaquim Gimenez*

*University “Kadri Zeka” Gjilan, Republic of Kosovo & University of Barcelona, Spain,*

*xhevdet.thaqi@uni-pr.edu & jgimenez@uoc.edu*

### **Abstract**

The research has shown that primary school teachers possess low level of knowledge on geometrical transformations. This might be partly due to the reduced level of mathematics education that most primary school teachers are conveyed during their under-graduation programmes. It can also be due to the cultural aspects of conceptual knowledge and to the explanation of geometric transformations that are offered to them. Kosovo and Spain differ from each other in regards to teaching of geometrical transformations. Thus, These findings suggest that primary school teacher education should know different structures of construction of concept of transformation; different analysis of construction of isometric and non-isometric transformations; design of global practice of teaching transformations; they should also be able to investigate process of construction of geometrical transformation and to know that the culture implies in cognitive aspects of geometrical transformation.

**Keyword:** teacher education; geometric transformation; culture of teaching.

### **Context of the research**

The cultural factors include constructions of personal meaning of prospective teachers about geometric transformations in the process of the practice development of peculiarities of the prospective teachers to understand, to relate and to organize contents, terms and geometric properties of geometric transformations. Teaching and learning Geometrical transformations in Kosovo and Spain differ from each other with regard to peculiarities mentioned above. In this paper it seems worthwhile to understand the factors that are responsible for prospective primary school teachers' reduced content and pedagogical content knowledge regarding the geometrical transformations, so that proper strategies can be designed to promote teachers' professional development and to improve mathematical education.

As far as these purposes are concerned, we are interested in comparing the socio-cultural aspects that pervade prospective primary school teachers' ways of dealing with geometric transformations, and in analysing prospective primary school teachers' constructions of personal meanings of geometric transformations. Data analysis acknowledged the different cultural characteristics of the two groups of pre-service teachers in Kosovo and Spain. The meaning of Geometrical Transformation is explained by using contexts of both places, but while in Spain the Transformation is understood like a manipulative operation, in Kosovo it is understood as a change of place; in Spain is used the visualization while in Kosovo the mathematics concepts; while in Spain Geometrical Transformation is seen as a change - function of a figure to another figure, in Kosovo they see it as a function of a set of points (points to points).

### **Research aims**

The objectives of this study are: compare the socio-cultural aspects that pervade prospective primary school teachers' ways of dealing with geometric transformations, and to analyse prospective primary school teachers' constructions of personal meanings in terms of geometric transformations.

## Theoretical framework

Sundry authors have distinguished the everyday concepts (known as spontaneous) and so did the scientific (Piaget 1970; Vigotski 1987). Fischbein (1993) considered that there have been seen three types of conceptual construction in the investigation: inductive, deductive and inventive formation. Later on, the same author explains us that the concepts are the results of accumulated social experiences (Fischbein 1993). We consider that there has to be build the conceptual meaning in interaction with contexts grounded in the experiences, to later build images and abstractions. Some authors like Sowder (1996) proposed that what characterizes a concept is to state an idea that is given like an answer to non similar stimulations (to varnish understanding like examples). In the opinion of Fischbein (1993) what characterizes the concept is the fact to state an idea, general representation of a class that is based in common characteristics.

The conceptual construction rests on a set of processes of construction, visualization, exploration of properties, elaboration of explanations and classifications, within others. Among more and better experiences we have, the conceptual image gets closer to the concept since Tall and Vinner state: “to acquire a concept means, to acquire a mechanism of construction and identification through what will be possible to identify and build all the examples of the concept, the same way as that is conceived from the mathematical community” (Tall and Vinner 1981). As far as various investigations about the subject (Grenier 1989; Jaime and Gutiérrez 1996; Pearman 1990) generally they put the manifest between the piagetian concept of conservation of length and of invariance due to a tight relation that could be saved (Jaime 1994).

In our study, we compare the socio-cultural aspects that provide prospective primary school teachers’ ways of dealing with geometric transformations, and analyses of prospective primary school teachers’ constructions of personal meanings of geometric transformations. The constructs “conceptual image” and “conceptual definition” (Tall and Vinner 1981) will be useful to us also to describe the status of the knowledge of an individual fellow in relation to a mathematical concept. It is referred to the mental entities that are introduced to distinguish the mathematical concepts formally defined and the cognitive concepts through which they are conceived. With the expression, “conceptual image describes that the cognitive structure is totally associated to a concept, which includes the mental images and associated processes and properties.” (Tall and Vinner 1981). We have been trying to prove the following basic role: formation of images of a concept that a person may have, experience and examples which have been seen or used either within a scholar and extra-scholar context. Frequently the examples are few and students convert them in prototypes. Jagoda and Swoboda (2011) studied the process of construction of the concept in rotation spotlighting that “recognition of a specific figure to figure position is only a static image of this relationship, not connected with the movement of one object onto the other”, which suits to our position proving the meaningful correspondence of geometrical transformation concept as a function of figure to figure, which is the basic level of knowledge about geometrical transformations.

A recent study concerning prospective teachers’ knowledge of isometric transformations (Yanik and Flores 2009) revealed that scholars i) - started by referring to transformations as undefined motions of a single object, which is equivalent to Static Arrangement Figure To Figure (Swoboda), ii) - followed by using transformations as defined motions of a single object, and iii) - the understanding of transformations as defined motions of all points on the plane, which is equivalent to the Jagoda and Swoboda statement of geometrical transformations as function of set of points to set of points. Tall and Vinner (as quoted in Fischbein 1993) say, there are various mistaken conceptions among students as it concerns to the concept of the plan as a set of points. Primarily, we will show that in the process of construction of the concept of geometrical transformation in Spain it is seen as a change - function of a figure to another figure, while in Kosovo they take it as a function of a set of points (points to points).

## Research methodology

The methodology was adapted to several techniques that allow approaching the construction of the investigation goals and rating it as a theoretical comparative formal study within the interpretative focus. In this way, we have elaborated a design combined with the techniques of the comparative studies and all along with the ethnographic techniques and case studies. Considering our own experience in the mathematical formation of the teachers, we consider adults who acquire a professional scientific knowledge, and our work that has transformed a vision of the processes in creation of meaning, we identify the following: investigation, action and formation which are the three sides of the same methodological triangle. So, the investigation comprises theoretical component with an epistemological and multicultural comparative character, and an experimental type component. These two parts of the investigation are intimately related to giving product-analysis of speech and analysis of the personal constructions, just for the sake of forming the investigation conclusions. We consider two different contexts: Faculty of Education, University of Prishtina - Kosovo (FEUP), and Faculty of Teachers' Education, University of Barcelona - Spain (FTEUB). Participants were purposefully chosen based on criteria and voluntarily participated in this study. They are 18-22 years old students - prospective primary teachers. A previous curricular-cultural comparative analysis based on textbooks, official curricular proposals and teachers' training materials, showed deep differences among both previous preparatory and culturally different frameworks (Thaqi 2009), not detailed in this paper.

The results of a final semi structured questionnaire were the basic data considered in this paper. Data were collected from descriptive notes, reflective notes, interviews and video records. The collected data were analysed using constant comparison method described by Strauss and Corbin (1990) along with analytic induction. The qualitative case study is a selection taking into account the essential properties as: i) Descriptive - The end product of a case study is a rich “thick” description of the phenomenon under study; ii) Heuristic - Case Studies illuminate the reader's understanding of the phenomenon, which may provide the discovery of new meaning and extends the reader's experience, or confirm what is known; iii) Inductive - Case studies for the most part rely upon inductive reasoning on formulation of generalizations, concepts, or hypotheses from an examination of data (Straus and Corbin 1998). Such a questionnaire is the last step for a more wide developmental study in which both groups of students have the same training on transformations in geometry (Thaqi, Gimenez, and Rosich 2011).

The quantity of the practical sessions and their length is what we present in the following table: (see the main ideas in Table 1). Some other questions were added to identify reasoning and specific cultural elements about geometric transformations, ideas about teaching and learning, and about their thinking on future classrooms as far as geometrical transformations are concerned.

The students entered the final test after they had taken training courses on how to teach geometric transformations in schools, during the course of the spring semester 2009. The students were given the questionnaire the last day of the course, and all of them responded to the questionnaire. The issue in focus was identification of the prospective teachers' concept images and the way they used their images and the mathematical definition of certain concepts on geometric transformations that they would find crucial at the beginning of their professional life as mathematics' teachers. The selection of the questions in the questionnaire is closely related to fulfilment the five sessions of didactics practice on learning how to teach geometric transformations. All of this was dedicated to both groups of students - in Pristina and Barcelona.

The students were asked to give an explanation to the following aspects: terminology and type of transformations, properties and relations on transformations, processes of changes, and other aspects about geometric transformations as reasoning, teaching, attitude, etc. Firstly, we have established the problems how to carry out a selection of activities, classifying them, and finally we have presented our investigation to the participants in both faculties: FTEUB and FEUP. The activities have been implemented in usual classrooms of the correspondents' faculties of FEUP and FTEUB. In the group of FEUP there were 14 students of the 3rd grade in the program of primary education and in the FTEUB group there were 13 students of the 2nd grade in program of primary education.



Table 1. Sets of questions related to mathematical ideas about transformations

Aspect of meaning of geometric transformation	Identified Activities
1. Isometrics and the everyday life (SI)	1.1. Presentation: An experience about isometric transformations (SIP) .1. Presentación: “Una experiencia sobre isometrías” - (SIP)
	1.2. The activities about the isometric transformations (SIA)
	1.3. Didactical activity: Presentation in video of a primary class (in Kosovo) about symmetry. (SID)
2. Learning the usage and the value of the sources to teach the transformations (SR)	2.1. Presentation: Scientific article as a resource in teacher education (SRP)
	2.2. Specific activities about didactical resources and geometrical transformations (SRA)
3. Projections and shadow (SP)	3.1. Recognition of class work about shadow in the school (SPP)
	3.2. Properties of shadow (SPA)
4. Reasoning, proving and justification of geometrical transformations (SA)	4.1. Presentation of topic (SAP)
	4.2. Activities about reasoning, proving and justification of geometrical transformations (SAA)

## Findings

From the analysis of the curricular elements of the future primary teachers in Spain (Barcelona) and Kosova in the geometrical area, and especially in the treatment of the geometrical transformations, we have identified the social-cultural aspects that interfere in the formation of prospective teachers of Primary School in both countries. Also we have analysed the context of the investigation on the facts that determine the process of learning to teach the geometrical transformations in Primary school; at the same time we have studied the elements of education, like the educative system in countries, the curricula, the text books and teachers’ formation at primary school as well. We have already presented the analysis of the moments of the process of prospective teachers in the process of building the idea of geometrical transformation.

In the analysis of the context (Thaqi 2009) we have seen that the Program of Geometry in FEUP (Kosovo) is about the formative teaching. The study of geometry in this program has its primary goal to reinforce mathematical knowledge based on qualified posture as formalist in order to be understood as “the rules forming some logical affirmations follow some others”.

In the study program dedicated to teachers’ education of the FTEUB (EDUMAT - Mathematics and its Didactic for teachers - Godino and Ruiz 2003), we have seen the informal knowledge in the teaching of transformation. The formation and the structuring of mathematical knowledge as a deductive system does not have to be the starting point, but the goal of a large process of approaching the construction reality of intellectual instruments that are allowed to be interpreted, represented, analysed, explained and predict certain aspects of reality.

Few students of FEUP talk explicitly about the isometry as a set of transformations that conserve the size and shape. Instead, they do identify the simetry, rotations and translations as transformation of such a property. However, in some cases, the activity makes the intuitive go ahead the structured knowledge. As such, when we observe embroidery, some students show rotation as a unique isometry, since they identify it as the only transformation acting on the marked module. So, the conceptual image of the geometrical transformation is built based on visual properties (transform=deform), and movement (isometric=displacement). Firstly, let’s say that in some cases the transformation is seen as a map (function) of a set of the other one, but that function isn’t identified between the positions of the objects in two different places. This can be explained with the symmetric figures, because it easily establishes the correspondence between the two parts

of the figure or object. Instead, in terms of other types of transformations, they have to imagine the initial and final position of the transformed figure in order to be able to establish the idea of transformation as map (function).

We got convinced that it's that way when we analysed the answer of the problem where there is asked to explain the transformation of the figure A in the figure B - when student Ad explains it using transformation of set of points of the figure A on the correspondent points of the figure B.

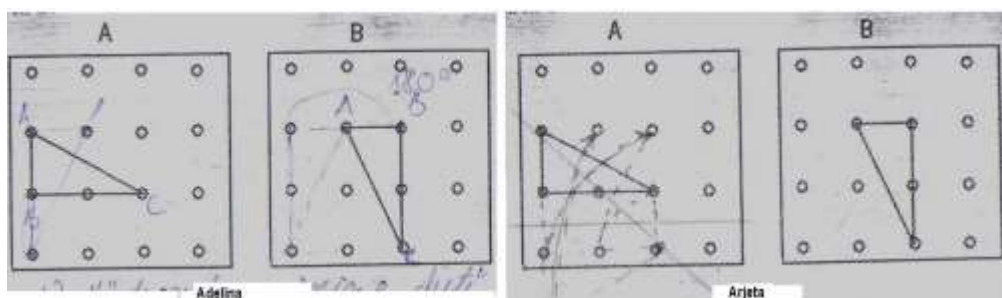
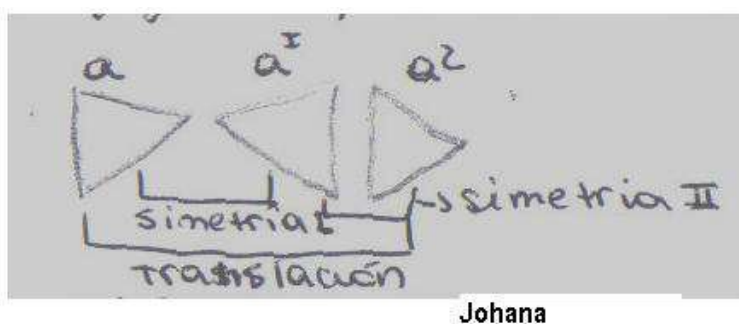


Figure 1. Explain the transformation of the figure A in the figure B

In the problems 5B (explanation of transforming triangle A in the triangle B) the same student finds it difficult to explain the relationship between the figure A and the geometrical process in both mathematically and in precise sense. In reality, he/she does not succeed to precise the angle of rotation, around what point or axle, etc. Actually, as the fig. 1 shows, he/she feels a need of naming the vertices of the triangle, and later on, he/she expresses the functional dependence of other positions of the same ones: “... firstly there has been a displacement of the point A, and during the movement of the point A, the point B and C get the position as presented in the following figure...” (Ad, p12:7-8). Respectively, this way is constructed the idea of rotation as a mapping of three points in other three points under the condition: “... so the point C has gone out of the column of the point A one row lower, the point B has gone on point's A place”. (ad, p12:10).

In the FFPUB, only one student talks about isometry as a transformation that conserves the shape and size while the others identify it as repetitions (Figure 2).



Johana

Figure 2. Explanation of translation as a function of object to another object by Johana

The second step of this process is to indicate the axial symmetry with the axis of the symmetry instead of the mirror. “...we would see it better if we would imagine a mirror placed in the column of the point A, where the point A is not reflected (moved) but instead, the points B and C are reflected.” (ad p12:11).

Only in one case in the FEUP they identify the similarity as a functional dependence, through the conical intersections (Figure 3. - Vjollca).

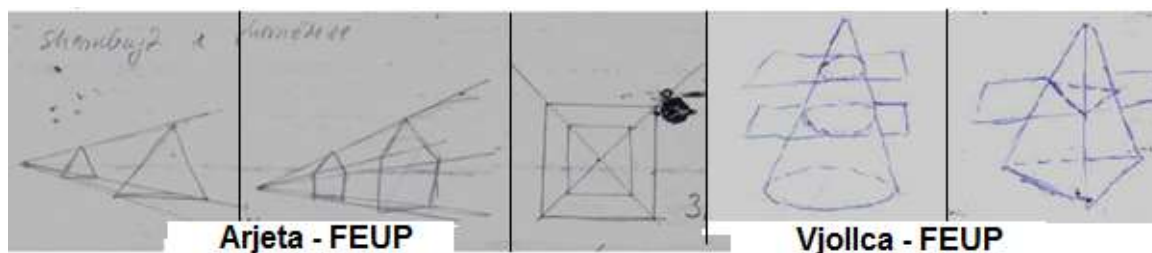


Figure 3. Explanation of similarity as a functional dependence by Arjeta and Vjollca

The finding of activities about the deformations is evident now. The activity SAA5 shows the dynamic transformation of a triangle - two stable vertexes and the third one move horizontally inside a segment (Figure 4). The students have to explain the property that is observed in this transformation.

It is the transformation with the property of invariance of the surface and the variance (change) of angles and the sides of the triangle. It is in our interest that students first identify these properties and then justify the announced result.

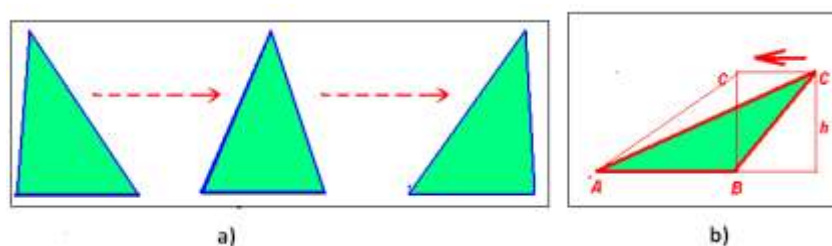


Figure 4. Transformation with the property of invariance of the surface

We have identified that student-Ad identifies correctly the elements of the triangle that changes and the elements that do not change. The student identifies the change of the shape, perimeter, position and what does not change like surface, base of the triangle and the height of the triangle. As an illustration we show the part of the dialogue with Ad, who does a correct justification showing that the surface of the triangle does not change using the correct symbolization ( $S = \frac{bH}{2}$ ) based on the definition of the surface of triangle as a product of the base and the height. (Figure 4 b):

“Ad: The triangle gets converted in a rectangle triangle...

Docent: What does change in this process? What does not?

Ad: The height of the triangle changes.

Docent: What other changes do we have?

Ad: The angles and the sides change and, the surface and height do not.

Docent: How can you argue that the surface does not change?

Ad: The surface of the triangle is a function of the base and the height. As it is said, neither the base and nor the height change, ... so the surface is constant independently of the position of the upper vertex.”.

With the development of this and of the other activity, we identify that the dynamic presentation of a deformation makes possible the students approach to recognize and build the concept of geometrical transformations as a function of variables and constants ( $S = \frac{bH}{2}$ ) this is to identify the elements of deformation that are conserved and variables as well.

We will continue elaborating the process of the transformation in future for sure. We are dealing with the activity SRA3. In this activity it is asked to draw a symmetric image of the figure, having as a symmetric axis the straight line drawn (activity SRA3). The students have mirrors as didactic resource for their activity. We haven't noticed in the observation that any of the students did not succeed to reproduce the symmetric figure from the given one. In the video recordings, we find as important to describe the process of reproduction for some students. Before student-Ad

started to do the construction of the symmetric figure he/she gives the comment:

“Docent: You can explain the process of the construction of the symmetric figure...”

Ad: I draw any figure in the plot of points. Later I draw a straight line in that way that touches one vertex of the given figure. After that, I count that the straight line has to be the axis of the symmetry. Is it so?

Docent: Yes, yes...

Ad: I know that the distances of the points have to be the same to the axis. This means that I do an application to each vertex of the figure counting little squares on the other side of the axle...” (SRA 3).

Student Ad does the symmetry using the properties of the symmetry: the axis, the same distances to the axis and the process of the mapping point-by-point.

It is not needed to determine each point of the figure, she finds the vertexes of the figure and later on, she uses the property of the aligned points: aligned points get transformed in aligned points. (Figure 5a).

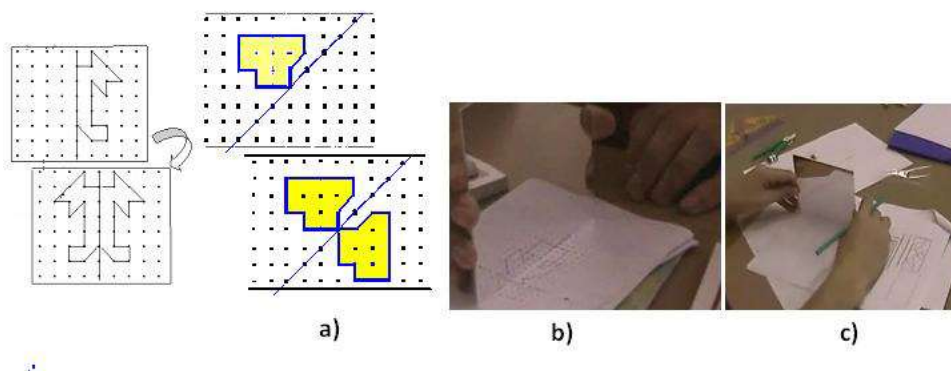


Figure 5. Draw a symmetric image of the figure, having as an axis the straight line drawn

Since students have in possession mirrors, the docent teaches them that, the result of the construction can be verified with the mirror (Figure 5.b). It is interesting the reaction of Ad:

“I think that it is not needed the mirror to verify if I have built correctly the symmetric figure... I “count” little squares and with that fact I can confirm if it is correct or not... later I enclose the correspondent points and I reach the symmetric image.” (Ad, SRA3 paragraph 12).

High grade students recognize the transformation if they recognize the relevant elements of TG using the process of the function (mapping) point-by-point, and the property of the aligned points: aligned points get transformed in aligned points.

## Conclusions and implications for teacher education

Comparing study programs for teacher education in both countries, we can say that in the program of EDUMAT the main goal of teaching geometrical transformation is the informative knowledge, while the geometrical program of FEUP (Kosova), goes for the formative teaching, intended to cultivate and practice the logical reasoning. The formal tradition of studying geometry from a Euclidean point of view (with some non-Euclidean observations) in the Eastern Europe countries, respectively in Kosovo, geometry has a bigger relevance to the mathematical content when it is treated by the teachers. We consider that none of the two extremes is good for an equilibrating formation between thinking and acting, or between the cultivated knowledge and practical knowledge. A good teaching must balance properly both forms of the mathematics, pure and applied. Both formations centers plan teachers to play a realistic role in future to deal with projections, shadows and deformations. In the formation of the teachers in Kosovo dominates preoccupation more in mathematics than in didactic-professional. Difficulties to overcome mathematical knowledge in general and geometrical ones in particular are multiple and diverse. The analysis that is done in both countries agree with the low mathematical levels of the students who enroll Faculty, and they also agree with the fact that approach to geometry does not improve. When we compare academic formation of primary teachers in these countries, we find out that

while in Spain the geometrical transformation is considered as a change (function) of the figure to another figure, in Kosovo it is considered as a change (function) of a set of points. While in Spain is notable using and handling different didactical materials, in Kosova is common using of drawing instruments (ruler, compass). About cultural aspects we find that in Spain there is a usual working team of students and teacher, in Kosovo, it is preferable individual work. In general, we find common characteristics about teaching geometrical transformations in the primary classes: identification of the properties - in a known context, construction of the concept - principal activity, verification and deepening of the knowledge - final activity.

## References

- Fischbein, E. 1993. “The theory of figural concepts”. *Educational Studies in Mathematics* 24 (2): 139-162.
- Godino, J., and F. Ruíz. 2002. *Geometría y su didáctica para maestros*. Granada: ReproDigital.
- Grenier, D. 1989. “*Construction et etude du fonctionnement d’un processus d’enseignement sur la symetrie orthogonale*”, 6th University J. Fourier, Grenoble, France.
- Harper, J. 2003. “Enhancing elementary pre-service teachers’ knowledge of geometric transformations through the use of dynamic geometry computer software.” In C. Crawford et al. eds. *Proceedings of Society for Information Technology & Teacher Education International Conference 2003*. Chesapeake: VA: AACE.
- Jagoda, E., and E. Swoboda. 2011. “Static and dynamic approach to forming the the concept of rotation”. *Proceedings of the Seventh Congress of the European Society for Research in Mathematics Education*, Rzeszow, 2011.
- Jaime, A., 1994. “*Aportaciones a la interpretación y aplicación del modelo de Van Hiele: La enseñanza de las isometrías del plano. La evaluación del nivel de Razonamiento*”, PhD diss., Universidad de Valencia.
- Jaime, A., and A. Gutiérrez, A. 1996. “Guidelines for teaching plane isometries in secondary school” *The Mathematics Teacher* 88(7): 591-597.
- Pearman, D. 1990. “Transformation Geometry and youg Children.” *Currículum* 1(1).
- Piaget, J. 1970. *Introducción a la epistemología genética. El pensamiento matemático*. Buenos Aires: Paidos.
- Sowder, L. 1996. “Classifying processes of proving”. In *Proceedings of the 20th Conference of the International Group for the Psychology of Mathematics Education*, vol. 3, edited by L. Puig and A. Gutiérrez. eds., 59- 65. Valencia.
- Strauss, A., and J. Corbin. 1998. *Basics of qualitative research: techniques and procedures for developing grounded theory*, 2nd ed. Thousand Oaks, CA: Sage.
- Tall, D. and S. Vinner. 1981. “Concept image and concept definition in mathematics, with special reference to limits and continuity.” *Educational Studies in Mathematics* 12: 151-169.
- Thaqi, X. 2009. “Aprender a enseñar transformaciones geométricas en primaria desde una perspectiva cultural.” PhD diss., University of Barcelona.
- Thaqi, X., J. Gimenez, and N. Rosich, 2011. “Geometrical transformation as viewed by prospective teahers”. *Proceedings of the Seventh Congress of the European Society for Research in Mathematics Education*, Rzeszow, 2011.
- Vygotsky, L. 1987. *Pensamiento y lenguaje*. Barcelona: Paidos.
- Yanik, H. and A., Flores. 2009. “Understanding rigid geometric transformations: Jeff’s learning path for translation.” *The Journal of Mathematical Behavior* 28 (1): 41-57.

[Back to contents](#)

## Who have I become? Transition of teachers’ identities through student-to-teacher violations

*Børge Skåland*

*Oslo and Akershus University College of Applied Science, Norway*

borge.skaland@hioa.no

### Abstract

The study studies whether teachers exposed to student-to-teacher violations experience transformations in how they view themselves and their surroundings following their exposure. Fourteen teachers are interviewed in a small-scale study on Norwegian teachers. Empirical data indicate aspects of teachers undergoing changes in how they recognize themselves, influenced by violations by students. Interpretative Phenomenological Analyses (IPA) is utilized as a research approach to detect teachers’ transformations.

**Keywords:** violation; transformation; student-to-teacher violence; recognition; identity; self-understanding

### Context of the research

The aim of this study is to present in-depth descriptions of what meaning teachers give to the phenomenon of student-to-teacher violation. This paper is based upon a small-scale study identifying how student-to-teacher violation affects teachers. There are indications in the data that teachers’ experiences of violations from students could lead to a new and changed understanding of themselves, both professionally and personally. Several studies on student-to teacher violation use quantitative methods, mapping the percentage of teachers exposed to violations (ATL 2012; Chen and Astor 2009; Christiansen and Larsen 2007; Dzuka and Dalbert 2007; Eggen 2010; Gerberich et al. 2011; Khoury-Kassabri, Astor, and Benbenishty 2009; Lärarnas Riksforbund 2008; Paton 2011; Reddy et al. 2013; Robers, Zhang, Truman, and Snyder 2012; Wilson, Douglas, and Lyon 2011). A Czech PhD-study found 1.6% of the teachers were violated within the preceding academic year (Tomášek 2008), while a US study found 80% of teachers victimized within the last 12 months (Espelage et al. 2013, 76). A Canadian study addressed the consequences of violence directed towards teachers (Wilson et al. 2011). They found student-to-teacher violations affected the following areas: teaching ability (86.3%), emotional/psychological effects (84%), physical effects (60.8%) (2011, 2360). The experience of transformation of teachers’ identities relates to Wilson’s category of emotional and psychological effects. This study adds to literature of teachers’ experiences of violations from students. The latest survey from the US, Statistics “Indicators of School Crime and Safety:2013” (Truman 2014) shows 3% of teachers in secondary schools and 8% in elementary school experience physical violence. Nine per cent of teachers in elementary schools and 10% in secondary education had experienced threats during the same period of time (Truman p. v). For Norway, 7% of the teachers working at elementary and secondary schools were exposed to violence during the twelve months in 2013 and 3% were threatened in a serious way that made them anxious (Statistics 2014). There were no changes from the Norwegian 2009 figures (Statistic 2009) while the latest US figures show a slight increase after years of improving (Robers, Zhang, and Truman 2010; Truman 2014). It is essential to look into the working life of teachers regarding the theme of violation. The concept “violation” instead of violence is preferred focusing on the receiver of an intimidating act. As researcher on many reports on school violence Benbenishty, states, “surprisingly little research” (Reshef 2013) is done on how teachers are coping. This study will focus on how violations alter teachers’ experiences of who they perceive themselves to be.

## Research question

This study aims at answering to the following research question: How do teachers experience student-to-teacher violations in light of transformation?

## Theoretical framework

Mead, Honneth, and Goffman (Park) constitute theoretical anchoring to the phenomenon under investigation. Wadel and Rots, Kelchtermans, and Aelterman add to the theories above. Mead argues that we are dependent on others for experiencing who we are. “The Individual experiences himself ... from the generalized standpoint of the social group as a whole to which he belongs” (1934, 138). Mead states that the “me” is more than a reflection of stimulations from others but “...there is then another “me” criticizing, approving and suggesting and consciously planning, i.e., the reflective self” (Mead 1964, 145). Moira Von Wright writes when interpreting Mead that the self is subject to change and dependent on social interactional structures (Wright 2000, 137). This is relevant when focusing on how teachers are subject to scrutiny.

Honneth uses a concept of transformation when describing what happens to persons exposed to violations. He uses the expression “breakdown” (Honneth 1995, 133) by giving examples of how rape and torture may have wide-ranging effects. This small scale study indicates that violations perceived as being of a lower level of severity, like punches, kicks and threats may lead to similar alterations in violated teachers; “...destroying the most fundamental form of practical relation-to-self, namely, one’s underlying trust in oneself.” (Honneth 1995, 133). “Destroying”, the concept used by Honneth is signifying a rather radical alteration transformation of an object or a person as I understand what it means to “destroy”.

Goffman presents life-world as a place where persons acting on a scene (Goffman 1959). He refers to Park when mentioning that the word person originally means “mask” and claims that the masks are who we are (Park in Goffman 1959). Park claims we play roles as “...parents and children, masters and servants, teachers and students, clients and professional men, Gentiles and Jews. It is in these rôles that we know each other; it is in these roles that we know ourselves” (Park 1950, 249). Goffman refers to “incidents” or “disruptions” when something occurs where the reality an actor performs to an audience, is threatened (1959, 206). Goffman states that reality is fragile and can be shattered “by very minor mishaps” (Goffman, 1959, 63) My study indicate that threats and violations from students is a “major mishap” in teachers’ life worlds, influencing their professional and personal sphere and identity.

Rots, Kelchtermans, and Aelterman (2012) replace “identity” with “self-understanding” in their study on novice teachers, focusing on identity as not something static, but an ongoing dynamic process that is the basis of how novice teachers view themselves. The authors states that a teacher is engaged in “the ongoing process of making sense of one’s experiences and their impact on the “self” (Rots, Kelchtermans, and Aelterman 2012, 2). The study shows how the understanding of the self is a continuous process, where interaction with actors in the working environment affects the perception of who they are, relevant alike for novice and senior teachers. Their study finds self-esteem linked to the emotional part of the teaching work (Rots et al. 2012), pertinent to this small-scale study consisting of highly experienced teachers in their sixties to newly certified teachers in their twenties.

Wadel introduces in 1973 the concept “reservoir of self-esteem” based on his study on how unemployed manage to uphold a positive self-image (Wadel 1973; Wadel, Wadel, and Fuglestad 2014). The risk of losing positive self-esteem can be detected in the original field-study by Wadel, presented and elaborated on in the two books mentioned study.

## Research methodology

### *Participants*

A group of fifteen teachers was chosen by snowball sampling (Creswell 2013, 158). The



sampling approach “identifies cases of interest from people who know people who know what cases are information rich” (158). All teachers agreed to the interviewing. The interviews were undertaken at various locations: *Cafés* (6), at their schools (5) in private cabin (2) and one interview took place at a teacher’s home (1). The first interviews were done without audiotape but with the interviewer taking notes and later writing the notes into a coherent text. The second round of the interviews were done via audiotape, and then transcribed.

The Norwegian Social Science Data Service (NSD) provided the necessary permission to perform the study. All participants gave written consent and proofread the transcribed interviews. All but one of the original fifteen teachers interviewed gave their consent, leaving the final sample of fourteen teachers.

Each of the teachers mentioned in this paper has been given a fictitious name, displaying their gender in both English and Norwegian. All of them hold a qualifying teaching certificate. The gender balance across the participants was equal. Seven of the fourteen teachers were exposed to physical assaults, seven were threatened. Eight of the fourteen teachers had had various lengths of sick leave.

Eight of the interviewed teachers taught in secondary schools, five of them in elementary school and one in lower secondary school. The age of the students does not appear in this study as it was not integral to the teacher’s experiences of being violated. This is in accordance with a study on Teachers Relatedness With Students finding there were no difference in relatedness between elementary and secondary teachers (Klassen, Perry, and Frenzel 2012, 156).

Interpretative Phenomenological Approach (IPA) emphasizes the researcher’s active role as interpreter in dealing with the data. “For IPA, analyses always involves interpretation” (Smith, Larkin, and Flowers 2009, 35).

Each interview was read several times. The aim was to gain “a holistic picture of the participant’s account” (Bramley and Eatough 2005, 226). Words that gave meaning were notes in the margin, aiming at trying to find conceptual themes which captured the interviewees’ most essential experience. Concepts were noted in the margin on the other side of the page. Themes were thus identified, and again categorized in sub-themes and superordinate themes. After each interview was analysed, the themes and subthemes were compared trying to find overall themes identifying most of the interviews.

In IPA semi-structured interviews are recommended based on reasons provided by Smith, Larkin, and Flowers: “Used effectively and sensitively, semi-structured interviews can facilitate rapport and empathy, and permit great flexibility of coverage. As a result, they do tend to produce rich and interesting data” (2009, 66). According to the authoritative Brinkman and Kvale (2014), semi-structured interviews are applicable when seeking “... to obtain descriptions of the life world of the interviewee with respect to interpreting the meaning of the described phenomena.” (Brinkmann and Kvale 2014, 150). The phenomenon in this study is student-to-teacher violations and the focus is of their description on how they have experience a transformation to take place.

## Findings

“What have I become” is a common experience described by many of the teachers interviewed in this study. A perception that an act of physical violence, threat or harassment had done something to them, had changed them somehow, is found in the data. Seven teachers are chosen to illustrate indications of transformation in how they perceive themselves following student-to-teacher violation.

Marion, in her late forties, was teaching special education class and experienced that “something had happened” to her after she had been punched in her face by a 12-year-old student in a special education. Her experience of transformation is noticeable in some of her descriptions of the episode. “I almost got into a psychological victim role where one experiences guilt and keeps on actively in an educator role where I/we trivialize what really is taken place.”

She describes a perceived risk to transform from “a teacher in control” into “a victim role”. This experience of change, that an episode of violence could do something to her, is strengthened



by her statement that “I am very certain it is very harmful to my soul” with pressure on each words. (In Norwegian: *veldig skadelig for sjelen*).

In a third statement, she asks for someone who could have guided her to understand what the episode had done to her: “I just wanted a kind of route finder, because one so easily loses face. Together with a professional, I would wind up. Try to see what comes about. Someone who ought to have supervision skills.” Marion indicates uncertainty of what has happened to her, what kind of transformation she has undergone, by her quest for supervision.

Indications of transformation is detectable in the following statement: “Afraid that they (incidents of violations) should do something to you, that I would not work here anymore”, even though I know I’ve done a darned good job” (Marion). Fear for having changed so much that continuous work at the same school appears a threatening risk. Possible meaning is her perceiving that the incident has proven her an incompetent teacher, or that she fears the episode of physical violence has changed her into becoming less competent. Her affirmative statement of “even though I know I have done a darned good job” strengthens the latter reading.

Another notion of Marion’s experience of transformation is her statement that the experience of violations remains within and that you gradually change. “In addition you do not get it out. It builds layer upon layer”. What kind of alteration that takes place when an experience which is not vented or treated ‘builds layer upon layers’ is not specified. Though what becomes clear is her sense of vulnerability. ‘Layer upon layers’ indicates unpleasant sediments, memories, experiences become storied within; fearing they somehow will influence her thinking and emotions, or personality.

Erik is a violated teacher changing between a role of blurred identity displaying susceptibility while at the same time arguing for his ability as teacher. During the interview, he changes his position from a proficient teacher to placing himself in a victim role when asking himself (and possibly me) in the interview: “Is there something wrong with me since I do not receive the backing I think I am eligible for?”. A seventeen-year-old student threatened him, resulting in sick leave for several months.

In another place in the interview he compares himself to a lifeless vehicle that has received dents and changed its posture. “I feel as if I were a car, being run into.”. If it is a smaller dent or if it is a car which have been totally wrecked he compares himself to is not made clear. A car that has been involved in a collision loses value and might have its abilities of steering and braking affected.

Jenny is an experienced teacher in her late fifties. In a lesson where she asked a student to put away his mobile, another student, formerly expelled from another school because of violence, intervened. Although no direct threat was made, her experience of the episode was so traumatic that she chose to leave her classroom. She had a three days’ sick leave to recover, before returning to work. During those days, she went on long walks and reflected on the episode. One of her doubts about herself is whether she had dramatized, a notion strengthened by a staff member who had said he though she overreacted. She relates her reflections while going on her walks during her sick leave: “Am I a wimp?” The student had not pounded her. Moreover, he had not said precisely that he should strike. “Had I lost my head?” Jenny states in the interview, a question addressed both to herself and to the interviewer. The expression “lose your head” is the same in English and Norwegian and indicates loss of control.

She requires more support after incidents of violations. “There must be someone in management who is trained to show respect for a teacher who has ended up in such a situation. You become so weak and vulnerable after such incidents.” The word “become” point toward that an alteration has taken place. Jenny used the word “vulnerable” underlining the threat of transformation.

Use of metaphor is found in the interview. Jenny compares herself to a machine; “I felt as if I were a machine, not important to maintain”. The metaphor machine indicates loss of important human dimension of who she was, into a new and inhuman state.

Peter is a veteran teacher in his early sixties. A student threatened him, saying he would give him a fist’, positioning himself in a boxing position. In another episode, the same student

threatened him by writing in an assessment that “nothing would happen” to Peter if he only gave the student the requested grade. What followed afterwards made it worse when the student’s parents contacted the school, stating it was the teacher who was the problem, not their son.

This accusation was challenging to how he saw himself as a teacher, as illustrated below:

“I have not experienced anything like it. I have been a teacher for more than thirty years. (I) Have not experienced anything like that before. Both as a teacher in Norway and abroad. Nevertheless, it is the first time that I’ve had such a pupil. And now I have been teaching for some years, over thirty years, both here and (mentions countries abroad) , and never, the first time that I have experienced such a student. The same goes for his parents. Moreover, I know I am a good teacher. The parents have nothing to say anything about me. They have no background for that. Because I can obtain one thousand parents within a day who will sign a paper that I’ve done a good job for more than thirty years. That I can do. Yes, give me a little more than a day then, but I have no problem with obtaining one thousand parents who will sign. Do you know what I mean? “(Peter).

Julie. A seventeen-year-old student threatened that “something would happen” if she did not give him a passing grade, even when submitting an incomplete test. The incident somehow transformed her from a secure person to one with great insecurity. The transformation was present in work situations, moreover affected her private life.

She tells of her new experience of being herself when spending nights alone in her home.

“Julie: I was really scared the first nights following the first episode, then, the first evenings I spent home alone. I was very frightened. I have heard about such incidents before, not necessarily school students, but previous jail birds and stuff, coming home to former prison wardens and yes, break into their house and [pause] yes [pause] yes.

I.Did you sit home waiting for? (Julie at this point interrupts)

Julie: No, I did not. However, I did not dare walk past the windows after dark and it stayed like this the first evenings. Because I had never been threatened before. Never experienced such threats earlier. No, then I was scared staying home at night. I was afraid of telephone threats and stuff like that and... [pause] Yes [pause] m m [pause].”.

Julie shows changes that have taken place in her life. She states that she has not before been threatened, that this is a new experience and that she as a consequence experience a transformation of how she perceive the world around her. The world in which she lives has from this episode on, become a dangerous place to reside. Even if the incident had taken place at school premises, her surroundings also at home has become transformed. Walking past the windows in her home is experienced differently afterward the issued threat.

Her working life as teacher has changed. She states: “I felt almost done as a teacher. Eha [pause].” When I followed up this statement by asking if she actually considered leaving the teaching profession, she answered: “Yes, I probably did so. Ehh. Everything else would have been better. Cleaning woman and everything else. (Laughter) [pause] Ehe Ehe. [pause]”. Julie’s transformation from feeling secure in her home into finding her home unsafe area to stay is evident. In the excerpt, Julie has clearly demonstrated her experience of lowered professional self-image as a teacher.

Ana. The most explicit statement of experiencing an alteration derives from Ana. A student in primary school, diagnosed with ADHD, kicked her in her temple during her first months as a newly certified teacher. She was diagnosed with Whiplash and is medically assessed to have 30% work capacity left. She quit her teaching job after a period of struggle and started an alternative career. Ana states that what happened not only affected her career as teacher but also her private life, even her marriage. “I was afterwards not the person my husband had married. We fought for our marriage however, and during our struggle, I became pregnant, and gave birth to a daughter.”.

Walter quit his work as a teacher shortly after the incident of physical violence. He states; “I quit my job in order to get away”. He adds: “The reason why I quit the job, is the way it was handled”. It is not an act of violence that lead to him leaving the profession, but lack of support afterwards. Walter reacted strongly emotionally after experiencing a violent attack from a twelve year-old-student. When reaching home he experienced losing control and stated hyperventilation. He contacted the Medical Emergency Clinique and ended with several weeks of sick leave.

## Discussion

According to IPA a theme or sub-theme has to be identified in half of the participants. Above are listed descriptions from half of the teachers interviewed on how they experienced that a transformation either had taken place, or they were afraid it could take place, in connection with student to teacher violations.

The overall theme across the data is transformation. Seven teachers perceptions of change have been presented to support this overall theme. Focus is the meaning the teachers attribute to what has taken place. Their meaning of the episodes represents an interpretation on their behalf, and in Interpretative Phenomenological Approach, IPA, the researcher is making meaning of their meaning. Smith calls it the “double hermeneutic” meaning the participant is making sense of experiencing the phenomenon under scrutiny and the researcher is again making sense of the interviewee’s sense making. (Smith et al. 2009, 3, 35, 36, 80, 87). Biggerstaff and Thomson describe the double hermeneutic process as “the meanings an individual ascribes to events are of central concern but only accessible through an interpretative process.” (2008, 215). The researcher is in this process allowed an active interpreter role when engaging with the text that is the interview transcripts.

In the ideographic analyses of the transcript, an important finding is that not only have violations from students affected the teachers interviewed, but a notion of transformation emerges from the material. According to the Interpretative Phenomenological Approach, the experience itself and the meaning people attach to the experience is central to investigate.

Marion, the first teacher mentioned above, reflects on how her experience from being punched in her face made her change from a teacher role to “almost” a victim role. Role is a concept used by Park (1950). Park studied how “The Jew” when coming out of the ghetto changes and “He loses his characteristic type” (247). The student who has punched Marion’s face seems have caused a loss to Marion’s meaning of who she is, or self-understanding or is risking to become. Therefore, she states that she has not transferred into a victim, only “almost”.

This study indicates that the teacher’s role changes after violation incidents. The role from having full control to experiencing loss of control after threats, physical attacks and harassment is what Marion and several of the other teachers also identify (Walter, Peter, Ana, David, and Adam).

Erik who was threatened by a student that he would end up in hospital if they met outside school premises, changed to a new school. He experienced that his union representative and the local school safety officer went against him. He related that the local union representative asked “What do you want?” when he asked his union to stand up for him.

Looking at the three levels of given meaning to the phenomenon under scrutiny; social comparison represents the first level. Erik states that “contact with colleagues meant a lot during my sick leave”. He gave the contact the meaning that his colleagues were there for him, standing up for him, that he was a part of a larger group. This is according to James who states that club-opinion is of vast importance in self-evaluation (James, 1990, 1890).

A second level in IPA-analyses is identifying metaphors. Erik uses a lifeless metaphor to describe his transformation. “I experienced as if I were a car, being run into.” When you use the expression “run into” it produces a different image than scratch or bruised. A car that has been run into, often is unable to be driven any further. Moreover, often extensive repair work has to be performed in order to get the car on the road again. The metaphor brings forward a picture of a changed and damaged vehicle. Like a damaged car, Erik expresses a need for “repair”, for being rebuilt, for returning from the workshop seemingly untarnished.

Smith (2009) mentions a third level of analysis involving looking at language tense and word use. We detect an anger towards Erik’s nearest support resources while praising more distant support systems, like doctor, police and state prosecutor. A comparison between the two categories is to be found in the words he uses when describing them. He describes the follow up he was awarded as “a parody” (same word in the Norwegian language: “parodi”) and states that the way he was treated by both his local union representative and the administration as “shitty”. (Norwegian: *bedritent*) “It was a parody of follow-up. The routines are written, but no one knows how to follow them”, Erik argues.

When describing the assistance he had received from his nearest team of colleagues, his doctor and the police prosecutor he uses words with a positive connotation. He describes his meeting with the police: “they were exceptionally accommodating and professional.” Similarly, he describes his doctor to be “the decisive element in my rehabilitation. For me, the doctor functioned as a therapist” (Erik). The meaning he gives outside professionals appears to play an important role in obtaining an upgraded self- understanding.

Jenny like Erik above uses a metaphor describing her lowered self-esteem when stating she felt like a machine, not needing maintenance. The metaphor might symbolize the depersonalization the process of being threatened, afterwards not being supported, as inhuman. This non-human image is strengthened by her comparing herself to a machine. According to Brinkman and Kvale, a metaphor “is richer, more complete, than a simple description of data” (2014, 323). A metaphor “dramatize, amplify and depict” (Miles and Huberman cited in Brinkmann and Kvale 2014, 322-323).

The comparison with a machine point to a state of “depersonalization” as described in a study on workplace aggression (Winstanley and Hales 2015). The risk to change from a caring teacher as described in the study “Caring about Caring” (Aspfors and Bondas 2013) finding the relational dimension pivotal to the teaching profession to a “callous, dehumanized and depersonalized” (Taris, Le Blanc, Schaufeli, and Schreurs in Winstanley and Hales, 2015) role appears to exist in this small-scale study.

Peter offers to present signatures from one thousand parents who will withstand his experienced threat of becoming shrunk into a less knowledgeable teacher. He fights for his reputation, his recognition, of being valued as a capable teacher. Two incidents of violation and the following reactions from the student’s parents had put his unwavering description of himself as skilled teacher at risk.

Peter experiences that the threatening student and his parents are trying to reduce him from a competent teacher to an incompetent teacher, an alteration he refuse to accept. Honneth states that “...to be able to acquire an undistorted relation-to-self, human subjects always need - over and above the experience of affectionate care and legal recognition - a form of social esteem that allows them to relate positively to their concrete traits and abilities” (Honneth 1995, 121). When parents present him negatively, he reacts strongly and uses various strategies to regain a positive “relation-to-self”.

One recourse he addresses in the interview is his seniority of teaching. This is similar to findings by Wadel (1973, 1991; Wadel et al. 2014) where “George”, an unemployed worker, often refers to earlier work experience. Wadel names it “reservoir of self-esteem”, a source from where one boosts one’s self-image as a competent person.

Julie describes an altered situation, deriving from the information that she “has never been threatened before”. Julie’s transformation from feeling secure in her home into finding her home unsafe area to stay is evident. Julie experience of lowered professional self-image as teacher is seen from the excerpts. Her changed self-understanding (Rots et al. 2012) influenced both her private world, sitting home at night and feeling afraid, and her professional world where she states she “felt almost done as a teacher”. As recommended by the IPA approach, social comparison is vital in order to give an experience meaning. Julie is comparing her professional role with a “cleaning lady”, stating that everything would be better that continuing as a teacher. Comparing herself with a cleaning lady appears as an indication of a transformed and reduced professional “self-understanding” Julie uses a cleaning woman when comparing herself to other trades which she was thinking of could be suitable work for her. A “cleaning woman” in the public eye is not associated with high education and a difficult job to get. This indicates an altered professional “self-understanding” (Rots et al. 2012). This brings about an image of reduced and changed professional self-confidence.

Ana states directly that she had become a transformed person by stating it from her husband’s perspective. She says she no longer was the person her spouse had married. The physical assault changed her life by also forcing her to start a new profession since she only had 30% work capacity following her neck injury. The rest of her school community were perceived unwilling to

acknowledge her situation, leading to alienation. Mead states that “failure to remain in a particular group may mean breakdown of the self” (Mead and Miller 1982, 164) Mead further states that “one cannot exist as a self without the universal, the group, that makes the self possible” (Mead and Miller 1982) Ana describes how she struggles to keep “the self”. She made a new “self possible” by fighting for her marriage and changing career track. That she in the midst of the tumult gave birth to her first child, allowing her to experiencing a new self.

Walter’s reaction upon reaching home can be called a “personal psychological earthquake” Lillevik and Øyen (2012, 70). An earthquake often transforms the landscape. It becomes evident that Walter experienced the school landscape differently before and after the episode of violence. He described his return to school after a leave of absence lasting four weeks and noted that “I still was not ready”. This can be understood to mean that Walter returned to work as a transformed teacher, not the same as he was before the incident. He states, “I experienced that I for the principal was perceived as a burden”. This is portrayed as a transformed position from how he experienced himself before the incident.

Honneth mentions certain dimensions when recognition is at stake. The “Practical relation-to-self” has to do with a “basic self-confidence” which again is closely linked to the concepts of “self-respect and self-esteem.”(Honneth 1995, 129) He also argues that recognition is at stake when people are shown “forms of disrespect”, “abuse and rape” together with “denial of rights, exclusion, denigration, insult”. A third dimension Honneth indicates is the “Threatened component” of personality and lists “personality physical integrity, social integrity” together with “honor and “dignity” (Honneth 1995, 129). As displayed in this paper, teachers exposed to student-to-teacher violations show through social comparison, through use of metaphors and through use of language and direct speech that their view of themselves as persons and teachers is transformed. The concepts listed by Honneth; dignity, honor, integrity, self-confidence, self-respect and self-esteem are vital aspects when causing transformation in teachers’ experiences of who they are or who they have become.

## **Conclusions and implications for teacher education**

As displayed by the examples above, teachers appear to experience transformation of personal and professional identity. In a study on the process of becoming a teacher, Rots et al. (2012) state that “teaching is never a neutral endeavor, but encompasses deeply held beliefs on the values and norms that make up good teaching. When these deeply held beliefs are questioned teachers feel that they themselves as a person are called into question” (Rots et al. 2012, 2). It appears it is both the personal and private dimension of who they are which is “called into question”.

Teachers’ exposure to experiencing a transformation of who they experience they are, are under threat and it seems to be just as relevant for experienced teachers as “teachers-in-becoming”. Skaalvik and Skaalvik’s find in their research, that the teaching profession is one of the most stressful ones (2011). Stress derived from pupils’ misbehavior leads to exhaustion, burnout and thoughts of seeking work outside schools. Ødegård (2014) argues that when new and unexpected situations arise in schools, teachers may experience a “total breakdown” (Ødegård 2014, 208). Edvard, a 60+ teacher in my study of fourteen Norwegian teachers was punched in the face, making him fall to the ground, uses the word “surprised” when asked to describe his emotions involved in the assault. This is similar to many of the other teachers in the group where the violation was unexpected. This fact implies that it is hard to plan and be in a state of preparedness.

The question of who they have become indicates vulnerability and loss of professional and personal security. This study shows that intimidated teachers question what has happened to them, and the results of this study show loss of self-confidence and a transformed and tarnished self-image of who they are, who they have become, what incidents of violations from students have caused in the way they experience themselves. Experiences of student-to-teacher violations place teachers in vulnerable positions where transformations of teachers’ self-understanding may occur. We have to increase awareness on this phenomenon in order to prepare and keep teachers inside

schools as a workplace.

Questions of work place violations in schools have to be addressed to a larger extent in teacher education. Research on how teachers experience violations from students must be focused in more studies, since extensive and relevant studies on what impact student-to-teacher violations has on teachers’ lives to a great extent is missing.

## References

- Aspfors, J., and T. Bondas. 2013. “Caring about caring: newly qualified teachers’ experiences of their relationships within the school community.” *Theory and Practice* 19 (3): 243-259. doi: 10.1080/13540602.2012.754158.
- ATL Association of Teachers and Lecturers. 2012. Survey on violence against teachers. Liverpool.
- Biggerstaff, D., and A. Thompson. 2008. “Interpretative phenomenological analysis (IPA): a qualitative methodology of choice in healthcare research.” *Qualitative Research in Psychology* 5 (3): 214-224. doi: 10.1080/14780880802314304.
- Bramley, N., and V. Eatough. 2005. “The experience of living with Parkinson’s disease.” *Psychology & Health* 20 (2): 223-235. doi: 10.1080/08870440412331296053.
- Brinkmann, S., and S. Kvale. 2014. *Interviews: learning the craft of qualitative research interviewing*. Thousand Oaks: Sage.
- Chen, J.-K., and R. Astor. 2009. “Students’ reports of violence against teachers in Taiwanese schools.” *Journal of School Violence* 8 (1): 2-17.
- Christiansen, J., and I. Larsen. 2007. *Lærervilivet på godt og ondt. Undersøgelse af psykisk arbejdsmiljø blandt medlemmer af Danmarks Lærereforening*. Copenhagen: Casa Centre for alternative social analysis.
- Creswell, J. 2013. *Qualitative inquiry and research design: choosing among five approaches*. Los Angeles: Sage.
- Dzuka, J. and C. Dalbert. 2007. “Student violence against teachers-teachers’ well-being and the belief in a just world.” *European Psychologist* 12 (4): 253-260.
- Eggen, J. 2010. *Vold i skolen: en kartlegging av vold mot lærere på barnetrinnet*. Oslo: J.H. Eggen.
- Espelage, D., E. Anderman, V. Brown, A. Jones, K. Lane, S. McMahon, and C. Reynolds. 2013. “Understanding and preventing violence directed against teachers.” *American Psychologist* 68 (2): 75-87. doi: 10.1037/a0031307
- Gerberich, S., N. Nachreiner, A. Ryan, T. Church, P. McGovern, M. Geisser, M., and E. Pinder. 2011. “Violence against educators: a population-based study.” *JOEM, Journal of Occupational and Environmental* 53 (3): 294-302.
- Goffman, E. 1959. *The presentation of self in everyday life*. New York: Doubleday.
- Honneth, A. 1995. *The struggle for recognition: the moral grammar of social conflicts*. Cambridge: Polity Press.
- James, W. (1990 [1890]). *The principles of psychology great books of the western world*, vol. 53. Chicago: Encyclopædia Britannica.
- Khoury-Kassabri, M., R. Astor, and R. Benbenishty. 2009. “Middle Eastern adolescents’ perpetration of school violence against peers and teachers: a cross-cultural and ecological analysis.” *Journal of Interpersonal Violence* 24 (1): 159-182.
- Klassen, R., N. Perry, and A. Frenzel. 2012. “Teachers’ relatedness with students: an underemphasized component of teachers’ basic psychological needs.” *Journal of Educational Psychology* 104 (1): 150-165. doi: 10.1037/a0026253.
- Lillevik, O., and L. Øien. 2012. *Tiltak mot vold og aggresjon i skolen: en håndbok om forebygging, håndtering og oppfølging*. Oslo: PEDLEX norsk skoleinformasjon.
- Lärarnas Riksförbundet. 2008. *Ingen skal behöva vara rädd i skolan*.

- Mead, G. 1964. *Selected writings*. Indianapolis: Bobbs-Merrill.
- Mead, G., and D. Miller. 1982. *The individual and the social self*. Chicago: Univ. of Chicago Press.
- Mead, G., and C. Morris. 1934. *Mind, self, and society: from the standpoint of a social behaviorist*. Chicago: Univ. of Chicago Press.
- Park, R. 1950. *Race and culture*. Glencoe, Ill.: The Free Press.
- Paton, G. 2011. “One-in-five teachers “physically attacked” at school, Education.” The telegraph.
- Reddy, L., D. Espelage, S. McMahon, E. Anderman, K. Lane, V., Brown, and J. Kanrich. 2013. “Violence against teachers: case studies from the APA task force.” *International Journal of School & Educational Psychology* 1 (4): 231-245. doi: 10.1080/21683603.2013.837019.
- Reshef, M. 2013. *Violence against teachers: the world is also coping with the phenomenon*. Walla News.
- Robers, S., J. Zhang, J., Truman, and T. Snyder. 2012. *Indicators of school crime and safety: 2011*. Washington, DC: National Center for Education Statistics, U.S. Office of Justice Programs, U.S. Dep. of Justice.
- Robers, S., J. Zhang, and J. Truman. 2010. *Indicators of school crime and safety*. Washington, DC: National Center for Education Statistics, U.S. Office of Justice Programs, U.S. Dep. of Justice.
- Rots, I., G. Kelchtermans, and A. Aelterman. 2012. “Learning (not) to become a teacher.” *Teaching and Teacher Education* 28(1): 1-10. doi: 10.1016/j.tate.2011.08.008.
- Skaalvik, E., and S. Skaalvik. 2011. “Teacher job satisfaction and motivation to leave the teaching profession: Relations with school context, feeling of belonging, and emotional exhaustion.” *Teaching and Teacher Education*, 27 (6): 1029-1038. doi: 10.1016/j.tate.2011.04.001.
- Smith, J., M. Larkin, and P. Flowers. 2009. *Interpretative phenomenological analysis: theory, method and research*. Los Angeles: SAGE.
- Statistic, N. 2009. *Working Environment*. Oslo: SSB.
- Statistics, N. 2014. *Levekårsundersøkelsen*.
- Tomášek, J. 2008. “A teacher as a victim of violence učitel jako oběť násilí.” PhD diss., Univerzita Karlova v Praze Charles University in Prague.
- Truman, J. 2014. *Indicators of School crime and safety, 2013*. United States of America.
- Wadel, C. 1973. *Now, whose fault is that?: the struggle for self-esteem in the face of chronic unemployment*, vol. 11. St. John’s, Nfld: Institute of Social and Economic Research, Memorial University of Newfoundland.
- Wadel, C. 1991. *Feltarbeid i egen kultur: en innføring i kvalitativt orientert samfunnsforskning*. Flekkefjord: SEEK.
- Wadel, C., C. Wadel, and O. Fuglestad. 2014. *Feltarbeid i egen kultur*. Oslo: Cappelen Damm Akademisk.
- Wilson, C., K. Douglas, and D. Lyon. 2011. “violence against teachers: prevalence and consequences.” *Journal of Interpersonal Violence* 26 (12): 2353-2371. doi: 10.1177/0886260510383027.
- Winstanley, S., and L. Hales. 2015. “A preliminary study of burnout in residential social workers experiencing workplace aggression: might it be cyclical?” *British Journal of Social Work* 45 (1): 24-33. doi: 10.1093/bjsw/bcu036.
- Wright, M. 2000. *Vad eller vem: en pedagogisk rekonstruktion av G.H. Meads teori om människors intersubjektivitet*. Daidalos, Göteborg.
- Ødegård, M. 2014. “Uro i skolen og den menneskelige væremåte.” *Norsk pedagogisk tidsskrift* 98 (03).

[Back to contents](#)

## **Initial teacher education: a comparative study of two European higher education institutions**

*Filomena Rodrigues & Maria João Mogarro*

*University of Lisbon, Portugal*

filomenarodrigues@campus.ul.pt & mjmogarro@ie.ulisboa.pt

### **Abstract**

Teacher education in Europe is characterized by a huge diversity of teacher education institutions. Different training contexts enact curricular differences. Using a qualitative research methodology of multiple case studies we intended to comprehend in what way curriculum, specifically practicum, influences the pedagogical and professional quality of student teachers. This study focuses on secondary student teachers of the field of natural sciences of two European higher Education institutions - the University of Lisbon and Malmö University - located in two countries - Portugal and Sweden, respectively - that have, according to OECD, significantly differentiated educational indicators. We were able to conclude that both teacher education programmes stimulate student teachers' reflexion and professional growth allowing the development of a solid support of knowledge and experiences, which contribute to the development of qualified teachers.

**Keywords:** initial teacher education; curriculum; practicum; science teaching.

### **Context of the research**

“A firm initial foundation is essential to equip new teachers with the knowledge, competences, skills, attitudes, awareness and confidence required to teach, to be pro-active and to manage change as professionals in a rapidly evolving environment.” (ETUCE 2008, 12).

Literature review shows that teacher education in Europe is characterized by a huge diversity of teacher education institutions. Despite this plethora the goal of teacher education is the same throughout Europe (Snoek and Žogla 2009) - train (competent) teachers. The variable is the training context (Flores 2011; Lopes and Pereira 2012), which can bear significant curricular differences. It is important to underline that the main differences occur in the distribution and duration of practicum. The creation of a European higher education space has been recently proposed by the Bologna Declaration. This educational space enables European cohesion by promoting coherence, consistency, competitiveness, attractiveness, mobility and employability (Decree-Law 42/2005). As a result most countries adapted their higher education programmes to a first and second cycle model (Snoek and Žogla 2009).

Knowing that Portugal and Sweden have, according to OECD (2012), differentiated literacy and schooling average levels, we have analysed the curricula of the initial teacher education (ITE) programmes in the field of sciences that provide teaching qualification for secondary education at two European higher education institutions: the University of Lisbon (UL), in Portugal, and Malmö University (MU), in Sweden. Using a comparative analysis we intended to comprehend in what way curriculum, specifically practicum, influences the pedagogical and professional quality of student teachers.

### **Research questions**

We have defined three research questions: (1) how do curricula and practicum of ITE programmes of natural sciences at UL and MU can be characterized? (2) What are the similarities and differences between these two curricula? (3) In what way do curricula and practicum of these ITE programmes influence professional and pedagogical quality of natural sciences' future teachers?



## **Theoretical framework**

School reality mirrors the global, multicultural and ever-changing characteristics of current society. Knowing that socioeconomic development of European societies depends on a knowledge economy (OECD 2012), the European Union highlights, in some of its documents (TNTEE 2000; CEC 2007; ETUCE 2008), the importance of ITE for training qualified professionals that have the necessary competencies (reflection and research capacity, among others) to teach in this reality. Thereby, ITE plays an important role in the (re)interpretation of personal values and experiences (Feiman-Nemser 2008; Alarcão and Tavares 2010), which occur both inside and outside the school context, allowing the creation of a teaching identity (Flores and Day 2006).

### ***Learning to teach: pedagogical and professional quality***

The quality of education and training of a population determines its country's economic and social development. Education plays a pivotal role in preparing individuals with the necessary knowledge, abilities and skills to actively participate in society (OECD 2012). Thus, only by investing in education and teacher education will be possible to build a socioeconomic competitive Europe.

Among other things, the quality of teaching depends on the quality of initial teacher education. If we want to analyse its quality, that is, if we want to verify if ITE fulfils its purpose - train competent teachers - we must analyse the curricula (and practicum) of the ITE programmes and ascertain its influence on pedagogical and professional quality. Pedagogical and professional quality, that is, the ability to be a good teacher and to teach properly depends on the relations that are established between knowledge, identity and emotions (Hobbs 2012). A good teacher, or an effective teacher, should behave as a chameleon, that is to say he/she should adapt his/her behaviours and his/her strategies to particular situations, contexts and audiences. This adaptability is not something that can be passed on, but instead it is something that will be developed throughout his/hers professional life. However, ITE plays an important role in the preparation of competent professionals, because it should induce student teachers to learn to teach.

Learning to teach is an ever-changing process, because it implies a continuous and permanent learning (Arends 1995). According to Montero, this process “entails the acquisition of a repertoire of knowledge, skills, attitudes, beliefs, and affections built throughout a teacher's professional practice in close relation with the diverse contexts in which it occurs” (2001, 165), that is, it comprises the development of a teaching identity. By restricting this concept to ITE we have decided to adopt the premise that learning to teach implies learning to think, know, feel, and act like a teacher (Feiman-Nemser 2008), i.e., it involves the creation of a foundation for professional knowledge and identity development, which will be established throughout the contact with professional practice (practicum in the case of ITE).

### ***Teaching identity***

The creation of an identity implies the construction of a “source of meaning and experience” (Pardal et al. 2009, 34). According to Rodgers and Scott (2008), and Sutherland, Howard and Markauskaite (2010), teaching identity is always being (re)built, hence it is not stable, modifying itself according to context(s) and relations that are established among educational stakeholders (teachers, students, parents, etc.). So, identity is a varied, multiple and complex construct (Day 2004). The professional identity of student teachers is developed from (Sutherland et al. 2010): (1) the images they have built while they were school students; (2) their beliefs about what it means to be a good teacher; and (3) the learning theories they study. According to Day (2004), identity depends on the knowledge the individual has of him/herself. This is an essential element to interpret, construct and perform his/her professional role. Therefore, initial professional identity is shaped by the interactions that can be established in educational contexts, and can be perfected and rebuilt over time from reflection processes (Flores 2011; Flores and Day 2006).

***Curriculum: concept definition***

Curriculum is a polysemic term. In educational context, curriculum can be seen as a system of interactions that is constituted by several subsystems, which are related between them (Lopes and Pereira 2012). According to Snoek and Žogla (2009), the social context of teacher education matches up to the system’s macro level; teacher education within each institution corresponds to the system’s meso level; and the interactions established within the classroom belong to the system’s micro level. A “learning plan” arises from the interactions that are established between these levels (Taba 1962, quoted in Gaspar and Roldão 2007, 22). Thus, curriculum can be understood as a structured and organized set of contents to be taught, goals to be attained, competencies to be developed, and strategies to be used, which depends on social standards, and encompasses the content to be learned and the contextualized formal, informal and hidden learning process (Pacheco 2001; Darling-Hammond et al. 2005). Therefore, this concept implies a balance between theoretical and practical learning.

***Practicum***

Considering the study’s focus, we believe it is important to emphasise the practical learning component of curriculum - practicum - defining it separately. Practicum is based on the concept of praxis, i.e., it involves the performance of a practical activity moored on theoretical learning (Hammerness et al. 2005; Alarcão and Tavares 2010). To this extent, the practical learning component is perceived as an instrument which enables the manifestation of theoretical instruction (Dewey 2008), that is, it comprehends the employment of scientific and pedagogical knowledge acquired throughout ITE enabling the development of a set of tools, which are necessary to the teaching practice. Dewey (2008) and Alarcão and Tavares (2010) have stated the following features as indispensable to teaching practice: (1) knowledge of classroom management techniques; and (2) mastery of teaching/learning strategies. These tools will enable the (future) teachers’ professional development from reflection and research (Ball and Cohen 1999). This notion encompasses the idea of “learning in and from practice” (Hammerness et al. 2005, 401) permitting, according to Tavares (1997), the development of scientific (know), pedagogical (know-how), and personal (being and belonging) competencies.

**Research methodology**

A qualitative research methodology of multiple case studies (Yin 2003) has been used in the empirical study. With this research we intended to: (1) characterize the curricula of the natural sciences’ ITE programmes of the UL and MU; (2) characterize the practicum of the natural sciences’ ITE programmes of the UL and MU; (3) compare both curricula regarding its structure and importance given to practicum; (4) characterize teaching/learning methodologies used in natural sciences’ ITE programmes of the UL and MU; (5) relate the curricula and practicum of the natural sciences’ ITE programmes with the development of the student teachers’ teaching identity; and (6) relate the curricula and practicum of the UL and MU programmes with the readiness of student teachers to enter the teaching profession.

The data were gathered during the months of March and April of 2013. The main data gathering instrument were semi-structured interviews. Considering the study’s objectives we interviewed the following educational stakeholders at each higher education institution: (1) secondary school sciences’ student teachers (one at UL and two at MU - one for lower secondary school and another for upper secondary school); (2) practicum supervisors (one at each institution); and (3) the coordinators of the ITE programmes (one at each institution). It is important to explain the discrepancy in the number of interviewed student teachers at each institution. Since the subject areas to be taught by those student teachers (upon graduation) were not exactly the same at both countries, it was not possible just to have Biology and Geology student teachers (which was the initial goal), due to the fact that Geology per se does not exist as a teaching subject in Sweden (the contents of this subject area are taught in other subject areas, such as Biology, Physics and

Geography - see the Swedish national secondary education curricula: Skolverket 2011), and also because during the data collection period there was not any ITE programme at MU whose major was in Biology. For this reason we have chosen, in Sweden, student teachers whose minors are in the field of physical and natural sciences, in this case Biology and Physics. The Portuguese student teacher had a major in Biology and a minor in Geology. Furthermore, we have also chosen two students from MU because of the specifics of the teaching specialization at this country. In Sweden there is a specialization to become a teacher in lower secondary school and another to become a teacher in upper secondary school, whereas in Portugal there is only one specialization which enables individuals to teach both lower and upper secondary education.

Six interview guides were made. These guides were similar in content but were adapted to the specificities of the stakeholders and teacher education programmes. Before conducting the interviews, the interview guides were duly validated by an external researcher in order to provide consistency to the study. All interviews were entirely transcribed and the transcriptions were sent to the interviewees for verification and approval.

Through documental analysis we were able to complement and triangulate some of the information gathered by interviews. Official internal and external documents were analysed, specifically legislation, statistics, information available on institutional websites, statutes and other internal documents that became important throughout the investigation.

Data categorization followed Bardin's (2011) and Krippendorff's (2011) ideas. For data analysis four domains were created based on data categorization. Two of these domains concerned the study's contextualization (teaching qualification's framework and ITE programmes' characterization). The other two domains regarded data's comparative analysis (comparison of the ITE programmes and relation between ITE and teaching profession).

The previous explanation of the research design and data analysis, and the data and methodological triangulation provides credibility to this study.

## **Findings**

As stated in the theoretical framework, one can analyse curricula by looking at the different educational systems' levels. In this text we do not approach the systems' micro level at its fullest. However, this level emerges because we have accessed the classroom, namely the professional and pedagogical quality of student teachers, through the speeches of the different educational stakeholders collected during the interviews. Also through data collected by interviews and through documental analysis we were able to analyse the systems' meso level by characterizing the ITE curricula. This meso analysis constitutes the focus of the present study. By analysing each country's legal documents we were able to comprehend the systems' macro level and develop a framework that enabled us to understand the legal requirements for an individual to become a teacher in Portugal and in Sweden. We will start with the latter and then we will work our way inwards towards the micro level. Our findings will be presented according to the established domains for data categorization. First, we will analyse the teaching qualification's framework and then we will characterize and compare both ITE programmes under study regarding curricula (and practicum). Afterwards, we will establish a relation between curricula, practicum, teaching identity, and professional and pedagogical quality.

### ***Required teaching qualification in Portugal and Sweden***

Nowadays, to be able to teach in Portugal one must have a Master's degree in teaching (Decree-Law 43/2007). According to this Decree-Law, if one wants to teach sciences in secondary school (both lower and upper secondary) one must have a teaching degree in one of the following sets of areas: (1) Biology and Geology; or (2) Chemistry and Physics. These sets of subject areas are already predetermined in legislation. We have focused our study in the Masters of Teaching in Biology and Geology (MTBG). To be able to be admitted to this Masters one has to possess a graduation with a major and a minor in each subject areas, for example: a major in Biology and a minor in Geology or vice-versa.

In Sweden, according to the Government Bill 2009/10:89, one can teach if one has a degree in subject education. This diploma encompasses two separate specializations: one to be able to teach lower secondary school, and b) another to teach upper secondary school. One must choose one of these specializations when enrolling for the Masters of Art/Science for secondary school (SCS 1993:100). Unlike the Portuguese case, in Sweden, the sets of subject areas of teaching are not predetermined in legislation. Instead, they depend on some restrictions imposed both by the Government and the higher education institution that confers the degree. However, you can choose to be, for example: a) an English and Biology teacher; or b) an English and Physics teacher; or c) a sports and physics teacher; etc. So, unlike the Portuguese case, in Sweden you can teach both one subject from the area of natural and physical sciences and another subject from another completely different area, such as English, Physics and so on.

### *Initial teacher education curricula*

We will now analyse the meso level of the ITE curricula. Previously in this text, we have defined curriculum as an organized and structured study plan. In this section we will address the structure and organization of both ITE curricula under study, emphasising the importance of practicum as it is implemented in both cases. The interviews were particularly important to comprehend the ideas and representations of the ITE programmes' coordinators, supervisors and student teachers.

The current teacher education programmes of each higher education institution under study are a result of the implementation of the Bologna's process. Therefore, both specializations have a strong research component. Nevertheless, the curricular structure of these programmes is quite different. In the UL the programme lasts for two years (but the students need to have a previous graduation on the subjects they will teach). This programme awards the Master title upon completion, which nowadays is a requirement to teach in Portugal. In MU the duration of the programme is four and a half years for lower secondary school teachers and five years for upper secondary school teachers. According to the ITE programme's coordinator of MU, this programme does not award the Master title because this is not a requirement to teach in Sweden. However, to teach in Sweden teachers must have a certification on the subjects they will teach. This certification is issued after their first year of teaching.

According to the interviewed coordinator and student teachers, the creation, at MU, of the “academic teacher subjects”, where there is a strong relation between didactics and scientific subject knowledge is considered to be a strength of this programme. At UL there are specific courses for each of those training components; there are no specific courses devoted exclusively to the intertwining of didactics and subject knowledge. At this institution, the investment in the quality of training is perceived by the coordinator as a strength. In MU the current organization of the curriculum was also referred by the interviewees as a strength. Nevertheless, the lack of specificity and clarity of some lectures is perceived by the student as a weakness. Another perceived weakness, both by the student and the coordinator, is the high disciplinary load of the UL's programme. From the data we have collected in the interviews, we can conclude that at both institutions the students are not involved in the definition of curricular contents. Regarding the overall ITE curriculum, these contents are in both cases defined by commissions. But in what concerns the specific contents of the courses, these are defined by the teachers, at UL, and by a commission of teachers, at MU. In this last case, contents are subjected to validation by the Faculty Director. According to the programme coordinator, in the UL the definition of curricular contents is based upon international recommendations and specific national characteristics of the educational system. In MU, also according to the programme coordinator, the definition of curricular contents encompasses national and institutional goals.

### *Initial teacher education practicum*

The organization of practicum is quite different in the studied programmes. By analysing several official internal documents, we have discovered that in the UL practicum is distributed

throughout four courses (one at each semester). However, only the last two courses (which take place in the last year) are the equivalent to an internship. During those courses student teachers observe experienced teachers and practice their own teaching. As stated by the UL’s supervisor and programme coordinator on their respective interviews, the contents of the last two practicum courses are defined according to the students’ pedagogical proposals, which have to be approved by their supervisors.

The practicum at MU is organized around the student teachers’ development of three key-competencies regarding identity, knowledge and communication. These competencies are stated in a written internal document, which regulates practicum. There are five four weeks courses of practicum (all of them are internships), which are scattered throughout the ITE programme. During those weeks, student teachers do not have classes at the university, so they can fully experience what it means to be a teacher. According to the MU’s interviewed students and supervisor, during these periods of time they go to schools and do everything their school supervisor does, that is, they observe the supervisor’s practice, they teach and they even attend meetings. Plus there is, at the first semester of the first year, a testing week, where beginning student teachers can observe experienced teachers at work and decide if teaching is what they really want.

At both institutions, student teachers’ participation in practicum varies according to their school supervisor, but the contact with reality is always progressive and starts with observation. According to the interviewed student and programme coordinator, at UL the observation context can be changeable; however, the intervention context (i.e., the teaching context) is always the same. On the other hand, at MU the context is always the same, either for observation or intervention. The coordinator of this ITE programme perceives this fact both as a strength (because it allows stability) and a weakness (because it does not permit the knowledge of other educational contexts).

Both, at UL and MU, the internship is always set on real practice environments. However, the activities developed by student teachers are not the same at both institutions. According to all interviewees, at UL teaching activities are defined according to the teaching-learning methodologies chosen by the student teachers. At MU, according to the interviewed student teachers and supervisor, although student teachers can choose their teaching methodologies, teaching activities are set by their supervisors.

As stated by all participants, at both institutions student teachers can choose and adapt the teaching methodologies they want to use and their supervisors stimulate them to reflect upon their choices. Nevertheless, this stimulation has different focuses. At UL, reflection is centred on individual performance and on the application efficacy of the chosen teaching strategy. At MU, student teachers’ reflection is centred on the key-competencies of practicum, and even on some guidelines proposed by the supervisors.

All of the above mentioned characteristics allow student teachers to learn to teach, because they undergo a learning process, as highlighted by Montero (2001), that helps them to think, know, feel and act like a teacher, as emphasised by Feiman-Nemser (2008).

### ***Curricular similarities and differences***

By comparing both ITE programmes regarding structure and importance given to practicum, we can conclude that the current programmes of both institutions are a result of the restructuration imposed by the Bologna process, which was regulated by specific national and institutional norms, and by the previous experience of each institution’s teaching body. Both programmes have adopted a notable research component: (1) a final report, in the UL’s programme; and (2) two small theses, in the MU’s programme.

We could also recognize that the structure of the studied programmes is quite different. It is important to emphasise differences regarding the duration of the programmes and the distribution of practicum. Despite those differences, there is a clear focus on practicum in both programmes, and the participants of both institutions perceive this as having a huge importance for the development of professional competencies. As such practicum is perceived as a strength.

It is also important to highlight that at UL the theory is used as a foundation for reflection

and as grounding for the student teachers’ decisions regarding practicum. At MU, a reverse logic seems to be used. At this institution student teachers use their practicum experience to reflect upon the teaching theories they have studied. These reflection philosophies are well revealed in the structure of each training programme, because at UL the internship takes place on the last year of the programme (only two courses), and at MU the five practicum courses are internships, and they are distributed throughout the programme. Therefore, when comparing both programmes we can conclude that practicum is strongly represented at MU.

### ***Relation between curricula, practicum, teaching identity, professional and pedagogical quality***

All of the interviewed student teachers showed a strong identification with the teaching profession, having admitted that the ITE programme has a major influence in their professional identity development, especially during practicum, as stated by several authors (Montero 2001; Sutherland, Howard, and Markauskaite 2010; Sutherland et al. 2010). Coordinators and Supervisors of both institutions give particular importance to the student teachers’ reflection about their teaching performances, as they consider it to be an essential contribution for the development of the student teachers’ professional identity. This idea was beforehand stated by Flores (2011) and Flores and Day (2006).

We can then conclude that the participants are aware of the ever-changing condition of the current school reality. They seem to be also confident about the adequacy of the competencies developed during their attendance at ITE programmes, as they seem to be a facilitating foundation for adaptability. With this in mind, we consider that, according to what was established by the Bologna Declaration, these two ITE programmes prepare student teachers to face the teaching profession, and minimize as much as possible the impact inherent to the transition from being a student to becoming a teacher, as long as the (young) teachers keep investing in their training throughout their lives. Thus, these ITE programmes, by training qualified teachers (as emphasised by Hollins 2011), contribute to the development of a socioeconomic competitive Europe, as it has been stressed in key policy documents developed by European institutions for teacher education (OECD 2012; ETUCE 2008; CEC 2007).

### **Conclusions and implications for teacher education**

The characterization that we have made for each ITE curriculum allowed us to understand the structure and organization of each programme, permitting hereinafter the comparison between them in order to recognize their similarities and differences. With this regard, we conclude that despite the fact that the current teacher education programmes of the UL and MU are a result of the implementation of the Bologna’s process, the curricular structure of these programmes is quite different. At UL the programme lasts for two years (but the students need to have a previous graduation on the subjects they will teach), and at MU the duration of the programme is four and a half years for lower secondary school and five years for upper secondary school. Although there are great differences in the organization of practicum at both institutions (at UL there are four courses, but only two are school placements; at MU all five courses are school placements), a great emphasis is given to this curricular component since it has a huge importance to the development of professional competencies. This study emphasises practicum as core, involving different training frameworks and enabling their incorporation into the teaching-learning process. This role of practicum leads us to the idea that it is necessary to deepen this dimension of our study.

Finally, we intended to ascertain the influence of these ITE programmes on the professional and pedagogical quality of the future teachers of natural sciences trained by the studied institutions. We were able to determine that both ITE programmes have strengths and weaknesses, which can be improved in a future restructuration. However, without intending to generalize, taking into account the specific contexts in which both training programmes are set we can determine that these programs prove to be adequate, because they stimulate student teachers’ reflexion and professional growth allowing, from the contact with practicum, the development of a solid set of knowledge and experiences, which contribute to the development of their professional identity.

Thus, we consider that both ITE programmes under study train pedagogically and professionally qualified teachers.

European organizations have produced a set of guidelines for the standardization of higher education with implications in teacher education. However, the development of the European higher education space followed particular paths in different countries, as it can be shown by the analysis of the Portuguese and Swedish official documents with regard to teacher education. In Sweden, teaching qualification is acquired by finishing the first cycle of higher education (graduation). In Portugal, to be a teacher it is necessary to have a master’s degree (second cycle of higher education). We believe this difference means that the Portuguese society values the teachers’ occupational status, since the frequency of a more demanding higher degree is mandatory.

Since we could not find any research studies that studied the influence of specific ITE programmes on pedagogical and professional quality of the student teachers they are training, we think that this study is relevant for the development of scientific knowledge on teacher education. Moreover, this study has also allowed us to understand the importance of ITE programmes for the development of student teachers’ professional identities and the preparedness of those students to cope with teaching challenges. To better understand the extent of these relations more studies of this sort are needed.

## References

- Alarcão, I., and J. Tavares. 2010. “Supervisão: conceitos e práticas.” In *Supervisão da prática pedagógica: uma perspectiva de desenvolvimento e aprendizagem*. Coimbra: Almedina.
- Arends, R. 1995. “Fundamentos científicos da arte de ensinar.” In *Aprender a ensinar*. Translated by M. Alvarez, L. Bizarro, J. Nogueira, I. Sá, and A. Vasco. Lisbon: McGraw-Hill.
- Ball, D., and D. Cohen. 1999. “Developing practice, developing practitioners: toward a practice-based theory of professional education.” In *Teaching as the learning profession: handbook of policy and practice*, edited by L. Darling-Hammond, and G. Sykes, 3-32. San Francisco, California: Jossey-Bass.
- Bardin, L. 2011. *Análise de conteúdo*. Translated by L. Reto and A. Pinheiro. Lisbon: Edições 70.
- CEC (Commission of the European Communities) 2007. *Improving the quality of teacher education*. Communication from the commission to the council and the European parliament. Brussels: Commission of the European Communities. <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0392:FIN:PT:PDF>
- Darling-Hammond, L., J. Banks, K. Zumwalt, L. Gomez, M. Sherin, J. Griesdorn, and L. Finn. 2005. “Educational goals and purposes: developing a curricular vision for teaching.” In *Preparing teachers for a changing world: what teachers should learn and be able to do*, edited by L. Darling-Hammond and J. Bransford, 169-200. San Francisco, CA: Jossey-Bass.
- Day, C. 2004. “Emotions and identities.” In *A passion for teaching*. Oxon: RoutledgeFalmer.
- Decree-Law 42/2005, of 22 February 2005. *Diário da República - I Series-A*, number 37, 1494-1499. [http://www.dges.mctes.pt/NR/rdonlyres/AE6762DF-1DBF-40C0-B194E3FAA9516D79/1773/DL42\\_2005.pdf](http://www.dges.mctes.pt/NR/rdonlyres/AE6762DF-1DBF-40C0-B194E3FAA9516D79/1773/DL42_2005.pdf)
- Decree-Law 43/2007, of 22 February 2007. *Diário da República*, 1<sup>st</sup> Series, number 38, 1320-1328. <http://www.dges.mctes.pt/NR/rdonlyres/84F15CC8-5CE1-4D50-93CFC56752370C8F/1139/DL432007.pdf>
- Dewey, J. 2008. “The relation of theory to practice in education.” In *Handbook of research on teacher education: enduring questions in changing contexts*, edited by M. Cochran-Smith, S. Feiman-Nemser, D. McIntyre, and K. Demers, 787-799. New York: Routledge/Taylor & Francis Group and the Association of Teacher Educators.
- ETUCE (European Trade Union Committee for Education) 2008. *Teacher education in Europe: an ETUCE policy paper*. Brussels: European Trade Union Committee for

- Education.[http://etuce.homestead.com/Publications2008/ETUCE\\_PolicyPaper\\_en\\_web.pdf](http://etuce.homestead.com/Publications2008/ETUCE_PolicyPaper_en_web.pdf)
- Feiman-Nemser, S. 2008. “Teacher learning: how do teachers learn to teach?” *In Handbook of research on teacher education: enduring questions in changing contexts*, M. Cochran-Smith, Sharon Feiman-Nemser, D. McIntyre, and K. Demers, 697-705. New York: Routledge/Taylor & Francis Group and the Association of Teacher Educators.
- Flores, M. 2011. “Curriculum of initial teacher education in Portugal: new contexts, old problems.” *Journal of Education for teaching: International Research and Pedagogy* 37 (4): 461-470. doi: 10.1080/02607476.2011.611015.
- Flores, M., and C. Day. 2006. “Contexts which shape and reshape new teachers’ identities: a multi-perspective study.” *Teaching and Teacher Education* 22: 219-232. doi: 10.1016/j.tate.2005.09.002.
- Gaspar, M., and M.Roldão. 2007. “Desenvolvimento curricular: conceito ou conceitos?” In *Elementos do desenvolvimento curricular*. Lisbon: University Aberta.
- Govt. B. 2009/10:89, presented to the Swedish Parliament on 11 February 2010. *Top of the class: new teacher education programmes*. Fact Sheet U10.009, of 5 March 2010. <http://www.government.se/sb/d/12748/a/140951>
- Hammerness, K., L. Darling-Hammond, P. Grossman, F. Rust, and L. Shulman. 2005. “The design of teacher education programs.” In *Preparing teachers for a changing world: what teachers should learn and be able to do*, edited by L. Darling-Hammond, and J. Bransford, 390-441. San Francisco, CA: Jossey-Bass.
- Hobbs, L. 2012. “Examining the aesthetic dimensions of teaching: relationships between knowledge, identity and passion.” *Teaching and Teacher Education* 28: 718-729. doi: 10.1016/j.tate.2012.01.010.
- Hollins, E. 2011. “Teacher preparation for quality teaching.” *Journal of Teacher Education* 62(4): 395-407. doi: 10.1177/0022487111409415.
- Krippendorff, K. 2011. *Content analysis: an introduction to its methodology*. Thousand Oaks: Sage Publications.
- Lopes, A., and F. Pereira. 2012. “Everyday life and everyday learning: the ways in which pre-service teacher education curriculum can encourage personal dimensions of teacher identity.” *European Journal of Teacher Education* 35 (1): 17-38. doi: 10.1080/02619768.2011.633995.
- Montero, L. 2001. “Aprender a ensinar: a construção do conhecimento profissional.” In *A construção do conhecimento profissional docente*. Lisbon: Institut Piaget.
- OECD (Organization for Economic Co-operation and Development) 2012. “OECD better life index.” OECD. <http://www.oecdbetterlifeindex.org/>
- Snoek, M., and I. Žogla. 2009. “Teacher education in Europe; Main characteristics and developments.” In *Becoming a teacher educator: theory and practice for teacher educators*, edited by A. Swenen and M. van der Klink, 11-27. Heidelberg: Springer.
- Pacheco, J. 2001. “Currículo: conceituação.” In *Currículo: teoria e prática*. OPorto: Porto Editora.
- Pardal, L., A. Neto-Mendes, A. Martins, M. Gonçalves, and A. Pedro. 2009. “Identidade e trabalho docente: representações sociais de futuros professores.” In *Representações sociais sobre o trabalho docente*, edited by C. Sousa, L. Pardal, and L. Villas Bôas, 33-51. Aveiro: University of Aveiro.
- Rodgers, C., and K. Scott. 2008. “The development of the personal self and professional identity in learning to teach.” In *Handbook of research on teacher education: enduring questions in changing contexts*, edited by M. Cochran-Smith, S. Feiman-Nemser, D. McIntyre, and K. Demers, 697-705. New York: Routledge/Taylor & Francis Group and the Association of Teacher Educators.
- SCS (Swedish Code of Statutes) 1993:100, of 4 February 1993. “The higher education ordinance.” <http://www.hsv.se/lawsandregulations/thehighereducationordinance.4.5161b99123700c42b07ffe3981.html>
- Skolverket. 2011. *Curriculum for the compulsory school, preschool class and the leisure-time centre 2011*. Stockholm: Skolverket. <http://www.malmo.se/download/18.29c3b78a132728ecb>



52800034181/pdf2687.pdf

Sutherland, L., S. Howard, and L. Markauskaite. 2010. “Professional identity creation: examining the development of beginning preservice teachers’ understanding of their work as teachers.” *Teaching and Teacher Education* 26: 455-465. doi: 10.1016/j.tate.2009.06.006.

Tavares, J. 1997. “A formação como construção do conhecimento científico e pedagógico.” In *Percursos de formação e desenvolvimento profissional*, edited by I. Sá-Chaves, 59-77. OPorto: Porto Editora.

TNTEE (Thematic Network on Teacher Education in Europe) 2000. *Green paper on teacher education in Europe: high quality teacher education for high quality education and training*. Umea: Thematic Network on Teacher Education in Europe. <http://tntee.umu.se/publications/greenpaper.html>

Yin, R. 2003. *Case study research: design and methods*. Thousand Oaks, California: Sage Publications.

[Back to contents](#)

## **Promoting teachers professional development through online collaborative research: the SoNetTe project and the Open Course Ware pupils’ questions and conscious ignorance in science education**

*Piedade Vaz-Rebelo<sup>1</sup>, José Otero<sup>2</sup>, Carlos Barreira<sup>1</sup>, Júlia Morgado<sup>3</sup> & Paula Fernandes<sup>4</sup>*

*<sup>1</sup>University of Coimbra, Portugal, <sup>2</sup>University of Alcalá de Henares, Spain, <sup>3</sup>High School Santa Maria do Olival & <sup>4</sup>School Network of Seia, Portugal*

*pvaz@mat.uc, jose.otero@uah.es, cabarreira@fpce.uc.pt, juliaqm@gmail.com & pcssf@sapo.pt*

### **Abstract**

This paper describes the Open Course “Pupils’ Questions and Conscious Ignorance in Science Education” developed under the scope of the Multilateral KA3 “Project SoNetTE: Social Networks in Teacher Education”, as well as participants and tutors evaluation. The research questions were: How do open course participants and tutors evaluate the online collaboration developed? What were the lessons learned from the tutor point of view? Science and mathematics student teachers, teachers and teacher educators participated in this study. The instruments used were, for students, a questionnaire based mainly on COLES - Constructivist Online Learning Environment Survey (Taylor and Maor 2000), an interview and rates of success on assignments. Tutors filled a report about the on line course process and the lessons learned. Results point to the interest of the online collaborative research as a teacher education strategy but also to the challenge to organize an online teacher education course with a research approach.

**Keywords:** open course; collaborative research; teacher education.

### **Context of the research**

This paper describes the Open Course “Pupils’ Questions and Conscious Ignorance in Science Education” developed under the scope of the Multilateral KA3 Project SoNetTE: Social Networks in Teacher Education 531150-LP-2012-NL-KA3-KA3MP, as well as participants and tutors evaluation of the process.

SoNetTe is developing online educational open courses and using international collaborative research as a core strategy to promote teacher professional development. It aims to cross borders in educational research, by creating international study groups composed of different personal, professional and cultural backgrounds.

Study group can include student teachers, in-service teachers from different countries and preferable different levels (primary, vocational, secondary education) and teacher educators/researchers that develop a (comparative) research in teaching and learning in an international perspective. Study groups are formed around central research questions, which transnational teams of students, researchers and teachers cooperatively work on, drawing on their experience and open resources.

### **Research questions**

The research questions are: How do participants and tutors of the course evaluate the online collaboration developed? What did participants learn from their participation in the online course? What were the lessons learned from the tutor point of view?

### **Theoretical framework**

It is now beyond question the importance of teachers’ professional development throughout their career. As it is referred in OECD report (OECD 2009, 49):

“no matter how good pre-service training for teachers is, it cannot be expected to prepare teachers for all the challenges they will face throughout their careers. Education systems therefore seek to provide

teachers with opportunities for in-service professional development in order to maintain a high standard of teaching and to retain a high-quality teacher workforce.”.

However, studies on the professional development of teachers have shown the complexity of the concept, which it is related with the complexity of teaching itself and therefore of its facilitators agents, processes and strategies. This idea has already been described by many authors (eg. Caena 2011; Day 2008; Guskey 2000), being also reinforced by the results obtained in the international study Teaching and Learning International Survey (Talis) (OECD 2009), which highlights the diversity of actions and contexts that can be associated with the professional development of teachers. Indeed, in the scope of Talis, a set of formal and informal activities of teacher professional development was analysed. Formal professional development included education conferences or seminars (at which teachers and/or researchers present their research results and discuss education problems); qualification programme (e.g. a degree programme); observation visits to other schools; participation in a network of teachers formed specifically for the professional development of teachers; individual or collaborative research on a topic of professional interest; and mentoring and/or peer observation and coaching. Informal professional development activities were also considered namely reading professional literature and engaging in informal dialogue with peers on how to improve teaching (OECD 2009).

There is evidence that teachers consider as particularly significant activities that involve collaborative sharing and reflective approaches. In this purpose, Day (2008) stressed that the importance of collaborative cultures for teacher professional development is also been highlighted by research. Darling-Hammond et al. (2009, 11) confirmed also that “professional community-building can deepen teachers’ knowledge, build their skills, and improve instruction”. Similarly Stanley referred (2011, 72) that “in 2009, researchers conducting a meta-analysis of large-scale teacher professional development surveys, research studies, and evaluation reports found clear research support for significant shortcomings” inherent to informal teacher meeting or one-shot workshops that occur in many school systems”.

Talis results (OECD 2009) also highlighted that the most common form of teacher professional development was “Informal dialogue to improve teaching”. Also in the context of this research it was found that “on average across participating countries, teachers reported that the most effective forms of development were “Individual and collaborative research” (OECD 2009, 74).

SoNetTE project must be considered in the scope of the previous state of the art as it aims to bring together significant issues in teacher professional development, namely online open resources and teachers’ professional learning communities that analyse and research an educational question that teachers face when developing their teaching activity.

## **Research methodology**

### ***Participants***

The course started with nine participants, student teachers of the Masters in Science and Mathematics Teaching of the UC. All the participants were at master or PhD level, but their backgrounds were different: Physics, Chemistry, Biology, Geology and Mathematics. There were also different background experiences among the participants; four already had previous teaching experience. Tutors were two teacher educators from Portugal, a physics education researcher from Spain, and two elementary and secondary physics and chemistry teachers from Portugal.

### ***Planning and implementing the OCW***

The course program and resources were developed by the tutors through e-mail, skype meetings, and presencial meetings. Videolectures, as well as powerpoints, documents, cases, guides were produced or reused. For instance, the videos and documents produced under the scope of TICEC project were also considered as resources.

The course was implemented in a Google website and in a Blog, using also a specific email

account to interact (participants and tutors) sonette@gmail.com. There were also Skype meetings and a Facebook group was created.

The open course website presented general information about it, aims, structure, contacts and others. A user guide was developed with general information about how to access to the website and to the blog.

Modules and assignments launching was announced through e-mail. They were then presented in the website and participants sent the work developed to the SoNetTE e-mail. As part of the assignments they had to share experiences and to participate in the blog.

### ***Instruments***

Rate of success of the assignments delivered by participants in course and rate of participation in the blog were considered.

Participants in the online course were asked to answer a questionnaire, a monitoring tool for study groups' work that is based mainly on COLLES - Constructivist Online Learning Environment Survey (Taylor and Maor 2000). Statements were grouped under certain themes: Relevance, Reflection, Interaction, Making sense, Course instructors(s) support, Peer support; extra statements were also developed about Climate of trust, Course instructions, ICT/Attitude, Joint research, Doing research, General opinion; there were also some open questions about general and technical evaluation of the online course were also formulated. There were also an interview about general evaluation of the online course. Tutors filled a report about the on line course process and the lessons learned.

### **Findings**

Participants developed with success all the assignments established in the modules, although the deadlines had to be revised. All the participants interact in the blog, sharing their experiences and commenting other participants' experiences. A synthesis of the comments in the blog is presented in Table 1.

Table 1. Synthesis of the comments in the Blog

Blog	Page visualizations
Activity 0: Who is who! 21/09/2013, 15 coments	115
Activity One: Why is pupils questioning important?... 06/05/2014, 15 coments	80
Activity Two: Pupils questioning in maths and scie... 11/06/2014, 12 coments	56
ActivityThree: Barriers to pupils questioning andh... 06/07/2014, 13 coments	55

### ***From the students perspective***

This course was the first experience of online course for all the students.

The analysis of answers to the questionnaire COLLES (Figure 1) evidence mean rates of 5 in the categories Relevance, Reflection Course Instructors and General Opinion. Considering this results, it can be concluded that participants considered that the Course was relevant, focused on issues that interest them, that are important and relevant for their professional practice.

Participants also considered that the online course learning promoted reflection, critical thought and that the course instructor(s) stimulated thinking, encouraged participation, and supported active discussion. Overall, the online course was considered well implemented and participants would like to continue with this kind of course in the future.

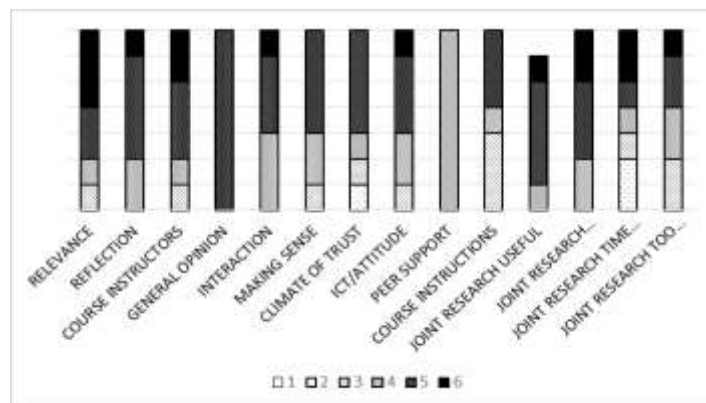


Figure 1. Rates of COLLES categories

The mean rates to categories of Interaction, Making Sense, Climate of Trust, ICT/Attitude was 4.5. Participants considered that in the online course interaction was lively between the participants, that they used ideas from other students' messages and were able to come up with new conclusions/knowledge together with other students. Participants also considered that the virtual environment functioned well and was easy to use.

Categories with lower mean rates, although positive, were Peer Support and Course Instructions. Participants identified difficulties to develop collaborative learning and to develop assignments individually. Exploring the topic of Course Instructions in the interview evidenced that guides and documents provided were considered very useful, however English language sometimes caused some difficulties.

Joint research was considered useful and interesting, although demanding and time consuming. Those rates call attention to the course structure and plan, namely that assignments must fit the research tasks.

Analysis of answers to the interview also shows that participants were satisfied with the participation in the course, as this was an opportunity to learn new topics and interact in a different way with other colleagues. They were a bit surprised with the topic of pupils questioning as this implies a change in focus, but they became highly committed in the development of the assignments.

The analysis of the answers to the interview question “What did you learn in this course?” shows that the topic of pupils' questions was considered relevant as well as to become aware of the importance of pupils questioning in the teaching and learning processes, either for teachers, either for pupils. Participants valued to get suggestions about how to promote questioning in class. It was also considered relevant the exchange of ideas and the feedback received. As participants were mainly student teachers, observing classes and interviewing teachers were very meaningful. They were not familiar with educational research, so more time and specific tasks must be foreseen in similar situations. Instructors helped to do data analysis. But this fits with the definition of study group: participants and tutors will do a research together on the following research questions and actively participate gathering and analysing data and discussion the results.

Some improvements according to the feedback could be made. Participants' also make suggestions: they referred that the tasks assignments of the course were considered demanding taking in account that participants have also other activities. Participants also suggested to begin earlier in the semester and to present some resources in another language (in mother tongue).

### *From the tutors point of view*

As the instructors already collaborated in previous researches about pupils questioning and are very interested in the topic, so their role in the course was instructional but they also collaborate in gather and analysing data.

Managing communication in an online course is a challenge. There must be developed a previous plan of messages to send in order to present the assignments, maintain the interest, and

also to preview the time between each message. Social presence is a very important element of online courses, but teaching presence and cognitive presence must also be assured.

Finally, tutors became aware that most of teacher training curriculum topics can be approached in this format, allowing a research based and internationally perspective.

### **Conclusions and implications for teacher education**

Results point to the interest of the research as a teacher education strategy but also to the challenge to organize an online teacher education course with a research approach.

Some challenges faced were related to the management of the virtual learning environment and to the requirement to conciliate instructive and research issues.

As SoNetTE project aims to make open teacher education courses accessible to student teachers and teachers from other countries, an international perspective can also be reached, giving opportunities to learn more about pedagogies and teaching methods in different educational cultures.

### **Acknowledgements**

This work was supported by the European Commission under Grant 531150-LP-2012-NL-KA3-KA3MP - Multilateral KA3 Project *SoNetTE: Social Networks in Teacher Education*.

### **References**

- Caena, F. 2011. *Literature review quality in teachers' continuing professional development*. Education and Training 2020 Thematic Working Group “Professional Development of Teachers”. European Commission. Directorate-General for Education and Culture Lifelong learning: policies and programme School education; Comenius.
- COLLES (Constructivist Online Learning Environment Survey) <http://surveylearning.moodle.com/colles/>
- Darling-Hammond, L., R. Wei, A. Andree, N. Richardson, and S. Orphanos. 2009. *Professional learning in the learning profession: a status report on teacher development in the U.S. and abroad*. Stanford, CA: National Staff Development Council.
- Day, C. 2008. “Committed for life? Variations in teachers’ work, lives and effectiveness.” *Journal of Educational Change* 9 (3): 243-260.
- Guskey, T. 2000. *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.
- OECD 2009. *Creating effective teaching and learning environments. First results from TALIS*. <http://www.oecd.org/dataoecd/17/51/43023606.pdf>
- SoNetTE Project. <http://www.sonette.org/tiki-index.php>
- Stanley, A. 2011. “Professional development within collaborative teacher study groups: pitfalls and promises.” *Arts Education Policy Review* 112: 71–78.
- Taylor, P. and D. Maor. 2000. “Assessing the efficacy of online teaching with the constructivist on-line learning environment survey.” In *Flexible futures in tertiary teaching. Proceedings of the 9th Annual Teaching Learning Forum*, edited by A. Herrmann and M Kulski, 2-4. Perth: Curtin University of Technology.

Back to contents



## Transition of novice teachers into school teaching and their support by mentor teachers

*Miluše Vítěčková<sup>1</sup> & Zdenka Gadušová<sup>2</sup>*

*<sup>1</sup>University of South Bohemia, Czech Republic; <sup>2</sup>Constantine the Philosopher University in Nitra, Slovakia*

*mviteckova@pf.jcu.cz & zgadusova@ukf.sk*

### Abstract

The paper presents the partial results of Czech and Slovak research in the field of mentoring novice teachers. The Slovak research was initiated by the Faculty of Arts, Constantine the Philosopher University in Nitra in 2012. Its main goal was to identify key competences of mentor teachers. Contact with the Faculty of Education, University of South Bohemia in Ceske Budejovice was established at the end of 2012. To identify the key competencies of mentors as accurately as possible it was also necessary to tackle problem areas novice teachers' face. The paper presents questionnaire findings collected from 148 novice teachers and 67 mentor teachers in the Czech Republic and from 132 novices and 127 mentors in Slovakia. Furthermore, the researchers also carried out interviews (with 30 novices and eight mentors in CR and with 17 novices and 26 mentors in SK). In both countries the research sample was represented by a mixed group of novices specialized in teaching different subjects at different levels of compulsory education.

**Keywords:** university study; novice (teacher); mentor (teacher).

### Context of the research

This paper examines the beginning of a teaching career in two nation states, which until 1993 had shared a common history as the unified state of Czechoslovakia. At that time, the adaptation phase of novice teachers at schools was addressed systematically. The issue of our interest is whether, and how, the position of novice teachers at schools in the Czech Republic and in Slovakia has changed since then. At the same time, if we look at how this issue is dealt with in other European countries, we can see only a few countries in Europe provide a coherent and systematic induction programme for their novice teachers, even though the quality of teacher education and training has become a policy priority in many countries of the European Union. In 2009, ministers of education participating in an informal meeting in Gothenburg called on all EU member states to ensure support programmes for the induction of novice teachers. This paper therefore not only presents self-identified problem areas novice teachers face at schools in the context of their academic training, but it also deals with the support of these teachers provided by mentors.

We start with the results of the research, which was primarily focused on identifying the key competencies of mentor teachers. In Slovakia the research was launched in 2012 by the Faculty of Arts, Constantine the Philosopher University in Nitra and it was financially subsidized by the national research agency VEGA (project N° 1/0677/12 Key mentoring skills necessary for the successful induction of novice teachers). By the end of the year cooperation with the Faculty of Education, University of South Bohemia in Ceske Budejovice was established. Based on this cooperation, in 2014 another two-year Czech and Slovak project bid was submitted and approved for financing by the Ministry of Education of the Czech Republic and national research agency APVV (project N° 7AMB14SK046), whose aim is to identify the personal and professional needs of novice teachers. In the context of this paper, attention is focused only on the issues of novice teachers' transition into teaching, i.e. only partial results of the Czech and Slovak research are presented. This is the data collected in the joint research; the data from the interviews is currently being analysed, thus the quotations from the interviews are used only to illustrate the findings obtained through the questionnaire survey. The research results should have a positive impact on



both pre-service teacher-training (feedback from novice teachers about their university studies/training) as well as on the support provided by mentors during novices' first year in schools. Though in Slovakia the position of mentor has been anchored in education legislation, no other instruction or training for mentors has been introduced, and that is why currently supporting training materials for mentor teachers (also mentioned in the paper) are being developed.

### **Research aim**

This paper presents the partial results of Czech and Slovak research in the field of mentoring novice teachers.

### **Theoretical framework**

The Slovak research was initiated by the Faculty of Arts, Constantine the Philosopher University in Nitra in 2012. Its main goal was to identify key competences of mentor teachers. As mentioned above, in Slovakia, as opposed to the Czech Republic, the induction of novice teachers has a legislative basis. That is why in the Czech Republic it is a common occurrence that novice teachers at the beginning of their careers are not given any assistance or support, and the likelihood of a reality shock is greater, which has been mentioned by many researchers (e.g. Průcha 2009). This doesn't mean that novice teachers need only methodological guidance; they equally need personal and emotional support. According to the findings of Prokešová (2000), emotional support, and provision of professional and personal support were considered to be the most important areas of support during the induction of novices. When reflecting upon university training, a very frequently mentioned phrase was “teaching practice”, i.e. a lack of teaching practice in both countries. Many academics emphasize the role of teaching practice during university studies. As Štáva (2004) states, the person who understands how difficult, complicated and demanding the work of teachers is also understands how important the role of teaching practice is in education and training of trainee teachers. Education in subject theory, pedagogy, psychology, philosophy and ethics, however, is not subject to question. As reported by Šimoník (2005), the effectiveness of university studies is closely connected with a consistent linking of theory with practice. However, one cannot forget the fact that the induction of novice teachers is influenced also by formation of their personalities, i.e. by those traits which are the result of education (Průcha 2002), and also how the teacher is personally equipped to perform the job of teacher. Experience - a sentiment expressed also by Švec (2005) - is not enough to turn a trainee teacher into a teacher. The situation in Slovakia, as opposed to the Czech Republic, is easier, as each novice teacher has a legally appointed mentor. In the Czech Republic it is up to the head teacher whether he or she appoints a mentor for a novice teacher or not. In both these countries there are hardly any conditions suitable for mentoring novice teachers; mentors get no support either at their schools or from any other institutions (as, for example, the so-called Methodology and Education Centres, which are based in all regional cities). The way in which novices are treated by mentors to a great extent depends only on the personality and experience of mentors, on mentors' willingness or lack of will to pay attention to the novice teacher and devote some of their free time to the job of mentoring.

### **Research methodology**

In the Czech Republic 148 novice teachers and 67 mentor teachers participated in the questionnaire survey. In Slovakia it was 132 novices and 127 mentors. The interviews have been carried out with 30 novice teachers and eight mentors in the Czech Republic, and in Slovakia 17 novices and 26 mentors have been consulted. In both countries the interviewed teachers formed a mixed group, i.e. the interview participants had finished different types of teacher education within their pre-service training and taught different school subjects. In all cases, however, they had just one, or in some cases two, years of teaching at school (upper limit of teaching experience at school was four years). Furthermore, in the paper data from the diploma work of Géblová (2014),

supervised by Vítěčková, is also stated, as her work was devoted to novice teachers; however, these were primary school novices (67 questionnaire respondents and 5 interviews with novices).

## Findings

### *Impact on university training*

Before we proceed to the results relating to the first year teaching at school, it is necessary to mention the way in which novice teachers perceive their university education, because it is possible to expect that these results correlate with the problems novices face during their first year of teaching. In the interviews the greatest weight was attributed to a lack of practice, i.e. too much theory without connection to practice. It is interesting that in Slovakia practical skills acquired, among other things, during practice are ranked higher than in the Czech Republic. Nonetheless, the research data in both countries shows a considerable lack of training in the area of solving discipline problems with pupils. On the one hand, novice teachers evaluate quite positively the skills acquired during practice, but, on the other hand, it is possible to require better preparation that involves solving these discipline problems. Here it is possible to think about higher education pre-service training of teachers in the sense, mentioned by Spilková (2007, 14), that:

“the main task of the faculties of education is to overcome transmissive approach to teaching, when knowledge is transmitted as a final product, in the standard form of definitions and abstract theories without any reference to specific contexts of school education and trainees’ own experience through verbal methods and frontal organization of teaching.”.

According to Spilková (2007) the result of such training is, inter alia, the inability of trainees to use their knowledge acquired during their higher education studies to solve practical problems in real situations at school. The results obtained from the questionnaire survey both in the Czech Republic and Slovakia reveal just slight differences. In Slovakia subject education and methodology of teaching the subject(s) is a little better evaluated. In the Czech Republic, on the other hand, it is work with integrated learners and dealing with stressful situations which is higher ranked. The concrete results of the survey are presented in Table 1. The table presents the data collected from the answers to the question: “How do you find your higher education studies in terms of...” (and the list of concrete areas of interest follows).

Table 1. Quality of higher education teacher training (%)

Czech Republic			Slovakia		
Opinions on higher education studies regarding...	excellent+ very good	average + weak	Opinions on higher education studies regarding...	excellent + very good	average + weak
Subject(s) knowledge	76.3	23.7	Subject(s) knowledge	75.8	16.0
Use of ICT	42.6	57.4	Methodology of subject(s) teaching	57.5	33.3
Methodology of subject(s) teaching	39.2	60.8	Use of ICT	46.3	48.5
Textbook use	37.8	60.1	Practical skills (developed also during teaching practice at schools)	43.2	50.8
Assessment of learners	31.8	68.2	Textbook use	40.2	50.0
Practical skills (developed also during teaching practice at schools)	31.1	68.9	Assessment of learners	28.8	62.1
Work with integrated learners with special educational needs	22.9	76.3	Work with administrative documents	21.2	68.9
Work with administrative documents	16.2	83.7	Work with integrated learners with special educational needs	12.9	78.1
Dealing with stressful and difficult situations (discipline of learners and others)	15.5	84.4	Dealing with stressful and difficult situations (discipline of learners and others)	9.1	81.8

Explanatory note: Due to the fact that in some cases the question hasn't been answered the total sum is not 100 %.

As for the training of teachers, it is important to mention that in the past (up to the year 2005) in both countries teachers for lower and upper secondary schools as well as primary school teachers were trained in higher education institutions and their training used to last five years; for primary school teachers this was four years. The novice teachers graduated with a qualification similar to an M.Ed. It is only in the last decade that teacher training has undergone a split into two levels (three-year bachelor and two-year master's). Primary school teachers are trained to teach all subjects at that level and secondary school teachers are trained to teach just two subjects. The training includes three streams of training: subject education; so-called general education for teachers (which means education in subjects such as pedagogy, psychology, child biology, school hygiene, and others); and teaching practice at schools. However, if we look at this situation from the point of view of the number of credits, then, for example, secondary school teacher training looks like this: at bachelor level it is 120 credits for subject education plus 60 credits for general education for teachers (including 4 credits for observation practice at schools) and at master's level it is 80 credits for subject education plus 40 credits for the general education for teachers (including 14 credits for teaching practice at schools).

### *Novice teachers' needs*

As mentioned at the beginning of the paper, although the research was primarily aimed at the identification of key competencies of mentor-teachers, in this context the needs of novice teachers and problem areas which they struggle with during their first year at school have to be taken into consideration as well. The research data shows that novice teachers evaluate their professional training as very good, but at the same time it is evident from the data that they are not always able to apply this knowledge in concrete situations. The problems they have experienced are connected mainly with the area of their administrative work, motivation of learners and dealing with disciplinary issues. Their perception of a mentor teacher can be expressed as somebody who should primarily provide them with psychological support, who will be their generous guide rather than a professional advisor. In the Czech Republic, however, only 71.6% novices had a mentor and of those only 61.5% had been appointed by a head teacher. In 10.1% cases, mentoring of novices was provided on the basis of voluntary help by colleagues.

If we look at the problems novice teachers are most concerned about and if we create a hypothetical ranking of them, then we can see the comparison between the Czech Republic and Slovakia in the Table 2.

Table 2. Problem areas faced by novice teachers (%)

Czech Republic			Slovakia		
Problem Area	always + usually	seldom + never	Problem Area	always + usually	seldom + never
Work with administrative documents	41.2	58.8	Work with administrative documents	43.2	37.8
Motivation of learners to perform learning activities	29.1	70.2	Selection of appropriate teaching strategies, teaching methods and techniques	30.3	61.3
Teaching process management (setting and keeping rules, maintaining respect and discipline of learners)	28.4	71	Teaching process management (setting and keeping rules, maintaining respect and discipline of learners)	25.0	69
Selection of appropriate teaching strategies, teaching methods and techniques	24.3	75	Motivation of learners to perform learning activities	23.8	69.7
Communication with learners' parents	21.7	77.7	Setting and formulation of teaching aims	21.3	72.7

Explanatory note: Due to the fact that in some cases the question hasn't been answered the total sum is not 100 %.

From the collected data it is evident that in both countries novices perceive the area of administrative work as the most problematic. This is an interesting finding as there are no

unpredictable situations in this area of teachers' work. Furthermore, one can see how much attention is paid to administrative work. In comparison with the situation in Slovakia, Czech novice teachers find motivation of learners for learning activities more problematic, and they consider selection of appropriate teaching strategies, teaching methods and techniques to be less important, although the selection of appropriate teaching strategies, methods and techniques, no doubt, contributes to motivation of learners.

The above mentioned problem areas suggest also the areas where novice teachers need support and help. As a contrast to areas such as the development of relations with school management, solving misunderstandings with colleagues and with a mentor, which were mentioned in the bottom places as least important, novices have stated certain areas as very important. They have assigned, for example, high importance to the support of close friends and family as well as colleagues (this corresponds with the research findings of assoc. Prof. Prokešová and her colleagues, who studied these questions at the University of South Bohemia in České Budějovice). A crucial fact, which is reflected in problem areas and needs of novice teachers, was identified in the open question. The fact is that teacher trainees do not have enough time allocated to teaching practice within their pre-service training: “I need a lot of practice so as to learn from examples of good and bad practice what lessons taught at school should (or should not) look like.” Here, however, it needs to be considered to what extent trainee teachers are able to use experiences from teaching practice and also to what extent they are able to modify these experiences and also their theoretical knowledge acquired during their university studies.

### ***Mentors' role***

As stated above, in the Czech Republic, as opposed to Slovakia, after the split of Czechoslovakia there has been no legislation defining the position of mentor. The research showed that in the Czech Republic only 71.6% of novices had mentors, out of which only 61.5% were appointed by head teachers. In other cases mentoring support to novices was provided on a voluntary basis by colleagues, friends, or family members.

In the questionnaire survey, mentor teachers were asked a question regarding the importance of different tasks they perform when mentoring a novice teacher. It is interesting to compare the perception of the role of mentor by novice teachers with the perceptions of this role by mentors themselves. The results of the survey carried out with novice teachers suggest that both in the Czech Republic and Slovakia novice teachers expect from their mentors first of all a professional approach, and friendly and accommodating behaviour, which is followed by such things as having time, patience and willingness to discuss problematic issues with the novice teacher and finding solutions to them; only after this was a high level of expertise and professional experience identified. Mentors' perception of their role - what they assign the highest importance to - is shown in Table 3.

It is very interesting that in this case the results are significantly different. One of the possible explanations is that this difference can result from the fact that the position of mentor teacher is legislatively anchored in Slovakia, but not in the Czech Republic. If monitoring and counselling of novices' progress is one of the main tasks of mentors stated in the legislative documents, and if they are expected to prove it in final reports on novices' induction, then, naturally, they will come and observe novices' lessons more often to see their progress, they will regularly discuss problematic issues with them and they will also provide more guidance, support and care to them.

Another issue that is related to this, or in other words expectations versus reality, is what the experience of novice teachers with mentors during their induction at school is. Here the results in both countries, probably also due to legislative measures, are very different. The good news is that the most frequent answers to the question “Did the mentor provide you with professional support?” and “Did the mentor provide you with personal support?” were “regularly and systematically” in both countries. The other options were “sporadically, on demand” and “at longer time intervals, randomly”. The big difference was in answers to the questions: “Were you observed in your lessons by your mentor?” and “Was your mentor interested in new and innovative methodology

and didactic procedures you applied in your lessons?”. In the Czech Republic in both cases the most frequent answer was “at longer time intervals, at random”; as for observations, the figure was 52.9%. On the contrary, in Slovakia mentors observed their novices “regularly and systematically” in 50% of cases, and the following 23.5% “rarely, upon request”. Lack of interest in new and innovative methodologies and didactic techniques and procedures was evident in both countries (in the Czech Republic even more often). Within this area of mentor’s help, another question was asked about the interest of novices in mentors’ new and innovative methodologies and didactic techniques and procedures which they use in their lessons. It is a pity, but for this question the percentage of answers that corresponded with “regularly and systematically” was also not high.

Table 3. Perception of the importance of mentors’ different “tasks” (%)

Czech Republic			Slovakia		
Mentors’ perception of their role regarding...	very important + important	less important + unnecessary	Mentors’ perception of their role regarding...	very important + important	less important + unnecessary
Provision of professional support	97.0	3.0	Provision of professional support	99.2	0.8
Provision of personal support	97.0	3.0	Monitoring of novice’s progress (identification of his/her strength and weaknesses)	97.7	2.3
Counselling (provision of guidelines and information for lesson planning, use of teaching aids, learners’ assessment, and so on)	95.5	4.5	Counselling (provision of guidelines and information for lesson planning, use of teaching aids, learners’ assessment, and so on)	96.1	3.9
Monitoring of novice’s progress (identification of his/her strength and weaknesses)	91.0	7.5	Provision of personal support	93.0	7.0
Support and development of novice’s self-reflection	86.6	13.4	Support and development of novice’s self-reflection	92.2	7.8
Mentor in the role of model for novice teacher	83.6	14.9	Mentor in the role of model for novice teacher	90.6	9.4
Mentor in the role of “critical friend” (provision of constructive feedback) for novice teacher	79.1	19.4	Mentor in the role of “critical friend” (provision of constructive feedback) for novice teacher	82.0	18.0
Assessment (ongoing, phased, final)	74.6	23.9	Assessment (ongoing, phased, final)	87.5	12.5

Explanatory note: Due to the fact that in some cases the question hasn’t been answered the total sum is not 100 %.

To enlarge the research sample and streaming at a certain group of teachers, Dr. Vítěčková assigned a diploma work (Géblová, 2014) which was targeted at primary school teachers. In the research 67 primary school novice teachers were involved. Most of the research questions were the same as in the Czech and Slovak research. But as for mentoring novices, in Géblová’s diploma work there was a question aimed at finding whether a novice teacher was also looking for help from other colleagues - and 79% of novices answered this question positively. These were either colleagues from parallel classes or teachers with the same or similar experience with the situation which needed to be solved. What were very interesting were the answers to the question whether novices would have welcomed more frequent observations and subsequent feedback by their mentors. 43% of novices answered “rather not” and 9% of them “definitely not”. Only 7% answered “definitely yes” and 30% “perhaps yes”. In other cases respondents stated that they did not care. As soon as, however, the term “observation” was replaced by the term “mentoring” - which the novices perceive more like a helping hand than checking of their work, then the answers were different - 37% stated the answer “perhaps yes”, 21% “definitely yes” and the answer “rather

not” was marked by only 31% of novices, and “definitely not” only 3%.

A positive finding is also the fact that when novices assess their relationship with mentors, the most frequent answer in both countries was “excellent”. What is also important to mention is that novice teachers, to the same degree as mentors, do not think that the longer they teach, the better teachers they are, and neither do they think that the better teachers they are, the better mentors they will be. Mentoring novice teachers requires the mentor teacher to cope with a new position, to acquire new skills and develop new abilities in order to counsel novices. As stated by Lieberman, Hanson and Gless (2013) there are several dimensions which a mentor must become aware of and cope with:

- the necessity to build their own identity, which includes a new professional role;
- learning and becoming aware of acceptable and appropriate leadership skills;
- personal development, which may be, due to the lack of preparation and training for this role, accompanied by many unforeseeable difficulties;
- an ability to deal with and solve difficult situations;
- development of trustworthy relationships between mentor and novice teachers, which may be accompanied by other difficulties because it is a relationship at the interface between formal and informal. It is necessary to find a balance and limit the border between mutual respect and at the same time with a certain amount of emotional empathy.

In Slovakia recently (2014) the book *Formovanie kompetencií uvádzajúceho učiteľa* (Forming Mentors’ Competences) has been published. It was written by a team of researchers involved in the project VEGA 1/0677/12 “Key Mentoring Skills Necessary for the Successful Induction of Novice Teachers” and it is aimed at serving as supporting training material for mentors in developing their mentoring skills. The tasks from the book were piloted in a number of workshops for teachers and workshop participants evaluated them as very useful, contributing to the development of mentors’ awareness of the job they do.

Another finding from the mentors’ questionnaire survey was the areas in which mentors feel themselves insecure and would need to improve through further training (see Table 4). The identified areas of mentors’ weaknesses represent the issues to focus the support upon. Due to inconsistent support for novice teachers and a lack of systematic support for mentors, it would be relevant to pay more attention to the areas identified by mentors in the questionnaire survey. The research findings in the Czech Republic and Slovakia vary considerably.

Table 4. Perception of the importance of mentors’ different “tasks”

Ranking*	Czech Republic	Slovakia
1	Methods for novices’ critical self-reflection development	Methods for novices’ critical self-reflection development
2	Methods for novices’ interpersonal skills development	Novices’ structural lesson observations
3	Methods for novices’ managerial skills development	Assessment of novices’ work and behaviour after certain stages
4	Modelling (demonstration of teaching techniques and procedures)	Ongoing assessment of novices’ work and behaviour
5	Novices’ structural lesson observations	Modelling (demonstration of teaching techniques and procedures)
6	Provision of constructive feedback to novices	Provision of constructive feedback to novices
7	Methods for novices’ communicative skills development	Methods for novices’ interpersonal skills development
8	Ongoing assessment of novices’ work and behaviour	Methods for novices’ managerial skills development
9	Assessment of novices’ work and behaviour after certain stages	Methods for novices’ communicative skills development

\* Ranking is based on the sum of answers “strongly” and “to some extent” vs “I do not need”

If we had taken into consideration only the number of answers consisting of “strongly

needed”, then, the first three places would have been occupied by these areas of mentors’ needs development: (in the Czech Republic) provision of constructive feedback to novices, methods for novices’ communicative skills development, and methods for novices’ critical self-reflection development; (in Slovakia) methods for novices’ critical self-reflection development, provision of constructive feedback to novices, and methods for novices’ managerial skills development.

### *Discussion*

The research results, in principle, pointed to the fact that the professional induction of graduates of university teacher-training programmes into schools is full of self-contradictions and presents a number of problems for novice teachers. Novice teachers in most cases believe that they are professionally well-prepared for their teaching career. However, as soon as they face common practical teaching situations and have to find solutions to them, not to mention situations in which it is necessary to solve educational problems, they start to hesitate and do not feel fully confident in solving them. They are either unable to find ways in which to apply acquired theoretical knowledge in practice or figure out what they do not yet know - in other words, what they were not taught (and did not learn) at university. The research results can therefore be an incentive not only for mentor teachers’ identification of those areas in which novice teachers need help and support, but these results also reflect pre-service teacher education in higher education institutions, which is largely focused on the acquisition of knowledge and less on creative work around it and its practical applications. Our intention is to make trainee teachers during their university studies ask themselves such questions as: “What is this knowledge for?”; “Where/When will I need it?”; “How will I apply it in a particular situation?”; and “How will I deal with a particular situation?”. Examples of “specific” situations (whether real or imaginary) must be elicited on the one hand by university teachers as well as by trainee teachers (either based on their own experiences or teaching-practice lessons). It is advisable for trainee teachers to prepare solutions for specific situations by themselves, then to discuss their solutions in groups and try to rationalize and justify the proposed procedures using acquired theory and expertise. And, naturally, a university teacher should give them feedback. In this way, trainee teachers would expand their knowledge and see that there is not always just one possible solution of a given situation, but that different situations can have several solutions and none of them is necessarily wrong. If teacher training were carried out this way, using problem-solving instruction, such training could possibly substitute the frequently mentioned lack of teaching experience during pre-service teacher training. The thing is that during teaching-practice lessons the trainee teacher usually sees just one solution to a given situation, and if a mentor teacher does not have time or is not willing to discuss that solution with the trainee teacher, to justify it and optionally also to think about other possible solutions of the situation, then the trainee teacher does not even realize what really happened in the lesson and what (what kind of theoretical knowledge) made the teacher use exactly the solution which he or she used. Much of what novice teachers have to face in the early days of their career could be eliminated if more effective university teacher training were applied. However, currently the situation is what it is; i.e. higher education institutions rely on head teachers appointing mentor teachers to guide and support novice teachers during their induction phase at schools.

### **Conclusions and implications for teacher education**

There is no doubt that support of novices by mentors is important. It would therefore be very appropriate if this phase of the teaching profession was carried out systematically, but it should be based on a voluntary basis and methodological support given to mentors since their amenable behaviour and willingness to help are the most appreciated qualities by novices. Mentors should, however, be trained in different kinds of support and different methods of its provision to novices so as (as the diploma work showed) the novice didn’t feel under scrutiny, didn’t place themselves a priori into opposition, but understood induction and mentoring as constructive support and help.

Regarding a more systematic solution, it is not enough to introduce the position of a mentor teacher within school legislation, but hand in hand with it the creation of appropriate conditions for

mentors should follow, so as to give them enough time and space to work with novice teachers.

### Acknowledgement

This work was supported by the Slovak National Research Funding Agency VEGA under the grant N° 1/0677/12.

### References

- Gadušová, Z. et al. 2014. *Formovanie kompetencií uvádzajúceho učiteľa*. Nitra: FF UKF.
- Gébllová, Z. 2014. *Začínající učitel na 1. Stupni ZŠ*. Diploma thesis, University of South Bohemia in České Budějovice.
- Lieberman, A., S. Hanson, and J. Gless. 2013. *Mentoring teachers: navigating the real-world tensions*. San Francisco: Jossey-Bass A Wiley Imprint.
- Prokešová, L. 2000. “Učitel základní školy a jeho problémy při nástupu do praxe.” In *Učitel a jeho univerzitní vzdělávání na přelomu tisíciletí*, edited by J. Kohnová. Praha: University Karlova.
- Průcha, J. 2002. *Učitel: Současné poznatky o profesi*. Praha: Portál.
- Průcha, J. ed. 2009. *Pedagogická encyklopedie*. Praha: Portál.
- Spilková, V. 2007. “Proměny vzdělávání učitelů v kontextu kurikulární reformy.” In *Proměny učitelského vzdělávání v kontextu reformy základního školství: sborník z pracovního semináře konaného dne 15. 3. 2007 na Pedagogické fakultě MU*, edited by J. Kratochvílová, and H. Horká, 9-17. Brno: Masarykova univerzita.
- Šimoník, O. 2005. *Pedagogická praxe. Některé problémy v „praktické“ přípravě budoucích učitelů pro druhý stupeň základních škol*. Brno: MSD.
- Šťáva, J. 2004. “Pedagogická praxe v systému vzdělávání budoucích učitelů.” In *Pedagogická praxe v pregraduální přípravě učitelů*, edited by J. Havel and T. Janík, 45-50. Brno: MU.
- Švec, V. 2005. “Ohlédnutí za desetiletým vývojem pedagogické přípravy budoucích učitelů.” *Pedagogická orientace* 4: 31-43.

[Back to contents](#)





## A teacher workshop for effective feedback<sup>1</sup>

*Jesuína Fonseca<sup>1</sup>, Carolina Carvalho<sup>1</sup>, Joseph Conboy<sup>1</sup>, Ana Paula Gama<sup>2</sup>, M<sup>a</sup> Odete Valente<sup>1</sup>,  
M<sup>a</sup> Helena Salema<sup>1</sup> & Edite Fiuza<sup>3</sup>*

*<sup>1</sup> University of Lisbon, <sup>2</sup>Institute of Higher Education Dom Afonso III, <sup>3</sup>Lusophone University of  
Humanities and Technologies, Portugal*

jesuina.fonseca@gmail.com, cfcarvalho@ie.ul.pt, jeconboy@ie.ul.pt, aapgama@yahoo.com,  
movalente@fc.ul.pt, mhsalema@ie.ul.pt & editefiuza@netcabo.pt

### Abstract

The literature indicates that feedback strategies are a relevant factor in the promotion of student performance as well as in the relation between teachers and their students. Our objectives included the description of a workshop aimed at teacher education in the area of communication strategies in the classroom involving feedback, and the analysis of the results of the workshop. Twelve teachers, with students ranging from the 7<sup>th</sup> to the 11<sup>th</sup> grades, participated in the workshop. Data included observation and written reports prepared by the participants. Data analysis was qualitative and descriptive. Observation and teacher reports indicated that participation in the sessions and the follow-up classroom application enhanced teacher involvement, knowledge and competencies in the use of feedback strategies. In addition, teachers developed positive feelings toward the use of those communication strategies designed to improve involvement, motivation, and the thinking skills of their students.

**Keywords:** teacher education; teacher feedback; effects of a teacher workshop.

### Context of the research

Student engagement and achievement are among the main challenges and concerns that face educators nowadays. School administrators, teachers and families all recognize that schools are falling behind in inspiring student interest and academic investment. Some research shows student involvement and achievement are related to the quality in teaching and to the professional development teachers receive (Hodge 2014).

Teacher feedback about a student's performance constitutes an important practical aspect of the relationship between teachers and students (Black et al. 2002) and plays a key role in student engagement with the school and in classroom participation and performance (Carvalho et al. 2011; Conboy and Fonseca 2009; Schussler 2009; Verkuyten and Thijs 2009). In spite of its importance, some evidence in Portugal points to a possibly widespread teacher misapplication of feedback in the classroom (Valente et al. 2009), and a consequent need for teacher professional development.

### Research aims

Given the gap between feedback theory and how it may be practised in Portugal, we seek ways to enable teachers to use feedback strategies in an appropriate and efficient way. We ask in this study if a workshop with specific characteristics can be effective in (1) promoting teacher knowledge and skills in using feedback strategies, and (2) raising awareness and appreciation of the importance of feedback strategies.

Our purpose then is, firstly, to describe a workshop aimed at teacher development in the area of communication strategies in the classroom involving feedback and, secondly, to analyse the results of the workshop in terms of improvement of participants' knowledge and skills in using feedback strategies, as well as their appreciation of the importance of feedback strategies. The study is of a qualitative and descriptive nature. Specific data collection methods included observation and written reports.

## Theoretical framework

Feedback consists of the information we receive about how we are doing in the effort made to reach a certain goal (Wiggins 2012) and is always a consequence of how we perform. Its instructional purpose is to provide information related to a task or learning process, in order to improve performance and understanding of a particular subject (Sadler 1989). Feedback seeks to reduce discrepancies between current understandings and performance on the one hand, and a learning intention or goal on the other (Hattie 2009).

Teacher feedback about a student’s performance may constitute one significant practical aspect of the relationship between teachers and students (Black and Wiliam 1998; Black et al. 2002), and plays a key role in student engagement with the school and in classroom participation (Carvalho et al. 2011; Conboy and Fonseca 2009; Fonseca et al. 2011; Fonseca and Conboy 2006; Fredricks et al. 2004; Schussler 2009; Veiga 2009; Verkuyten and Thijs 2009). In spite of its importance, some evidence points to a possibly widespread teacher misapplication of feedback in the classroom (Valente et al. 2009), and a consequent need for teacher professional development.

Feedback has been described as comprising cognitive, motivational and affective dimensions. The cognitive dimension of feedback can be understood as “information provided by an agent (e.g. teacher, peer, book, parent, self, experience) regarding aspects of one’s performance or understanding” (Hattie and Timperley 2007, 81). Such information can have an impact on student performance and self-regulated learning (Kluger and DeNisi 1996, 1998; Salema 2005; Valente 1997; Zimmerman and Schunk 2001, 2007). More specifically, the cognitive dimension involves providing students with the information necessary to understand “where they are in their learning and what they have to do next” (Brookhart 2008, 2). Although we generally think of feedback in its cognitive dimension, the motivational and the affective dimensions are also of great importance. The motivational dimension is associated with the development in students of “a feeling that they have control over their own learning” (Brookhart 2008, 2). The affective dimension of feedback strategies is particularly important and visible when these strategies help promote the affective relation between teachers and their students, as well as students’ involvement, performance and self-regulation (Black et al. 2002; Black and Wiliam 1998; Hattie 2009).

According to Black and Wiliam (1998), the two teacher actions that provide the most powerful impact on learning (compared with other educational innovations) are: (1) involving students in assessment; and (2) increasing the amount of descriptive feedback while decreasing evaluative feedback. Hattie and Timperley (2007), using a meta-analysis approach, concluded that substantially higher effect sizes are observed for feedback strategies than for most typical educational interventions. There is a general consensus that feedback should be applied at a level that students can understand (Orsmond, Merry, and Reiling 2005), and it is more effective at promoting learning and facilitating improvement if it is provided in an enabling environment rather than presented as judgment (Weaver 2006).

Hattie (2009) theorizes that feedback can be directed to different levels: (1) the task (how well tasks are performed); (2) the processing of the task (the process needed to perform tasks); (3) self-regulation (self-monitoring of actions); and (4) the self (personal evaluations of the learner). As such, Hattie (2009) indicates that the strategies adopted by teachers and students to reduce discrepancies will be related, in part, to the level at which the feedback takes place. In addition, in order to be efficient, “feedback needs to be clear, purposeful, meaningful and compatible with students’ prior knowledge and [needs] to provide logical connections” (177-178). Feedback is more effective, according to Hattie (2009), when it confirms the student’s performance, when it focuses on ways to improve performance, and when it is supplied in contexts that protect student identity and self worth.

Feedback is not, however, a panacea for all student academic misfortunes. Nor does it work perfectly in all conditions and in all cases, or no matter how it is used. The affective dimension of feedback is of particular importance when the information conveyed by the teacher focuses on the student rather than on the performance or understanding. This kind of person-centred feedback can have undesired results and increase the fear of failure. Feedback provides information that allows

students to make interpretations about themselves, about others, and about the school. However, if the affective component of feedback is misjudged by a teacher, students may try to avoid the risks involved in tackling a challenging assignment by minimizing their effort, in order to minimize the risk to the self (Black and Wiliam 1998).

Other literature shows that students sometimes do not respond well to feedback, since it can be misunderstood (Lea and Street 2000), it may not be attended to (Hounsell 1987), or it may be attended to but not acted upon (Ding 1998). Furthermore, even when everything seems to be done pedagogically correctly, feedback may not have the desired effect on learning (Fritz, Morris, Bjork, Gelman, and Wickens 2000; McClellan 2001).

Recent research conducted in Portugal suggests that too often teachers employ assessment feedback in the form of statements about the students, themselves, as opposed to statements about the task, task processing and self-regulation. One salient finding of the study described by Valente et al. (2009) was that misuse of teacher feedback seems to be common. Rather than having the objective of focusing on the task and reducing performance discrepancies, feedback was frequently centred on the student self and was used by teachers to accuse, judge and punish. This kind of feedback is not effective in promoting learning and shows how the affective dimension of feedback can act as a double-edged sword (Kluger and DeNisi 1996). Based on these findings we conclude that, in Portugal, there is a need for additional emphasis on programs of teacher education that assure feedback strategies are used in classrooms in an appropriate and efficient way.

### **Research methodology**

The workshop is part of a larger research project and includes topics such as Student involvement; Academic trajectories and feedback; Communication strategies and cognitive processing; Feedback types and strategies and their consequences; Non-verbal feedback in collaborative work, and Critical thinking, teaching and feedback.

The structure and organization of the workshop provided for (1) integration of theory and practice, (2) a long-term implementation (distributed along a school year), (3) classroom application by the participant teachers, and (4) collaborative reflection by peers.

### ***Workshop structure and general procedures***

The sessions included presentation, discussion and simulation of some theoretical background followed by application activities in working groups, including simulations or role playing, first as students, and then as teachers. Finally, teachers applied feedback strategies to their classrooms and reflected upon them and their effects.

Theoretical background included the concepts of different types of feedback and their consequences, as well as the related concepts of student identity, student engagement, and academic trajectories. Participants examined literature, curriculum guidelines and reports that presented indicators of good feedback practices. Participants were requested to develop feedback strategies for their academic areas, to implement the strategies in their classrooms and to analyse their feedback practices. A written report was provided of this autonomous work.

The workshop was structured in eight three-hour sessions, distributed one per month from October to the end of May. Each session was presented in a team-teaching approach by two of the teacher educators; one was responsible for the particular session and the other assured the continuity and articulation among all the sessions. To ensure consistency, the teaching teams participated in regular collaborative reflection meetings. During the month, outside the workshop setting, participants conducted autonomous work, applying new concepts in their own classrooms. They prepared monthly written reports on these activities which were used for discussion and reflection.

### ***Participants***

Twelve teachers from a school in the greater Lisbon area volunteered to participate in the

workshop. All participant teachers had more than five years of teaching experience. They represented the curricular areas of English, Geography, Physics-Chemistry, History, Mathematics, Economy and Portuguese. Students of these teachers ranged from the 7<sup>th</sup> to the 11<sup>th</sup> grades. The workshop took place on the school premises following the establishment of a protocol between the school and the Education Institute of the University of Lisbon. The school is located in a neighbourhood with high population density, and generally low-income families.

### *Instruments and data collection procedures*

In Table 1 we present the general observational grid that was used by the teachers to analyse their own feedback strategies. The grid was used both by participants and teacher educators as a basis for collaborative reflection on the overall work developed. The table includes the seven categories most typically analysed by the teachers in their reports, as well as a brief description of each one. The three strategies and four content categories were based primarily on Brookhart (2008) but also on the works of Hattie (2009) and Wiggins (2012). Using the grid, feedback strategies can be described based on their timing, mode and audience. The feedback's content is categorised in terms of its focus, tone, function and valence, clarity and specificity. Such descriptions can then be analysed, reflected upon and critiqued. It is not our intention to quantify these categories or to rate them in terms of their importance; we present the grid only in order to show how teachers were assessing their feedback. Data analysis was qualitative and descriptive. Workshop evaluation was performed based on information sources such as observation and the analysis of participants' regular written reports.

### **Findings**

We present here some examples of how teachers, in their monthly autonomous work reports, described their use of feedback strategies and how they perceived the importance, and effects on their students, of such strategies. Following each quote, we present the classification according to the Table 1 categories.

Table 1. Observation grid: feedback strategies and content

Strategies and Content	Category	Description
Strategies	Timing	- Provides immediate feedback or slightly delayed feedback, for student comprehension
	Mode	- Selects the best mode for the message (oral, written, visual, kinaesthetic) - Interactive feedback
	Audience	- Feedback is individual; or feedback is given in group
Content	Focus	- On the work; on the processes the student used - On the student's self-regulation
	Tone	- Chooses words that communicate respect and position the student as the agent - Chooses words or attitudes that cause students to think / ask for elaboration
	Function and Valence	- Is descriptive, does not judge - Accompanies negative descriptions of the work with positive suggestions for improvement
	Clarity and specificity	- Uses vocabulary and concepts the student will understand - Tailors the degree of specificity to the student and the task

“... using individual feedback for students working in groups, I became aware that it is for the students that I manage to talk to, although it gives me some frustration that I am not able to attend to all the students in need of help at a particular moment ...” (Audience).

“... In my class about cultural differences, faced with xenophobic attitudes of some students, I confronted these attitudes and involved all students in an activity in which they had to role-play the discriminatory situation, so helping them to improve their citizenship competencies ...” (Focus).

“... During the Physics and Chemistry class, I used simplified vocabulary for better student comprehension of concepts and only later did I introduce the scientific terminology ...” (Clarity and Specificity).

In their final report, participant teachers reflected upon how the workshop contributed to their positive feelings toward the use of feedback strategies in the development of students’ thinking skills and self-regulation skills. We present here some examples of such analysis by the teachers:

“... now I use oral feedback in group work situations and written feedback for written individual work. This seems to function well in terms of helping students to reflect about their work ...” (Mode).

“... now when I return the tests, I give the students their own test, informing them of the score for each question. I asked them to identify the mistakes they had made in each question based on the score they had earned ...” (Tone).

“... As I noticed an alternative conception in the student argumentation, I confronted the arguments with counter-examples in order to lead the student to more rigorous and scientific conceptions ...” (Function and Valence).

“... Using immediate feedback in cases of wrong answers, and delayed feedback for process competencies, will result in student motivation and involvement ...” (Timing).

Finally, we share some relevant comments that summarise participants’ assessment of the workshop and some of its effects.

“... This training allowed me to become aware of some feedback practices that I have already used over the years. Some are positive but others I must put aside. I realise that this training, just by itself, will not magically eliminate less positive aspects of my practice, but it contributed to a closer look on them ...”.

“... In a profession where communication plays such an important role, developing and refining the types of feedback used is key to improving the quality of education. I’m also more aware of some details than I was in the beginning of the workshop, which is positive in understanding and improving my approach to students in the classroom ...”.

## ***Discussion***

Observation and teacher reports indicated that participation in the sessions and the follow-up classroom application enhanced teacher involvement, knowledge and competencies in the use of feedback strategies. In addition, teachers developed positive feelings toward the use of those communication strategies to improve the involvement, motivation, and thinking skills of their students.

Some participants indicated that they already used feedback strategies before the workshop, but not in a careful, systematic and intentional way. They also said that, before the workshop, they did not generally reflect on their feedback strategies.

Participant teachers indicated their appreciation for having worked in teams with the purpose of analysing feedback strategies, as well as for having had the possibility to observe - and to be observed by - colleagues in that respect. This appreciation was evidenced by their participation, in their monthly autonomous work, and in their final reports. They also valued their collaborative reflection on their competencies in the use of feedback strategies, and recognized that they improved both the frequency and the quality of their use of feedback strategies. They seemed to have developed positive feelings toward the use of feedback as a tool for promoting student learning and involvement.

The observation grid was useful in describing feedback in terms of strategies and content. It was not our intention to quantify or compare the categories in terms of their importance, but only to assist teachers and workshop facilitators to describe feedback and foment reflection. In this role, the observation grid was successful as measured by participant comments. Future studies may explore the relative frequencies of observed strategies and content in specific contexts (for example in science, mathematics, language classrooms) in order to develop normative profiles feedback.

In addition to the seven categories eventually used on the observation grid, Brookhart (2008) suggests amount of feedback as a strategy, and comparison as a content (norm-, criterion-, or self-reference). Our experience in the workshop led us to eliminate these two categories since they were essentially unused by participants. In addition, Brookhart originally proposed function and valence as distinct categories. Workshop experience led us to collapse them into a single category. Future researchers may wish to re-introduce, and expand, these categories in order to assess their roles in

other contexts.

Monthly autonomous work reports show that the seven categories were used by the participants to describe observed feedback. Comments indicate a growing awareness on the part of participants of the usefulness of feedback. Participants were, however, realistic in their judgements. As one said, it was frustrating to know that there were students who needed more feedback, but there was neither time nor proper conditions to address all students about all topics. Analysis of the reports lead also to the belief that there was a growing awareness of the benefits of using descriptive feedback about student performance as opposed to using judgmental feedback. Such views are seen as leading to efficacious feedback and are consistent with the theoretical preferences espoused by several authors (Black and Wiliam 1998; Hattie 2009; Valente et al. 2009). Content of the participant reports also reflected a belief that feedback practices had a positive impact on student performance and self-regulated learning as previously predicted (Kluger and DeNisi 1996, 1998; Salema 2005; Valente 1997; Zimmerman and Schunk 2001, 2007).

Participants’ comments indicated that feedback about student performance assisted the quality and tone of relationships between teachers and students. These observations are consistent with theoretical previsions (Black and Wiliam 1998; Black et al. 2002). In addition, participant teachers viewed their students as more engaged in classroom participation (Carvalho et al. 2011; Fonseca et al. 2011; Fredricks et al. 2004; Schussler 2009; Veiga 2009; Verkuyten and Thijs 2009).

Hattie’s (2009) contention that feedback can be directed to different levels (the task, the processing of the task, self-regulation and the self) was supported by the participants’ comments, especially within the content category “focus”. We note in the reports a growing awareness that strategies adopted by teachers to reduce discrepancies needed to be adjusted to the level at which the feedback takes place.

### **Conclusions and implications for teacher education**

Specific teacher education that emphasizes feedback strategies is necessary in order to assure that such strategies are used in the classroom in ways that are both appropriate and efficient. This study provides evidence of how a workshop can promote teacher development in the area of communication strategies in the classroom, specifically those involving feedback. Based on observation and teacher reports, this workshop for teachers, with specific objectives, characterized by integration of theory and practice, distributed along a large period of time (one school year), and focused on application and collaborative reflection by peers and facilitators resulted in change of teachers’ knowledge, competencies and their use of feedback in the classroom.

While this work was carried out in the context of in-service teacher development, many of its implications are also valid for pre-service teacher education. It should be a curricular objective of initial teacher preparation to include topics on the importance of good feedback practice. The topics should address specific objectives, should integrate theory and practice, and should be distributed over a lengthy period of time (that is, not massed into a few classes). The focus should always be on application and collaborative reflection. In this way, pre-service teachers’ knowledge about, and competencies in, the use of best practice classroom feedback will be enhanced.

Future teacher development activities related to feedback communication in the classroom should seek balance and articulation among the training sessions and between theoretical and practical approaches. In addition, the teachers, both in-service and pre-service, must be allowed to develop, implement and analyse their own classroom activities. More time should be allowed for collaborative reflection on teacher activities and their impact on students.

### **Endnotes**

1. An enlarged version of this paper was published in *Revista Portuguesa de Educação*, 28 (1): 171-199 (2015).

## Acknowledgements

This work was supported by the Portuguese Foundation for Science and Technology under Grant number PTDC/CPE-PEC/121238/2010. We thank the school and the teachers involved, as well as our research assistant João Santos.

## References

- Black, P., and D. Wiliam. 1998. *Inside the black box: raising standards through classroom assessment*. London: School of Education, King's College.
- Black, P., C. Harrison, C. Lee, B. Marshall, and D. Wiliam. 2002. *Working inside the black box: assessment for learning in the classroom*. London: GL Assessment.
- Brookhart, S. 2008. *How to give effective feedback to your students*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Carvalho, C., S. Freire, J. Conboy, M. Batista, A. Freire, M. Azevedo, and T. Oliveira. 2011. “Student perceptions of secondary science teachers’ practices following curricular change.” *Journal of Turkish Science Education* 8 (1): 29-41.
- Conboy, J., and J. Fonseca. 2009. “Student generated recommendations for enhancing success in secondary science and mathematics in Portugal.” *Eurasia Journal of Mathematics, Science, and Technology Education* 5 (1): 3-14.
- Ding, L. 1998. “Revisiting assessment and learning: implications of students’ perspectives on assessment feedback”. Paper presented at the Scottish Educational Research Association Annual Conference, Dundee, September 25-26.
- Fonseca, J., and J. Conboy. 2006. “Secondary student perceptions of factors affecting failure in science in Portugal.” *Eurasia Journal of Mathematics, Science and Technology Education* 2 (2): 82-95.
- Fonseca, J., M. Valente, and J. Conboy. 2011. “Student characteristics and student science performance: Portugal in cross-national comparison.” *Procedia Social and Behavioral Sciences* 12: 322-329.
- Fredricks, J., P. Blumenfeld, and A. Paris. 2004. “School engagement: potential of the concept, state of the evidence.” *Review of Educational Research* 74: 59-109.
- Fritz, C., P. Morris, R. Bjork, R. Gelman, and T. Wickens. 2000. “When further learning fails: stability and change following repeated presentation of text.” *British Journal of Psychology* 92: 492-511.
- Hattie, J. 2009. *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.
- Hattie, J., and H. Timperley. 2007. “The power of feedback.” *Review of educational research* 77 (1): 81-112.
- Hodge, E. 2014. “Classroom-based professional development training program.” *Professional Development in Education* 41 (2): 316-320.
- Hounsell, D. 1987. “Essay writing and the quality of feedback.” In *Student learning: research in education and cognitive psychology*, edited by J. Richardson, M. Eysenck, and D. Piper, 109-119. Milton Keynes: Open University Press.
- Kluger, A., and A. DeNisi. 1998. “Feedback interventions: towards the understanding of a Double-edged Sword.” *Current Directions in Psychological Science* 7 (3): 67-72.
- Kluger, A., and A. DeNisi. 1996. “The effects of feedback interventions on performance: historical review, a meta-analysis and a preliminary feedback intervention theory.” *Psychological Bulletin* 119: 254-284.
- Lea, M., and B. Street. 2000. “Student writing and staff feedback in higher education: an academic literacies approach.” In *Student writing in higher education: new contexts*, edited by M. Lea and B. Stierer, 32-46. Buckingham: Open University Press.



- McClellan, E. 2001. "Assessment for learning: the different perceptions of tutors and students." *Assessment and Evaluation in Higher Education* 26: 307-318.
- Orsmond, P., S. Merry, and K. Reiling. 2005. "Biology students' utilization of tutors' formative feedback." *Assessment and Evaluation in Higher Education* 30: 369-386.
- Sadler, D. 1989. "Formative assessment and the design of instructional systems." *Instructional Science* 18: 119-144.
- Salema, M. 2005. "Teacher and trainer training in education for democratic citizenship: competencies, methods and processes." *Journal of Social Science Education* 4 (3): 39-49.
- Schussler, D. 2009. "Beyond content: how teachers manage classrooms to facilitate intellectual engagement for disengaged students." *Theory into practice* 48 (2): 114-121.
- Valente, M. 1997. "Projecto dianoia: learning to think." In *Teaching thinking in Europe*, edited by J. Hamers and M. Overtoom, 282-287. Utrecht: Sardes.
- Valente, M., J. Conboy, and C. Carvalho. 2009. "Student voices on how engagement is influenced by teachers' communication of evaluation results." Paper presented at the European Conference on Educational Research, Vienna, September 28-30.
- Veiga, F. 2009. "Underachievers, overachievers and student's self-concept". *International Journal of Developmental and Educational Psychology* 2: 299-306.
- Verkuyten, J. and M. Thijs. 2009. "Students' anticipated situational engagement: the roles of teacher behavior, personal engagement, and gender". *The Journal of Genetic Psychology* 170 (3): 268-286.
- Weaver, M. 2006. "Do students value feedback? Student perceptions of tutors' written responses." *Assessment and Evaluation in Higher Education* 31: 379-394.
- Wiggins, G. 2012. Seven keys to effective feedback. *Feedback for Learning* 70 (1): 10-16.
- Zimmermann, B., and D. Schunk. 2001. *Self-regulated learning and academic achievement: theoretical perspectives*. Mahwah, NJ: Lawrence Erlbaum.
- Zimmermann, B. and D. Schunk. 2007. *Motivation and self-regulated learning: theory, research and applications*. Mahwah, NJ: Lawrence Erlbaum.

[Back to contents](#)

## **POSTER PRESENTATIONS**



## Teaching models and elementary school teachers’ perspectives on teaching and learning science

*Aparecida de Fátima da Silva<sup>1,2</sup>, M<sup>a</sup> Eunice Marcondes &<sup>1</sup> M<sup>a</sup> de Fátima Paixão<sup>3</sup>*

*<sup>1</sup>University of São Paulo, <sup>2</sup>Federal University of Viçosa, Brazil; <sup>3</sup>University of Aveiro - CIDTFF, Portugal*

afatima.andrade18@gmail.com, mermarcondes@iq.usp.br & mfpaixao@ipcb.pt

### Abstract

This essay investigates the conceptions and explicit teaching beliefs about science teaching holding by a group of elementary school teachers. Teaching models were used as a framework of analysis of teachers’ beliefs. A Reflection-Oriented Process (PRO) focusing on Inquiry Science teaching and Scientific Literacy was carried out in order to promote a deep understanding of science learning in elementary school. The results show that teachers presented very personal Teaching models. These Teaching models indicate internal inconsistency since the teachers pointed out agreement (or disagreement) with contradictory propositions of the theoretical models. Such inconsistency could be related to professional knowledge built by teachers over the years. In addition, the influence of school environment and teaching context are taken into consideration, since social and cultural factors could influence the teachers’ thoughts and teaching practice

**Keywords:** elementary science teaching; teaching models; science teaching.

### Context of the research

Since the 1990’s many studies related to Science Teaching methods pointed out relationships between epistemology and the teaching method and their impact on teachers’ practice, discussing aspects of the teacher’s knowledge (Abib 1996; Garcia 2000; Gil-Pérez 1991; Gil-Pérez, and Carvalho 1993; Harres 2005, 1999; Machado 1995; Mellado 1996, 2003; Peme-Aranega et al. 2006, 2009; Guimarães et al. 2006; Mansour 2013). Garcia (2000) proposed four “Teaching Models” to analyse teachers’ beliefs on pedagogical issues. These issues are concerned to teaching aims, content, pupils’ interests, teaching strategies and evaluation. These models encompass four different approaches: traditional, technological, spontaneous and alternative. The Traditional Model is based on transmission of content by the teacher. The Technological Model has a technical perspective of teaching; its focus is on achieve well-defined objectives. The Spontaneous Model focuses on imediated interests of students, which guides the content to be taught. The Alternative Method is based on teacher as an investigator of the teaching-learning process and on the student being responsible for his or her own knowledge.

### Research aim

This essay aimed to investigate the Teaching Models of a group of elementary school teachers of a rural school in Viçosa, a city in Minas Gerais, Brazil. It was analysed teachers’ conceptions about science teaching and learning. Teaching models will be presented.

### Theoretical framework

#### *Teaching conceptions*

One of the main challenges faced nowadays by science education is to overcome simple, restrictive and naive points of view regarding the teaching-learning process carried by teachers. We agree with Guilbert and Meloche (cited by Praia, Gil-Pérez, and Vilches 2007) that the improvement on science teaching demands changes in teachers’ view about nature of science. Several researches

have shown that epistemological conceptions of common sense becoming one of the main obstacles to innovate Science Education (Mansour 2013; Praia, Gil-Pérez, and Vilches 2007). Similarly, the initial and continuing training courses of teachers need to develop learning situations that foster awareness by the teacher regarding their teaching conceptions in order to reconstruct them and thus plan and apply more effective teaching practices.

One of the main points is to differentiate belief from knowledge. They are distinct mental activities and have different origins. Belief is an unconscious intuition proved by reasons independent from our will. Knowledge represents a conscious acquirement built by exclusively rational methods, such as experience and observation (Le Bon 2005).

Teachers must be aware of this difference in order to be aware of their beliefs and teaching methods and recognize the source of these beliefs in order to analyse aspects that are beyond epistemology and teaching methods and improve their views of teaching-learning process. Therefore, they will be able to implement possible changes in their teaching practices.

Research concerned to the nature of teachers' conceptions and the implications in the teaching practice, offer important information to know the professional knowledge of the teacher. Porlán et al. (1997, 158) described the professional knowledge of teachers as:

“the result of the overlap of four different types of knowledge generated at times and contexts that not always coincide and that remains relatively isolated from each other in the memory of individuals and that manifest themselves in different types of work or pre-professional situations”.

The four types of knowledge are classified according to two dimensions: the epistemological dimension, organised based on the rational and experiential dichotomy and the psychological dimension, based on the tacit-explicit dichotomy (Table 1).

Table 1. Professional knowledge according to Porlán et al. (1997)

Epistemological/ Psychological	Explicit level	Tacit level
Rational level	Academic knowledge	Implicit theories
Experiential level	Ideas and principles of action	Routines and routes of action

Porlan et al. (1997) describe this knowledge as:

- academic knowledge is built by a “set of disciplinary and multidisciplinary concepts teachers have”, reference to the traditional school contents (knowledge related to content), to the education science (psychological, pedagogical and teaching knowledge) or to those which objective is to study the several types of knowledge and their relation with reality (epistemological knowledge);
- the knowledge based on experience “refers to the set of conscious ideas” of teachers during their activity about the different aspects of the teaching and learning process (students' learning, methodology, nature of contents, the role of programming and evaluation, objectives);
- routines and routes of action “refer to the set of tacit schemes that predict the immediate course of events in the class and the way to approach them”. They constitute a knowledge that is closer to manner and are more resistant to changes;
- the implicit theories are related to “not knowing than knowing”, in a way that they can explain the reasons of the beliefs and actions of teachers in accordance with external categories.

According to Porlan et al. (1997) these four types of knowledge present specific epistemological properties that can be summarized in the following tendencies:

- “tendency of fragmentation and dissociation” between theory and action and between explicit and tacit, when the action of the teacher will happen in accordance with not substantiated and inflexible routines;
- tendency of simplification and reduction, which favours a superficial view of the teaching-

learning processes;

- tendency of adaptive conservation and rejection to constructive evolution, when teachers preserve those principles and routines of action that best “disguise appearances”;
- tendency of uniformity and rejection to diversity. “The fragmentation of knowledge, the simplistic view and the immobility have as consequence that beliefs and routines related to action tend to individual and collective uniformity which causes the hegemony of certain professional conceptions and certain Teaching models compared to others” (Porlán et al. 1997).

### ***Teaching models***

Teaching Model is a construct made up of beliefs, culture, the social relations that underlie the process of teaching and learning and the teacher’s intention in teaching their students. Taking into account five dimensions of the teaching and learning process, namely: objectives of teaching (why teach), content (what to teach), strategies (how to each), pupils’ interests and evaluation (how to assess pupils’ learning), Garcia (2000) presents four different approaches to characterize a teaching model: traditional, technological, spontaneous and alternative.

The Traditional Model focuses on content and is characterized by the emphasis on the assumptions of cultural transmission. The aim of Basic Education is to transmit the culture, not taking the social context of the school community into consideration. The methodology emphasizes the rote memorization of information and ignores the interests of the students. Assessment is based on traditional techniques, often demanding memorization of the concepts and not requiring students to demonstrate higher order cognitive skills.

The Technological Model is characterized by a technical and scientific perspective of teaching, responding to the relations between Science and Technology with society. The rationalization of curriculum and rigorous planning is proposed. Activities must be social-context based, be practical and be planned from updated teaching materials. In addition, they must focus on the development of competencies and abilities, providing the student with a “modern” and “efficient” education. The assessment aims to quantify their learning and verify the efficiency of this teaching approach. Students are supposed to participate in the activities prepared by the teachers, who are also responsible for maintaining order and discipline in the classroom.

The Spontaneous Model presents assumptions grounded in the libertarian ideas of the Enlightenment philosopher Jean-Jacques Rousseau, which represents an ideological-political criticism to culture depicted by racioanalism and academicism. In this model, learning is understood as a “spontaneous” process, which occurs naturally. Contents are selected based on the interests of students and teaching activities are open, flexible and multiple aiming the development of social values attitudes and autonomy. Assessment is based on direct observation of the student, analysis of classroom work and personal development of the student. The teacher is responsible for being the social and affective leader.

The Alternative Model assigns a complex perspective to learning taking into account the effective participation of the student and the role of investigator assumed by the teacher in in teaching and learning process. The goal of Basic Education is the progressive enrichment of students’ knowledge, enabling them to understand and act on their social reality. Activities are context-based from socially relevant themes. In this model, the teacher is responsible for planning and carrying out problem-based situations that stimulate and facilitate learning. The students are regarded as an active agent in the construction process of their own knowledge. The assessment has a formative character from the teachers’ identification of students’ difficulties and the promotion of reflections on their developments related to planned objectives.

Theoretical Teaching models represent an important instrument to analyse professional development of the teacher, which enables the researcher to set up linkages between theory and practice, according to Garcia (2000, 4):

“the idea of a teaching model allows to address (in a simplified way as any model) the complexity of the school environment, at the same time helping to propose procedures to intervene in this environment and

therefore underpin strands of educational research and teacher training”.

Moreover, we agree with Mansour (2013) when he pointed out that teaching has no meaning by itself, nor the teacher has exclusive authority over all matters of the act of teaching, since their work and how it is developed depends on the socio-cultural and historical context when and where he/she lives. Teachers’ conceptions about the teaching and learning process are also particularly suitable to give meaning to the contexts and environments in which they work.

However, Guimarães et al. (2006) argued that none of the Teaching Models of Garcia (2000) comprehensively reflects the teaching conceptions of a teacher, and teachers consider characteristics of the different theoretical Teaching models to form their own Personal Teaching Model.

## Research methodology

A Process of Oriented Reflection (PRO) on Inquiring-based science teaching and scientific literacy for early school years was carried out from August 2012 to November 2013. Five teachers (four women and one man) from a public rural school of Viçosa, Brazil, composed the group. All of them had been working as primary teachers for at least fifteen years. The teachers’ names used herein are fictitious, preserving the identity of teachers, according to resolution 196 of the Ministry of Health in Brazil.

To investigate the Teaching Models, an instrument set by Novais and Marcondes (2011), which was based on other studies (Garcia 2000; Gil-Pérez, and Carvalho 1993; Peme-Aranega et al. 2009; Porlán et al. 1997) was used. The instrument has 60 statements that were made considering five dimensions of teaching planning: (i) why teach (Objectives), (ii) What to teach (Contents), (iii) ideas and interests of students (Interests), (iv) how to teach (Methodology) and (v) how to assess (Assessment).

Therefore, for each of these dimensions, a set of three statements was made according the assignments of each Teaching Model: traditional, alternative, spontaneous and technical (Garcia 2000). For each statement, the teacher was asked to indicate his or her level of agreement or disagreement according to a Likert-type scale. For analysis, the individual answers taking into consideration the items: (i) partial agreement (C), (ii) fully agreement (C), (iii) partial disagreement (D), (iv) fully disagreement (D) and (v) no opinion (X) (Santos, and Marcondes 2010). The answers of each teacher are summarized in a table, which was organized in five teaching dimensions: objectives, contents, interests, methodology and assessment. Each table cell represents a statement proposed in the diagnosis instrument. The instrument was applied to teachers six months after the beginning of the meetings.

## Findings

We present an overview of the concepts of each teacher, seeking to identify the contribution of the theoretical Teaching Models in the construction of his/her Personal Teaching Model). The responses given by Roberta to the instrument are presented in Table 2.

Table 2. Responses of Roberta

Teaching Model	Teaching Dimensions																	
	Objectives			Content			Interests			Methodology			Evaluation					
Alternative	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Spontaneous	C	C	C	D	C	C	C	C	C	C	C	C	C	C	C			
Technical	C	D	C	C	C	C	C	D	C	C	D	C	D	C	D			
Traditional	C	D	C	D	C	D	C	D	D	D	C	D	C	C	C			

Legend: C - fully agree, C - partially agree, D - fully disagree, D - partially disagree, X - No opinion about the statement.

Table 2 shows that Roberta agreed with almost all the statements related to the Alternative

Model. Taking into account the Spontaneous Model Roberta disagrees with only one item related to content. These results suggest that Roberta has a social and constructivist teaching view, since these two Teaching Models are based on social constructivist assumptions for the teaching-learning process.

Most of Roberta’s disagreements are related to the Traditional model, although she agreed with the evaluation statements of this model. Considering the statements of the Technical Model, Roberta not showed a clear tendency, since she pointed both agreements and disagreements. Both the Traditional and the Technical model are based on assumptions of Cultural Transmission. Thus, Roberta showed a major tendency to the two first Teaching models, even though she agrees with some characteristics of the two last models. We can infer that there is a consistency in the constitution of Roberta’s personal teaching model, since her personal model holds the educational views of both Alternative and Spontaneous Models. The answers given by Livia are shown in Table 3.

Table 3. Responses of Livia

Teaching Model	Teaching Dimensions																	
	Objectives			Content			Interests			Methodology			Evaluation					
Alternative	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Spontaneous	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Technical	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D
Traditional	C	C	C	D	D	D	C	D	D	D	C	C	C	C	C	C	C	C

Legend: C - fully agree, C - partially agree, D - fully disagree, D - partially disagree, X - No opinion about the statement.

Livia also presents significant agreement with the statements of the Alternative Model. With regard to the Spontaneous and Technical Models, Livia presents a certain level of agreement as she partially agrees with most of the statements of each teaching dimension of these models. Her disagreement with the Traditional Model is significant, especially regarding content and students’ interests.

Thus, there is some degree of inconsistency in Livia’s personal teaching model, evidenced by her answers to the statements. Her personal model seems to be constituted by a amalgamate view of teaching and pedagogical principles of the four theoretical models.

Table 4. Responses of Priscila

Teaching Model	Teaching Dimensions																	
	Objectives			Content			Interests			Methodology			Evaluation					
Alternative	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Spontaneous	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Technical	C	C	C	C	C	D	C	C	C	C	C	C	C	C	C	D	C	D
Traditional	C	D	D	D	X	D	C	D	D	C	C	D	D	C	D	D	C	D

Legend: C - fully agree, C - partially agree, D - fully disagree, D - partially disagree, X - No opinion about the statement.

The answers of Priscila to the teaching model instrument are shown in table 4. Priscila presented a significant level of agreement with the Spontaneous Model as well as the Alternative and the Technical models. However, she disagrees with most of the statements of the Traditional Model. These answers may suggest that some of her educational believes are in transition from traditional conceptions to constructivist ones.

It is evident by her answers, showed on Table 5, that Maria disagrees with the Traditional Model and some of the statements of Technical Model, revealing a position contrary to propositions based on Cultural Transmission. In the other hand, she presents a very significant level of agreement with Alternative and Spontaneous Models. Therefore, we can infer that Maria’s personal Teaching model reflects a social constructivist view of educational process.



Table 5. Responses of Maria

Teaching Model	Teaching Dimensions														
	Objectives			Content			Interests			Methodology			Evaluation		
Alternative	C	C	C	C	D	C	C	C	C	C	C	C	C	C	D
Spontaneous	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Technical	C	C	C	C	D	C	D	C	C	C	D	C	D	D	D
Traditional	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D

Legend: C - fully agree, C - partially agree, D - fully disagree, D - partially disagree, X - No opinion about the statement.

Table 6 shows the answers of Joao to the statements of Teaching Models. Joao's conceptions are quite varied. He agrees with some of the statements of each of the four theoretical models and disagrees with others. Joao does not present a tendency to one specific Teaching Model.

Table 6. Responses of Joao

Teaching Model	Teaching Dimensions														
	Objectives			Content			Interests			Methodology			Evaluation		
Alternative	C	C	C	D	C	C	C	D	C	C	C	C	D	C	C
Spontaneous	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C
Technical	C	D	C	D	D	D	D	C	D	C	C	D	C	C	C
Traditional	C	D	C	C	X	D	C	C	C	D	C	C	C	C	C

Legend: C - fully agree, C - partially agree, D - fully disagree, D - partially disagree, X - No opinion about the statement.

### Conclusions and implications for teacher education

The Personal Teaching Models presented by the teachers who participated in this investigation showed significant variations with respect to their beliefs on the dimensions encompassed in the theoretical teaching model. The Personal Teaching Model of Roberta carries a significant tendency to the Alternative and Spontaneous Models. Lívia and Joao seems to hold a teaching process view not clearly defined, with a slight advantage for the Alternative Model. Priscila and Maria preferences fell on Spontaneous Model.

From these results, we can infer that Roberta has a consistently personal model since Spontaneous and Alternative Teaching Models present similar theoretical and methodological bases, from social and constructivist principles.

Lívia and João, held several agreements with the statements in the five teaching dimensions of the different Teaching models, showing an inconsistency in their teaching views and consequently a degree of inconsistency of their Personal Teaching models. Priscila and Maria seems to hold less conflicting personal models.

Besides their own beliefs, these teachers share the conception that the student in the centre of teaching-learning process. However, there are inconsistencies on their views, which could be related to their pre-existing tendencies according to the knowledge teachers have constructed as a result of their training as a teacher and their classroom practices. These teachers might hold superficial views of educational process, with tendencies to simplification and reduction (Porlan et al. 1997). In addition, the influence of environment and the context where teachers work have to be taken into consideration, because social and cultural factors will influence their thoughts and teaching practice.

In this context, a process of oriented reflection for teachers about their own views of the teaching-learning process would help the teachers to go deeper into their own educational beliefs. This is a complex process, which demands awareness of the teachers' own conceptions of educational issues. In this sense, we believe that theoretical Teaching Models can assist the Process of Oriented Reflection, providing the teachers with opportunities to rethink and overcome their conceptions about teaching and learning in order to develop a more effective, coherent and

responsible teaching strategies.

### Acknowledgements

This project was supported by CAPES, the Education Ministry of Brazil under Grant number 13824/13-9.

### References

- Abib, M. 1996. “Em busca de uma nova formação de professores”. In *Pesquisas em Ensino de Ciências e Matemática*, edited by Roberto Nardi, 60-72. Bauru: UNESP.
- Garcia, F., and F. Perez. 2000. “Los modelos didácticos como instrumento de análisis y intervención en la realidade educativa.” *Revista Bibliográfica de Geografía e Ciências Sociais*. Universidad de Barcelona 207. <http://www.ub.edu/geocrit/b3w-207.htm>.
- Gil-Pérez, D. 1991. “Qué hemos de saber y saber hacer los profesores de ciencias? (Intento de síntesis de la aportaciones de la investigación didáctica).” *Enseñanza de las Ciencias* 9 (1): 69-77.
- Gil-Pérez, D., and A. Carvalho. 1993. *Formação de Professores de Ciências: tendências e inovações*. São Paulo: Cortez.
- Guimarães, G., A. Echeverria, and I. Moraes. 2006. “Modelos didáticos no discurso de professores de ciências.” *Investigações em Ensino de Ciências* 11 (3): 303-322.
- Harres, J. et al. 2005. *Laboratórios de ensino: inovação curricular na formação de professores de ciências*. V. I. Santo André: ESETec.
- Harres, J. 1999. “Uma revisão das pesquisas nas concepções de professores sobre a natureza da Ciência e suas implicações para o ensino.” *Investigações em Ensino de Ciências* 4 (3):197-211. [http://www.if.ufrgs.br/ienci/artigos/Artigo\\_ID53/v4\\_n3\\_a1999.pdf](http://www.if.ufrgs.br/ienci/artigos/Artigo_ID53/v4_n3_a1999.pdf)
- Le Bon, G. 2005. *As opiniões e as crenças*. Edição Ridendo Catigat Mores.
- Machado, N. 1995. *Epistemologia e didática*. São Paulo: Editora Cortês.
- Mansour, N. 2013. “Consistencies and inconsistencies between science teachers’ beliefs and practices.” *International Journal of Science Education* 35 (7):1230-1275.
- Mellado, J. 1996. “Concepciones y práctica de aula de profesores de ciencias en formación inicial de primaria y secundaria.” *Enseñanza de las Ciencias* 14 (3): 289-302.
- Mellado, J. 2003. “Cambio didáctico del profesorado de ciencias experimentales y filosofía de La Ciência.” *Enseñanza de las Ciencias* 21 (3): 343-358.
- Novais, R., C. Siqueira, and M. Marcondes. 2011. “Modelos didáticos: um referencial para reflexão sobre as crenças didáticas de professores.” In *Anais do VIII ENPEC - Encontro Nacional de Pesquisa em Educação em Ciências and I CIEC - Congresso Iberoamericano de Investigación em Enseñanza de las Ciencias*, 9-23. Campinas: ABRAPEC.
- Peme-Aranega, C. et al. 2006. “Crecias explícitas e implícitas, sobre la ciencia y su enseñanza y aprendizaje, de una profesora de química secundaria.” *Perfiles Educativos* v. XXVIII 114: 131-151.
- Peme-Aranega, C. et al. 2009. “La interacción entre concepciones y la práctica de una profesora de física de nivel secundario: estudio longitudinal de desarrollo profesional basado en el proceso de reflexión orientada colaborativa.” *Revista Electrónica de Enseñanza de las Ciencias* 8 (1): 283-303.
- Porlán R., A. Rivero, and R. Martín del Pozo. 1997. “Conocimiento profesional y epistemológico de los profesores I: teoria, métodos e instrumentos.” *Enseñanza de las Ciencias* 15 (2): 155-171.
- Praia, J., D. Gil-Pérez, and A. Vilches. 2007. “O papel da natureza da ciência na educação para a cidadania.” *Ciência & Educação* 13 (2): 141-156.
- Santos, J., and M. Marcondes. 2010. “Identificando os modelos didáticos de um grupo de professores de química.” *Ensaio* 12 (3):101-116.

Silva, A. 2006. *Ensino e aprendizagem de Ciências nas séries iniciais: concepções de um grupo de professoras em formação*. Master (diss.), University of São Paulo.

[Back to contents](#)

## **Formal and non-formal: writing in shades of green**

*M<sup>a</sup> Conceição Antunes & Susana Margarida Caires*

*University of Minho, Portugal*

mantunes@ie.uminho.pt & s.caires.@sapo.pt

### **Abstract**

This essay follows the experience of a creative writing workshop and a workshop for illustration, developed in a Portuguese museum. The population had fifty primary schoolchildren and intended to develop reading and writing skills. Three guiding objectives were defined for our action: i) streamline educational activities that favour imagination and creativity; ii) enhance the development of skills of writing and reading; iii) raise awareness about the adoption of behaviours that help to preserve the ecosystem. As a research-action project, the planned activities were developed using methods and techniques that fostered the children’s active involvement and participation. The final evaluation revealed significant changes regarding the acquisition and development of reading and writing skills as well as creativity and significant behavioural changes in relation to the environment. The results of the project have turned up into a bilingual (Portuguese and Spanish) picture book, about Biodiversity.

**Keywords:** reading and writing skills; workshops; active methodologies.

### **Context of the research**

The Tales in Shades of Green project is a cooperative project between Portugal and Spain, implemented in the context of non-formal education - the Museum of Art of Fão of the Municipal council of Braga - for two groups of children (one Portuguese and one Spanish) attending primary school, which focused on promoting writing and reading skills based on a work of awareness for the preservation of the ecosystem.

The district of Fão is a community on the northern coast of Portugal, whose main activities are fishing and agriculture, which provide the basic means of living, indicating, nevertheless, a significant economic, social and cultural fragility.

Given these characteristics, while developing this project of education/training in an external educational context from the established one, we decided to focus on the issues of riverine biodiversity in order to approach the context of the participants’ lives.

The project we designed intended to promote new practices in the development of writing and reading skills, implemented in a non-formal educational context and operationalized based on meaningful themes for the participants, which favoured innovation and creativity. Effectively, in the case of this group, many factors indicate the difficulty of this effort, since this was a group of children with learning difficulties, poor school performance, low self-esteem, personal insecurity and problems with motivation.

Our work consisted mainly in the creation of two workshops, namely: the Creative Writing Workshop and the Illustration Workshop. Several types of recreational and educational activities were utilized in these workshops, which boosted the cognitive and intellectual capacities of this group of children such as creativity, innovation, writing, reading, reflection, memory, etc. This also increased awareness for the preservation of nature and strengthened the ties among the participants.

### **Research aims**

Three guiding objectives were defined for our action: i) streamline educational activities that favour imagination and creativity; ii) enhance the development of skills of writing and reading; iii) raise awareness about the adoption of behaviours that help to preserve the ecosystem.

## **Theoretical framework**

Potentially, every human being is creative, but not all of us develop this potential; creativity seems to be less accessible as we become adults. Anderson (1959, XII) states that “among children, creativity is universal; among adults, it is almost non-existent. The great question is: what happened to this enormous and universal resource?”. The answer seems to be rooted in the fact that education and, in a very particular way, formal education blocks the existing creative potential in each of us, instead of stimulating and developing it. The school culture that operates on structured information in the form of single and pre-defined national programs, obsessed with completing them to achieve pre-set goals, driven by the teaching of scientific content and inattentive to the acquisition, comprehension and application of skills, a culture where the classroom (the school grounds par excellence) becomes a linear route of communication (teacher to student) that nobody dares and/or is urged to interrupt in order to question, is radically incompatible with a “culture of creativity”. Reiterating the opinion of Bohm and Peat (1989, 301), we understand that “this blind submission to the “programs”, set in the tacit infrastructure of consciousness, is the primary obstacle to the full manifestation of creativity”. Most researchers are in agreement that the creative potential that exists in each of us begins to be inhibited when we enter school. Winnicott (1989, 32) goes as far as stating that “creativity is the maintenance, through life, of something that belongs to childhood experience: the ability to create the world [...]”. Nowadays, “projects of increasingly greater research demonstrate the importance that education can play in the development of an effective creativity” (Parnes, quoted in Beaudot 1980, 156). Torrance (quoted in Taylor 1961) in a text which already dates from the early 1960s, entitled “Status of Knowledge Concerning Education and Creative Scientific Talent”, urges us to encourage creativity through active pedagogical practices that encourage students to discover and to construct knowledge for themselves. Novaes (1982, quoted in Saturnino de la Torre 1982, 22) corroborating with many other authors considers that

“highlighting the dimension of creativity in education mainly implies promoting creative attitudes, stimulating individual potential, favouring originality, the appreciation of what is new, invention, individual expression, curiosity and awareness of problems, receptivity to new ideas and the perception of self-direction.”.

It was taking into account the ideas that we have been presenting and believing that the techniques of active and participative methodology favour learning experiences that promote the development of creativity and forms of construction of knowledge and meaningful learning that we created the “Tales in Shades of Green” project.

## **Research methodology**

The reasons that motivated this educational project indicated convenience to implement some types of activities, departing from the procedures and dynamics of school education and meeting, at least partially, some of the needs detected by implementing a compatible plan of action. Given that “it is the ends that, in effect, give practice its consistency, and that ultimately validate it” (Malglaive 1995, 74), we outlined the purpose of the project - the promotion of writing and reading skills based on a work of awareness for the preservation of the ecosystem. To this end, we defined goals, “principles that guided the team’s efforts, which were developed to contribute towards the achievement of the project’s aim” (Randolph and Posner 1992, 29), i.e., principles that provided us with guidelines for the plans and programs of the work, showing the course of the project in more detail. These are: i) streamline educational activities that favour imagination and creativity; ii) enhance the development of writing and reading skills; iii) raise awareness about the adoption of behaviours that help to preserve the ecosystem.

## ***Participants***

The participants of this project consisted of fifty primary school children, 29 females and 21 males, aged seven to nine years old, attending the 3<sup>rd</sup> and 4<sup>th</sup> grade. It was a group of children from

a vulnerable socioeconomic and family background, with little participation and encouragement from parents in regards to school life, affective-emotional problems (insecurity, aggression), language and learning difficulties and challenges in interpersonal interaction and peer relationships.

### ***Method and Techniques***

Considering that, as Paulo Freire states (1975), nobody educates anybody, nobody educates themselves, people are educated in fellowship, and education/training is a process of participatory self-training, we opted for the methodology of participatory-action-research that simultaneously applies the process of knowing and the process of intervening and involves the active participation of the population (Ander-Egg 1990). The advantage of this methodology for our project is that it promotes and provides everyone - investigators and participants - an understanding of the reality and the identification of resources and capabilities, generating knowledge that can promote and streamline available resources that favours the transformation of the existing reality, i.e., in this case, improving reading and writing skills and nurturing the creativity of the target population. With this ideal outcome in mind, we fostered a climate of co-responsibility of all participants, involving them in the project, from needs analysis, to design, to its implementation and evaluation. After the search of understanding the context of intervention and identification of existing needs and capabilities, in an environment of empathy and dialogue, we planned a program of sustained action on the origins and livelihoods of the participants - the creation and illustration of a tale on the theme “Riverine biodiversity” that the children titled No more pollution. We always had the concern of promoting democratization and socialization of knowledge gained through the transfer of knowledge (knowledge that is shared) and social technologies (performance capabilities that are acquired) to “promote knowledge and foster the development of skills required to the subject-actors for an effective and active participation in the project” (Ander-Egg 1990, 34). We set out, therefore, to provide the tools, knowledge and skills required for children to participate effectively in the development, drafting and illustration of the tale. With this aim, we conducted a series of fun activities and artistic expression activities, as they can “facilitate expression, constitute forms of initiation or development of creative languages, increase the capacity for innovation and prompt the search for new forms of expression” (Ander-Egg 2000, 339). For the development of the research/intervention process, we used a range of instruments or techniques as rigorous surgical procedures that make research feasible (Carmo, 1998). We utilized the following research techniques:

- bibliographic research that yielded further information on the topic of education and environmental preservation;
- ii) participation in meetings with professionals of the Art Museums and of the Office of Environmental Education which provided a set of relevant information relating to the theme of riverine biodiversity;
- iii) informal conversations with the children’s teachers who helped us get to know the children with whom we would work;
- iv) direct observation of the children while they viewed slide shows of landscapes and elements of nature as well as during a trip to the river, which allowed us to capture their behaviour “the moment they produce themselves, without the obscurity of a document or of a witness” (Quivy and Campenhout 1992, 197). This direct observation of the actors helped us understand their knowledge, attitudes, behaviours and sensitivity to the need to preserve the ecosystem. Aware that direct observation may be limited by the subjective horizon of the researcher, we opted to supplement it with;
- v) informal contacts and conversations with the children, through which it was possible to understand some of their difficulties and to assess their opinions, knowledge, information and relative sensitivities to the issue of environmental sustainability. The informal conversations also allowed us to establish a relationship of empathy and trust with the actors, which yielded a truer and more fruitful interaction;

- vi) a questionnaire was applied to the children and a semi-structured interview to two teachers in order to do the final evaluation of the project.

As for the techniques of education/training, we utilized a set of social, educational and artistic techniques belonging to the methodology of realization of sociocultural activities, following the guidance of Ander-Egg (2000): i) Group techniques utilized to develop the effectiveness and potential of the group. These techniques were used at the beginning of the activities when the guiding principles of teamwork were defined, such as sharing information, creating teams and the definition of roles between participants; ii) Technical information and/or communication utilized more specifically in the Creative Writing Workshop where, in addition to oral communication, we often resorted to audio-visual materials, flyers, posters, magazines, etc.; iii) Techniques or procedures for conducting artistic activities primarily used in the Illustration Workshop, where we developed drawing, painting, DIY, etc. with the purpose of illustrating the book.

### *Procedures*

To facilitate the implementation of the project, the Museum of Art and the Environmental Education Service of the Municipal Council of Braga partnered with the School EB1/JI Ramalhão of Fão and the Colégio Concertado de Santa Rafaela Maria, in Madrid. After the establishment of the partnerships, and in order to meet these children’s educational needs, interests, capabilities and expectations, we conducted a detailed analysis of the reality in which they lived to better identify their main problems and interests. We conducted a set of activities that allowed us to talk, play and interact with the children, gaining their trust and empathy. As mentioned before, it was a group of children from disadvantaged backgrounds, with poor academic performance and little incentive and motivation for learning. To draw a plan of action based on the needs detected, we collaborated together (researchers, teachers and children) and, after an extended debate, we agreed with the design of a program capable of improving the issues of language, learning, interaction and interpersonal relationship, relationship with nature and its preservation. Based on a feasibility study, we decided to develop the project “Tales in Shades of Green”, through the implementation of a workshop of creative writing and a workshop of illustration that would have, as their purpose, the writing and illustration of a bilingual - Portuguese and Spanish - children’s picture book on the theme of Biodiversity.

#### *The creative writing workshop*

After we took the necessary steps with the teachers of the School EB1/JI Ramalhão of Fão, it was agreed that the workshop on creative writing would have a duration of approximately two months, at the Museum of Art of Fão, two mornings a week and that it would be attended one morning by a group of 22 4<sup>th</sup> graders and another by a group of 28 3<sup>rd</sup> graders.

The Creative Writing Workshop sought to be a place of conviviality and non-formal education/training “stimulating of communication, participation and creativity” (Ventosa 1997, 90), where children could develop educational practices based on “learning by playing” and “learning by doing” (Dewey 1959). In this regard, entertaining educational activities that promoted innovation and creativity were developed to achieve educational goals and learning.

We started the workshop by devoting some sessions to the phase of awareness and assessment of the needs to be addressed and of the existing resources. For this purpose, we chose activities that would promote communication, dialogue and interaction and that stimulated the organs of sense and creativity, such as the viewing of slide shows depicting the river and coastal areas of Fão and Esposende, activities of handling elements of nature of these same areas, and a trip to the river. With these active techniques, we sought to start from the children’s reality and experience, developing their sensitivity of the environmental context where they live and engaging them with sensory (visual, auditory, olfactory and tactile sensations alluding to river and coastal areas) and emotional inputs, so that they would feel motivated to actively participate in the project. During the writing workshop, we chose experiences that would encourage interaction, autonomy, capacity to listen and negotiate, and creativity, involving and including them in all decisions to be

made: the choice of the title of the tale, the context in which it arose, the characters and their names, the problem, supporting and opposing factors of the solution of the problem and the end of the story.

We pledged to make this workshop an educational place of integral development, a place where the educational processes achieved would result from the synergistic action of different constituent elements of the same place, i.e., resulting from a holistic activity (Puig and Trilla 1996).

Agreeing on the idea that “there is only knowledge in invention, in reinvention, in the restless, impatient and permanent search” (Freire 1975, 83), we were led to follow these dynamics, motivating and driving the children to launch in this restless search, in the invention, in the possibility of reinvention and of (re)description, in the creation of our tale. Thus, through the techniques of brainstorming and group dynamics, the facilitator of the workshop guided the structure while the children created the story step by step in an individual/joint methodology.

We sought to foster imagination and creativity, leading the children to create a unique story and, thus, to recreate, reinvent and (re)describe reality but, simultaneously, we also encouraged the development of skills of reading and writing and the enrichment of vocabulary, since each participant wrote their suggestions and then read them aloud to the group. Interpersonal relationship skills, listening, respect for others and negotiation were also a focus, since, once the suggestions of each participant were presented, the group had to agree on the best idea.

In this place that promoted self-education, which we named the Creative Writing Workshop, we invested on a horizontal pedagogical relationship, which promoted active participation, dialogue, constructive criticism and creativity where we sought to foster a (non-competitive) cooperative interaction based on a process of dialogic communication. To this end, we invested in the implementation of an intervention model of “autonomous development”, where children became subject-actors and protagonists of their own development. This was an educational place where we always tried to take into account the children’s needs, promote the dynamics of the group through their common interests and needs, enabling the creation of ideal times for participation and creating meeting places where children could discover their potential and individual capacities (Castro 1990).

### *The illustration workshop*

The Illustration Workshop integrated several sessions and was held at the Municipal Museum of Esposende. As with the Creative Writing Workshop, here we also focused on sociocultural animation as an effective strategy for non-formal education that enables the extension of the educational processes to social and cultural places other than those characteristic of the formal education system.

Through visual arts, children, supported by the facilitator, drew the tale’s characters and gathered the material for the illustration (newspapers, magazines, fabrics, building materials, used items and objects collected from the riverine environment - stones, plants, sand, shells, etc.). Once collected and cut, the material was stretched out on a large table and the agent-actors launched in the illustration work by choosing and employing the materials they wished. The children participated in all the activities; they all contributed in the illustration of each of the characters and the surrounding environment.

In this creative educational environment, children had the opportunity to experience, share, recreate, reinvent, fantasize and express emotions, feelings, affections and knowledge in an open and constructive manner. The imagination and the ability to create allowed for the improvement of their personal taste, intuition, fantasy and reflection on the background themes that were being worked on. As in the creative writing workshop, here too was an ongoing evaluation of sessions that proved to be an important tool because whenever a session did not produce the expected results, the methodology was rethought, refocused and changed to better suit the characteristics of the subject-actors so that activities would effectively promote development and enrichment.



## Findings

In order to do the final evaluation of the project, a questionnaire was applied to the children and a semi-structured interview to two teachers. Regarding the children's answers to the questionnaire, in the first question - if they liked to participate in the activities and if they were up to their expectations - all the children (N=45) have said “yes”, and considered that the activities met their expectations because they were “interesting and fun” (Q5) and promoted “the enthusiasm to learn and know more” (Q17). Regarding the question about if they have learned something new, the group of children unanimously considered so. When we tried to find out what they have learned, the categories that emerged from their responses were “writing” (N=38); “reading” (N=37); “vocabulary” (N=32); “painting and illustration” (N=28, “pollution” (N=28) and “biodiversity” (N=23).

On the question if activities helped them to improve their school performance, again the opinion of the group was affirmatively unanimous: “yes”. Their justifications were the fact that they have learned “many new words” (Q29); they learned “to be creative and use your imagination”; “new vocabulary” (Q35); “to read more correctly” (Q14); “to write without mistakes” (Q5) and “to paint and illustrate” (Q10). As stated “everything that we've learned ended up to be advantageous” (Q4), or “all helped us to become better students” (Q 23).

With regard to the question if the project has contributed to some changes and which, all children responded affirmatively. The group interpreted the project as having brought changes to their daily life, contributing to “the improvement of school performance” referred by 32 children. It was also pointed out the importance of the project in the “improvement of interpersonal relationships” reported by 28 children. In the words of a child, the participation in the project “improved the relationship with my colleagues and teachers” (Q3).

On the question about if they considered that it would be important to continue the activities, all children responded positively, noting that “there is still much to learn” (Q5, Q11, Q17, Q19, Q24, Q32, Q39).

As for the interview with the two teachers, their answers to the 1st question “How do they evaluate the project” 4 categories have emerged: “positive project”, “increased knowledge”, “proud of”, “new dynamics and new responsibilities”. As stated by a teacher, it is a project in which “everything can be considered positive”; it has contributed to an “increase of knowledge” (Ent.1). In other words, one of the teachers said that this project “is a pride for all; children have acquired a lot of knowledge and new dynamics and new responsibilities have emerged (...) from what children echoe it appears that they are happy, lively, and enjoy learning this way: more practical and informal” (Ent.2).

Regarding the 2nd question “Can you identify significant changes in children? What? The following categories have emerged: “improvement in writing and reading”; “more commitment and creativity in activities”; “more proactive”; “more skills in teamwork”. As stated, “some children who had more difficulties now reveal better writing and reading skills” (Ent.1), “there is a growth, further development in writing and reading, better vocabulary” (Ent.2). On the issue: Consider this type of project an important partnership of formal education? The two teachers answered positively: “yes, of course, now that I've had the opportunity to follow this experience I understand the advantages much better. I've never imagined that some of the children were able to do what they did ... and with enthusiasm and commitment ... is another way of learning” (Ent.1 ). “There is no doubt that the project is evidence that the more participatory learning methodologies are the more students adhere ... is the jump that we still lacked” (Ent.2).

## Conclusions and implications for teacher education

We believe that the results achieved with the “Tales in Shades of Green” project, the illustrated book No more pollution, revealed that non-formal education and, in this case, the sociocultural animation is a type of educational intervention (Úcar 2006; Ventosa 2007) ideal for promoting personal/collective development in areas where formal education has often been unable to obtain very positive results. Distinguished from other models of intervention by the way and

attitude with which it is performed, i.e., by the goals and procedures it uses, sociocultural animation seeks to foster autonomy and personal empowerment, encouraging an effective participation of human beings in shaping their own future (Serrano 2007).

Embracing sociocultural animation as a strategy of intervention, this project involved the children in activities where they themselves would build the desired knowledge and skills. The project raised awareness, informed and educated on issues related to biodiversity and environmental education, and promoted actions and initiatives that boosted writing and reading skills, enhancing the knowledge and behaviour of the subject-actors.

Sharing the opinion of Saturnino de la Torre (1997, 99), where he states that “the creative person is able to go beyond what he has learned, to overcome the present reality”, we motivated children to invent and write a tale that would create awareness for the preservation of the ecosystem.

Starting from the knowledge that creative potential exists naturally and that human beings are born endowed with such potential (Bohm and Peat 1989), we sought to, fundamentally, give space and encourage the children’s spontaneous creativity, give wings to their creativity, give them attention, value the story they were inventing and show them that their ability to create and imagine was appreciated, thus encouraging them to trust and to boost their creative potential.

The story that children invented, wrote and illustrated is a concrete example that Winnicott was right when he stated that “a creative experience does not require any special talent [...] creativity is inherent to being alive” (Winnicott 1989, 35). Despite some reading and writing difficulties, in a stimulating environment, these children achieved an outstanding job in terms of innovation and creativity. The climate of free creation adopted resulted in the satisfaction with which the children were involved and participated in the workshops demonstrating that, effectively, as Bohm and Peat (1989, 305) state, “creativity is not only common to all humans, it is also a primary need, and its negation leads to a state of deep dissatisfaction and annoyance”. It is this incentive to self-training, to genuine self-creation, to the instigation of the creative potential that exists in each of us, that should be the goal of all educators. Because “there are no exceptions to this rule. Creativity is a universal characteristic of self-actualizing individuals” (Maslow 1964, 31). Helping young people to become creative and, therefore, integrated and fulfilled people, means to help a generation learn how to creatively address problems in a world of constant transformation. This is indeed the ultimate purpose of education. Alexander’s words in the 1970s are today acquiring their full significance,

“little by little, people are realizing that the main strength of a nation lies not in its coal, iron or uranium, but in the ability of its young people for creative originality. Soon, everyone will agree that people without creativity are doomed to slavery” (Alexander 1960, 329).

In our opinion this project focusing on innovative and active methodologies had important implications for teacher education, it restated the importance of active methodologies and effective involvement and participation of students in their education and learning process, enhancing innovation, creativity and the children’s whole development. We have a very clear perception that our intervention was a very modest contribution in promoting cognitive and intellectual skills in education. Broader measures, which pass through the formal education system, should be taken so that, through active and participatory pedagogies, children may find a learning climate favourable to developing their imagination/creativity and not the opposite. However, we are satisfied with having contributed to the construction of one more reinvention, (re)description, recreation of reality, the fruit of the imagination and creativity of these great little actors/authors and with having provided them an opportunity to believe in their potential, increasing their knowledge, their self-esteem and desire for social participation.

## Acknowledgements

This work received support from National Funds through the “FCT - Fundação para a Ciência e a Tecnologia”, within the context of the project PEst-OE/CED/U11661/2014 of the CIED-UM.

## Endnotes

1. Although the project integrates two target groups, this presentation will only refer to the work done with the Portuguese group.

## References

- Alexander, F. 1960. *The western mind in transition*. New York: Random House.
- Anderson, H. 1959. *Creativity and its cultivation*. New York: Harper.
- Ander-Egg, E. 1990. *Repensando la investigación-acción participativa*. México: Editorial Ateneo.
- Ander-Egg, E. 2000. *Metodología e práctica de la animación sociocultural*. Madrid: Editorial CCS.
- Beaudot, A. 1980. *La creatividad*. Madrid: Narcea.
- Bohm, D., and D. Peat. 1989. *Ciência, ordem e criatividade*. Lisbon: Gradiva.
- Dewey, J. 1959. *Democracia e educação*. S. Paulo. Companhia Editora Nacional.
- Carmo, H., and M. Ferreira. 1998. *Metodologias da investigação - guia para auto-aprendizagem*. Lisbon: University Aberta.
- Castro, À. 1990. *Tiempo de ocio y cultura. Proyecto y experiencia de animación cultural*. Madrid: Narcea.
- Freire, P. 1975. *Pedagogia do oprimido*. OPorto: Afrontamento.
- Malglaive, G. 1995. *Ensinar adultos. Trabalho e pedagogia*. OPorto: Porto Editora.
- Maslow, A. 1964. *Motivación y personalidad*. Barcelona: Sagitario.
- Puig, J., M. Martínez, and J. Trilla. 1996. *La pedagogía del ocio*. Barcelona: Alertes.
- Quivy, R., and L. Campenhout. 1992. *Manual de investigação em ciências sociais*. Lisbon: Gradiva.
- Randolph, W., and B. Posner. 1992. *Planeamento e gestão de projectos*. Lisbon: Editorial Presença.
- Saturnino de la Torre. 1982. *Educar en la creatividad*. Madrid: Narcea.
- Saturnino de la Torre. 1997. *Innovacion educativa - el proceso de innovación*. Madrid: Editorial Dykinson, S. L.
- Serrano, G. 2007. “Qué es la animación sociocultural? Síntesis y conclusiones del 1º Foro Electrónico Iberoamericano sobre ASC”. In *Educación social, animación sociocultural e desarrollo comunitario* edited by X. Cid and A. Peres, 197-205. Vigo: University of Vigo, University of Trás-os-Montes e Alto Douro.
- Torrance, E. 1961. “Status of knowledge concerning education and creative scientific talent”. In *Working paper for a project on the status of knowledge about creative scientific talent*, edited by C. Taylor. Utah: Utah University Press.
- Ùcar, X. 2006. Presentación. In *La animación en la comunidad*, edited by J-Cl. Gillet, 5-8. Barcelona: Grào.
- Ventosa, V. 2007. “De que hablamos, quando hablamos de animación sociocultural? Síntesis y conclusiones del 1º Foro Electrónico Iberoamericano sobre ASC”. In *Educación social, animación sociocultural e desarrollo comunitário*, edited by X. Cid, and A. Peres, 271-280. Vigo: University of Vigo, University of Trás-os-Montes e Alto Douro.
- Ventosa, V. 1997. *Intervención socioeducativa*. Madrid: Editorial CCS.
- Winnicott, D. 1989. *Tudo começa em casa*. São Paulo: Martins Fontes Editora.

[Back to contents](#)

## **“Back to the future”: science fiction as a part of teaching contents of natural sciences - a teaching idea from an ex-Yugoslav school**

*Milan D. Stojković*

*Friedrich-Schiller-University of Jena, Germany*

milan.stojkovic@uni-jena.de

### **Abstract**

Historically, science fiction (SF) and natural sciences share common origins. From the classical period and first works of science and philosophical debates imbued with elements of fiction, through medieval and new century works - founders of natural sciences - to modern SF writers and scientists, SF and natural sciences have been interwoven and have complemented each other. In the mid-20th century SF became the subject of numerous pieces of research, especially the existence of close links with the natural sciences as well as the implementation of SF contents in teaching science. This paper considers the possibility of implementing contents of SF literature and film in teaching natural sciences, based on the ideas of the former Yugoslav school and students' opinion. The results of a survey from the Camp of Physics “Soko Banja 2014” for elementary and secondary schools in Serbia are also presented.

**Keywords:** science fiction; science fiction literature; natural sciences.

### **Context of the research**

Numerous studies (surveys) conducted in schools throughout the USA and Europe have shown that watching science-fiction series - for instance, Star Trek - is considered highly useful by students because it helps them with studying and understanding natural sciences at school (Brent Spiner On BBC Breakfast 2010).

After World War II the idea of introducing SF into natural science subjects, possibly as an individual subject, emerged among SF writers and scientists in both western and eastern European countries. In the former Yugoslavia, in the period from the 1960s to 1990s, SF was given a special place within the school TV programme, which was based on the curriculum, scientific-popular literature and school magazines (Stojkovic 2013). This was primarily evident in the broadcasts of the school TV programme as well as school magazines, dealing with popular science, SF literature and film.

### **Research aims**

The main aim of this work is to provide a historical overview of the development of SF, primarily SF literature, its connections with natural sciences, as well as their mutual influence, from the ancient to the modern period. What will also be discussed is the special position that SF occupies within natural sciences, a science teaching idea from an ex-Yugoslav school, as a part of school TV programme, scientific-popular and SF literature.

The other aim of the work is to report on a survey conducted within the lecture “Natural Science as Part of SF Literature and Film” for students of primary and secondary schools, participants of the Camp of Physics 2014 in Soko Spa (Serbia). The results and opinions of the camp participants (students) on the introduction of SF elements in teaching natural sciences will be presented, analysed and discussed.

Generally, the paper will consider the possibility of implementing contents of SF in the teaching of natural sciences, primarily the possibility of introducing SF as an elective or optional course in schools, based on ideas of a former Yugoslav school and the results of the conducted survey (students' opinion).

## Theoretical framework

### *An overview of SF literature within natural sciences*

Chronologically, the first author who studied the connections between science fiction and science was American biochemist and SF writer Isaac Asimov (1920-1992). In his articles, although they do not represent research publications in the proper sense, published in the 50's and 60's of the 20th century (Asimov 1953, 1954, 1955, 1956, 1959, 1961 and 1968 cited in Schneider 2007), Asimov (1953, 1954, 1955, 1956, 1959, 1961 and 1968) presented the idea of the popularisation of science through literary SF genre. In the following decades, these topics were dealt with by the authors from North America, Anglo-Saxon countries (mainly Commonwealth countries) and Western Europe: the works of German authors presented the position of literary SF in both Germany BDR (eng. FRG) and DDR (eng. GDR), and the impact of foreign SF genre (Suerbaum, Broich, and Borgmeier 1981). Some time later, American authors dealt with the importance and impact of SF on students' interest in studying science (Dubek et al. 1990; Dubek and Tatlow 1998), and also SF series (Star Trek), or the contents of SF series which can be applied in science teaching (Dubek and Tatlow 1998). At the beginning of the 21st century, the main subjects of research in the field of SF were: the use of SF in physics teaching through film art (Dubek et al. 1990; Freudenrich 2000), the use of the contents and ideas of SF in the development of writing skills by students (Finch 2000), an overview of the most important SF literary works for high school students (Pierce 2001), the connections of scientific discoveries, science and science fiction, as well as the implementation of the contents of SF in teaching science (Raham 2004), the connection of literature, sci-fi, fantasy and science, and development and realisation of the seminar and workshop on this topic (Czerneda 2006). Lately, the European and American authors have extended the area of research: the life and work of Isaac Asimov as a scientist and science fiction writer (Schneider 2007), the contents of SF within the school TV programme in the former Yugoslavia, scientific and popular papers (Stojkovic 2013) and the use the contents of SF in understanding the contents of biology (evolution theory) (Rohrbacher 2013).

Generally speaking, there are fewer articles on SF in natural sciences published by European authors (Suerbaum, Broich, and Borgmeier 1981; Schneider 2007; Stojkovic 2013) who are engaged in the research of the influence of SF genre on teaching science in Europe in comparison to the countries of North America and the Commonwealth in the period of the late 20<sup>th</sup> and early 21<sup>st</sup> century (Asimov 1953, 1954, 1955, 1956, 1959 and 1968; Dubek et al. 1990; Dubek and Tatlow 1998; Finch 2000; Freudenrich 2000; Pierce 2001; Raham 2004; Czerneda 2006; Rutherford 2006 and Rohrbacher 2013).

### *Connections between SF and natural sciences*

#### *Fantasticalness of natural sciences*

To better understand the links between science fiction and natural science and also their mutual influence (not just SF as a genre in the field literature and film), it is necessary to present the historical development of SF, science, and literary works of various philosophers, scientists and writers. Epochs of SF and the most important works are from: the Roman Age to 1914 - Frankenstein; 1918 to 1945 - Metropolis; 1945 to 2014 - Star Trek (Hector n.d.).

The first epoch for a period of almost 2000 years, from the classical period to the late 19th and early 20th century, was marked by the works and ideas of philosophers, scientists and writers of scientific or hard SF. One of the first works in the field of SF comes from the classical period. The rhetorician and satirist from the Ancient period, Lucian of Samosata (125-180/200), in his work “The True History I and II”, described a fantastic journey through the universe (Jovanović 2010). In the late Middle Ages, German physicist Friedrich Johannes Kepler (1571-1630) published the work “Somnium”, where he described the biosphere of the Moon and its inhabitants (Hector n.d.). Sometime later, German writer Hans Jakob Christoffel (1622-1676), in his book “Simplicissimus”, described a utopian society and a journey to the Moon (Hector n.d.). Discoveries

in natural sciences in the late 18th and early 19th centuries inspired Mary Shelley (Figure 1) to write the first modern SF novel “Frankenstein” (Shelley, 1816/18). Mary Wollstonecraft Shelley (1797-1851), the author of the novel Frankenstein (Figure 2), found the idea for writing this novel in scientific discoveries: in biology - the research and ideas of Erasmus Darwin (1731-1802), in physics - electricity – Volta’s battery, Italian scientists Alessandro Volta (1745-1827) and in chemistry - obtaining complex compounds, the scientific work of German theologian, physician and alchemist Johann Konrad Dippel (1673-1743) (Nedeljković 2010; Hector n.d.).



Figure 1. Mary Wollstonecraft Shelley (1797–1851)<sup>1</sup>

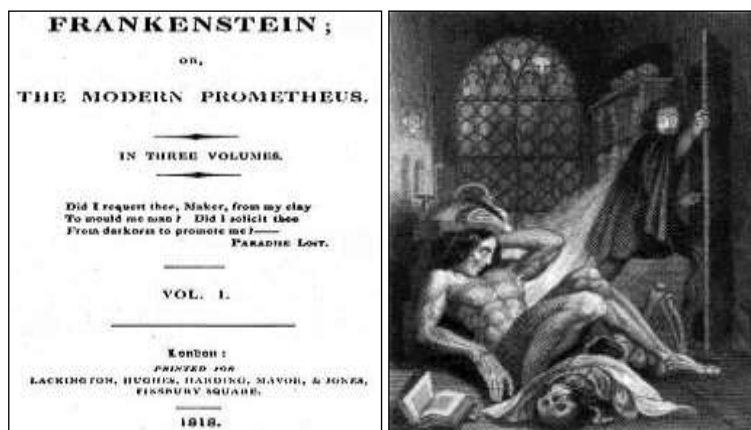


Figure 2. The first modern SF novel “Frankenstein” or “The Modern Prometheus” (1818)<sup>2</sup> (Picture, left); The frontispiece of the novel “Frankenstein”<sup>3</sup> (1831) (Picture, right)

The most important representative of hard SF at the end of this epoch and the most influential SF author was Jules Verne (1828-1905), who transformed the scientific ideas of the industrial revolution and the technological achievements of the 19th century (Hector n.d.) into the most important classic works of literature and science fiction in general.

What is characteristic for the second epoch, between the two World Wars, is the development of film SF as a genre: there are the films Russian and German cinematography: “Aelita” (1924) (Aelita Queen of Mars NTCS 2012), “Metropolis” (1927), “Woman in the Moon” (1929) (Hector n.d.) etc. These works represent a futuristic vision of the development of human civilisation and social systems on other planets, as well as the development and implementation of new technical and technological achievements aiming at the space travel and its research.

The third epoch, a part of the rapid development of hard SF, marked the further development of the TV science fiction, which began with the production of one of the most popular science fiction series in the second half of the 60 years of the 20<sup>th</sup> century (Star Trek according to the book by American screenwriter Gene Roddenberry, 1921-1991) (Memory Alpha Gene Roddenberry n.d.). The most important representatives of literary SF genre in the period from 1945 to present days are: Arthur C. Clarke, Isaac Asimov, Frank Herbert, Ursula Le Guin, Ray Bradbury etc. (Janson 2009). In their works, these writers deal with issues of further development of human society in the

near and distant future, the development of robotics and computer technology, cosmonautics, science, space exploration, discovering other forms of life and the establishment of contact with intelligent life forms and their influence on the development of human society.

At that time, in the former Yugoslav schools, within the teaching natural sciences, a special place was dedicated to science fiction. Since the former Yugoslavia did not belong to any former political-military bloc in Europe, it developed its own school system and curricula, though influenced by other west European and east European school systems (Vajgand 1971, and Pari 1972 cited in Bojović 2009). This influence was manifested in the field of SF genre.

In the period from the 70s to the 90s of 20<sup>th</sup> century, several shows for students and youth, dealing with the topic of SF, were broadcast within the common Yugoslav school programme. These were the following shows: “The Starry Screen” (Serb. “*Zvezdani ekran*”) (Stojkovic 2013) and “The Book Is To Be Read” (Serb. “*Knjiga je da se cita*”) (Zlatna knjiga *Knjiga je da se cita* 2010). They dealt with SF film and literary genre such as SF films from the US and Soviet cinematography based on SF literary works (works by Jules Verne, Herbert George Wells, Mary Shelley, Arthur Clarke etc.). At the time, contents of the TV school and educational programme were based on the curricula of natural sciences for primary and secondary schools in the former Yugoslavia.

Apart from the school TV programme, school magazines (“Children’s Newspaper” - Serb. “*Decije novine*”) and scientific-popular magazines (e.g., “*Politikin Zabavnik*”, and the “*Galaxy*” - today magazine “*Planet*”) (Stojkovic 2013) also dealt with SF literature and SF comics. Thus, SF contents became an integral part of both TV school-educational programme and scientific-popular literature and school magazines.

## **Research methodology**

### ***Purpose of the empirical study***

With the aim of reviving and restoring the ideas that derived from the former Yugoslav schools and classes in terms of SF, a lecture was given, with title “Natural Sciences as Part of SF Literature and Film” within the Physics Camp for students and teachers of primary (1-8 grade) and secondary (grade 1-4) schools in Soko Banja<sup>4</sup> (Serbia) in January 2014. The basic idea was to test the opinion of students and participants in a school camp physics about SF, as part of the natural science and its implementation in science teaching. The lecture presented the historical development of SF as a genre and the links with science fiction, with appropriate examples from SF literature and film.

### ***Participants***

The total number of participants in the Physics Camp was 120 (students and teachers), while the total number of participants in the survey was 68 (students of primary and secondary schools). Of the total number of participants of the Physics Camp, the questionnaires were completed only by those who had attended the lecture.

### ***Data collection***

After the lecture the participants were asked to answer the following survey questions (see Findings: Questions from the questionnaire-Question Nr. 1, 2 and 3). For this purpose, a short questionnaire had been designed (end-of-session-questionnaires). It was comprised of open-ended questions. The great number of the participants of the Physics Camp and their age were taken in consideration when preparing the questions and the open-ended questionnaire.

After the survey of the Physics Camp participants had been conducted, an analysis of the questionnaire was performed. The data of the questionnaire were coded by the lecturer (researcher). After the coding procedure, codes were organised in several categories (themes). During the coding procedure, special attention was paid to age, literary skills, previous experience of the students and

everyday knowledge concerning this topic.

In question number 1, which consists of two interrelated sub-questions, students provided simple and short answers. They were primarily divided into those who became familiar with this topic through reading SF books and watching films and series, and those who were not familiar, i.e. who had not read a SF book or seen a film or series, i.e. met SF contents in everyday life. A small proportion of the interviewees did not answer this question. For example: Yes, I am familiar with SF genre; I have read the following SF books/following SF book..., I have seen SF films and series...; No, I am not familiar with this genre; I haven't read any SF book/novel so far; I haven't seen any SF film/series. In this case (question number 1), according to the analysed data, two categories can be identified: (1) familiar with contents and (2) not familiar with SF contents. Naming these two categories as SF fans, opponents or anti-fans would not be appropriate. Students of primary and secondary schools are concerned here, and having in mind their experience, one could say that their knowledge of the SF genre is not wide enough to characterise them as fans or followers of this genre. For the ease of data processing and presenting within question number 1, the category of those familiar with the contents of SF was renamed to yes, while the category of those not familiar with the contents of SF was represented with no.

The data obtained from the survey were analysed using Excel programme. A pie chart was created for each question, accompanied by data and text - explanation.

## Findings

### *Analysis of the questionnaires*

The opinions of the participants (students) clearly speak in favour of the importance of SF and its broader, deeper and more intensive application into the domain of science teaching in primary and secondary education, which was confirmed by the analysis of the questionnaires. However, as this is a small sample of interviewees (students), it would be necessary to conduct, in the near future, further research on this subject in schools in Serbia and abroad, in order to obtain a clearer picture of the possibilities of implementing elements of SF within teaching science. The research could also be expanded on the teaching of social sciences, especially literature - above all, in terms of the teaching contents of social sciences and their correlation with the contents of natural sciences, when it comes to the contents of hard or scientific SF literary genre.

*Question Nr. 1: Are you familiar with SF? Have you read any SF work or seen a SF film/TV show-name them?*

The first question of the questionnaire includes two sub-questions closely related to the familiarity with SF as a literary or film genre (Figure 3). More than two-thirds of participants stated that they were familiar with SF genre through literature; they were also familiar with SF genre thanks to films and TV series, and video games. About one-tenth of the participants said that they did not know what SF genre was, while less than 10 percent did not answer these questions. Nowadays, students find out more information about SF via electronic media, the Internet and computer games, in terms of the literary form of science fiction.

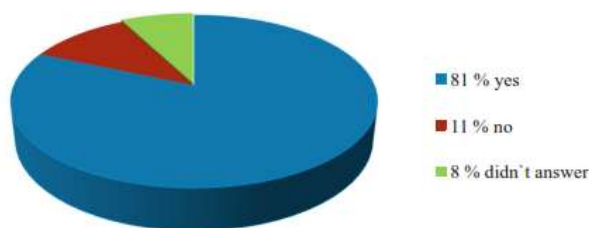


Figure 3: Question Nr. 1 - Are you familiar with SF? Have you read any SF work or seen a SF film/TV Show-name them?



*Question Nr. 2: In your opinion, how could the contents of SF be applied in teaching natural sciences?*

The second question is related to the possibility of introducing the elements of SF in teaching science (Figure 4). More than half of the students considered that contents of SF could be applied through a similar lecture on this topic. A small number did not understand the question or did not know how it could be implemented in teaching science. Interestingly, though, slightly more than 30% of students did not answer this question. At least some of this group belongs to the part of those who are familiar with SF as a genre (Question 1). Even when they know what SF genre represents, students do not have the knowledge or assumption to envisage the way it could be implemented in teaching science.

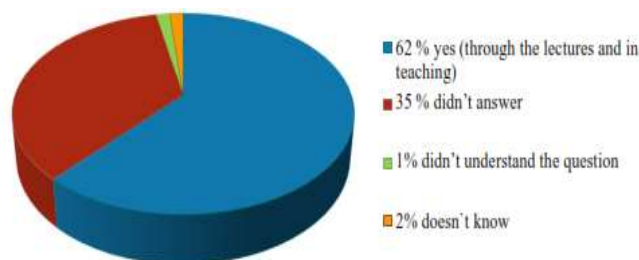


Figure 4. Question Nr. 2 - In your opinion, how could the contents of SF be applied in teaching natural science?

*Question Nr. 3: What is your opinion of the lecture on SF in natural sciences?*

The third question is related to the opinion of the camp participants on SF in natural sciences (Figure 5). Many of the students also found the SF genre highly interesting (approaching a half), although slightly more than half of the interviewees did not answer question III. This percentage certainly belongs to those who know what SF is (Question 1) and how elements of SF could be applied in teaching science (Question 2). About half of the students did not answer, but only a small number declared that they were not interested in the SF genre (corresponding to the same percentage of students within Question 2 who did not understand the question and did not know how it could be implemented).

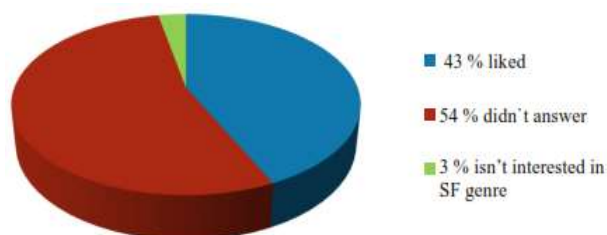


Figure 5. Question Nr. 3 - What is your opinion of the lecture on SF in natural sciences?

Analysis of the answers showed that most students knew what SF as a literary and film genre is (Figure 3). They also showed familiarity with the most important - mostly classic - and work of scientific SF (Figure 3). The students found most contents from the SF genre highly interesting and useful, and concluded that they would gladly meet them as part of teaching topics of natural sciences (Figure 4). A number of students would like SF to be introduced as a separate subject (Figure 4). About half of the students found SF genre interesting (Figure 5).

***The need for further research***

Generally, in order to popularise and increase students' interest in natural sciences, it is necessary to engage and involve teachers and colleagues in a research at the international level on the importance of SF in the teaching of natural sciences, as well as social sciences, through

interviewing students, giving lectures on this and similar topics; publishing publications, developing teaching materials (handbooks, textbooks, didactic resources, school experiments, school television and TV educational programme) for natural sciences, which would be taught and learnt with the help of SF and similar contents in a research at the international level.

### Conclusions and implications for teacher education

It is possible to popularise natural sciences through science fiction, which is confirmed by the results of the survey on the opinion of students and lecture. Therefore, it is necessary to intensify introducing SF contents in science teaching in primary and secondary schools. This could be achieved through more intensive cooperation. Associations, schools and higher education institutions at an international level, founding the institute or department of the integrative teaching of SF in natural sciences as well as introducing SF as an optional subject at school. In any case, the Jubilee - 200 years of modern SF (1816; Mary Shelley-Frankenstein), which will be celebrated in 2016, also confirms the existence of historical ties and mutual influence between science and science fiction. Teaching natural sciences offers great potential for the implementation of SF contents, the interconnected source of ideas, and a place where the frontiers between science fiction and science disappear and where fantasy becomes science.

With the aim of popularising and increasing students' interest in natural sciences, there is certainly a need to engage and involve teachers and colleagues on an international level in order to carry out research on the importance of SF in the teaching of natural sciences. This does not merely represent a step forward into “unexplored” fields on the border between science and fantasy, but is rather a form of teacher training for new teaching challenges brought by the education of the 21<sup>st</sup> century: “Let's take a journey into the unknown, let's explore strange new worlds and boldly go where no [teacher] has gone before!” (Star Trek: The Original Series n.d.).

### Acknowledgements

First of all, I would like to thank the Association of Physics Teachers “Omega“ from Nis for the cooperation, and the invitation to the Camp of Physics 2014, and openness to the realisation of the lecture on the topic of SF. I would also like to thank the Association of Citizens Science Fiction “Sy&Fy“ from Belgrade for the help regarding the choice of SF literature, professional and helpful tips, as well as support.

### Endnotes

1. Grylls, G. R. 1938. “Mary Shelley. A Biography”. London: Oxford University Press. (Figure, n. pagination)
2. Source (Figure 1): [http://commons.wikimedia.org/wiki/File:Frankenstein\\_1818\\_edition\\_title\\_page.jpg](http://commons.wikimedia.org/wiki/File:Frankenstein_1818_edition_title_page.jpg).
3. Source (Figure 2): [http://upload.wikimedia.org/wikipedia/commons/e/e6/Frontispiece\\_to\\_Frankenstein\\_1831.jpg](http://upload.wikimedia.org/wikipedia/commons/e/e6/Frontispiece_to_Frankenstein_1831.jpg).
4. SOKO SPA (Serb. Soko Banja) is located in eastern Serbia, 55 km from Nis and 230 km from Belgrade. As a settlement it dates from VIII century BC. Today the best-known and most visited spa and health resort in Serbia with springs of radioactive and healing water.

### References

- Aelita Queen of Mars NTCS. 2012. *Youtube.com*. 15 September. <http://www.youtube.com/watch?v=je1bIhS-7G8>.
- Asimov, I. 1953. “Naturally occurring radioisotopes.” *Journal of Chemical Education* 30: 398.
- Asimov, I. 1953. “The natural occurrence of short-lived radioisotopes.” *Journal of Chemical Education* 30: 616-618.
- Asimov, I. 1954. “The relative contributions of various elements to the earth's radioactivity.” *Journal of Chemical Education* 31: 24-25.
- Asimov, I. 1954. “The elementary composition of the earth's crust.” *Journal of Chemical Education* 31: 70-72.
- Asimov, I. 1954. “Potentialities of protein isomerism.” *Journal of Chemical Education* 31: 125-

127.

- Asimov, I. 1955. "The radioactivity of the human body." *Journal of Chemical Education* 32: 84-85.
- Asimov, I. 1955. "The composition of the atmosphere." *Journal of Chemical Education* 32: 633-634.
- Asimov, I. 1956. "The elementary composition of the earth." *Journal of Chemical Education* 33: 67.
- Asimov, I. 1959. "Enzymes and metaphor." *Journal of Chemical Education* 36: 533-538.
- Asimov, I. 1968. "Try science fiction as a teaching aid." *The Physics Teacher* 6 (8): 416-433.
- Bojović, S. 2009. *Hemija u gimnazijama u Srbiji u XIX i XX veku*. Beograd: Hemijski fakultet u Beogradu.
- Brent Spiner On BBC Breakfast. 2010. *Youtube.com*. <http://www.youtube.com/watch?v=06u12FN2sUQ>.
- Czerneda, J. E. 2006. "Incorporating science fiction reading in the science classroom." *The Science Teacher* 73 (February): 38-42.
- Dubek, L. W., and R. Tatlow. 1998. "Using Star Trek: the next generation television episodes to teach science." *Journal of College Science* 27 (5): 319-323.
- Dubek, L. W., M. H. Bruce, J. S. Schmeckler, S. E. Moshier, and J. E. Boss. 1990. "Science fiction aids science teaching." *The Physics Teacher* 28: 316-318.
- Finch, S. 2000. "Dispatches from the trenches: science fiction in the classroom." *Extrapolation* 41 (1): 28-35.
- Frankenstein 1818 edition title page. *Wikipedia.com*. [http://commons.wikimedia.org/wiki/File:Frankenstein\\_1818\\_edition\\_title\\_page.jpg](http://commons.wikimedia.org/wiki/File:Frankenstein_1818_edition_title_page.jpg).
- Freundenrich, C. C. 2000. "Sci-fi science." *The Science Teacher* 67 (8): 42-45.
- Frontispiece to Frankenstein 1831. *Wikipedia.com*. [http://upload.wikimedia.org/wikipedia/commons/e/e6/Frontispiece\\_to\\_Frankenstein\\_1831.jpg](http://upload.wikimedia.org/wikipedia/commons/e/e6/Frontispiece_to_Frankenstein_1831.jpg).
- Grylls, G. R. 1938. *Mary Shelley, A biography*. London: Oxford University Press.
- Hector, Robert. n.d. *Light-Edition*. <http://www.light-edition.net>.
- Janson, T. 2009. "Top 15 greatest science fiction writers of all-time." *Mania.com*. [http://www.mania.com/top-15-greatest-science-fiction-writers-alltime\\_article\\_112611.html](http://www.mania.com/top-15-greatest-science-fiction-writers-alltime_article_112611.html).
- Jovanović, T. 2010. "Lukijan." *SF Almanah TERRA* 9: 20-40.
- Knjiga je da se čita. 2010. *Youtube.com*. <https://www.youtube.com/watch?v=VaIGi6y8ATU>.
- Memory Alpha Gene Roddenberry. n.d. *Memory-alpha.org*. [http://de.memory-alpha.org/wiki/Gene\\_Roddenberry](http://de.memory-alpha.org/wiki/Gene_Roddenberry).
- Nedeljković, A. B. 2010. "O noći 16. juna 1816 na Ženevskom jezeru." *SF Almanah TERRA* 9: 97-102.
- Pari, P. 1972. "Promene u nastavi hemije." *Hemijski pregled* 13 (3): 71.
- Pierce, E. 2001. "Science fiction and fantasy." *Voices from the Middle* 9 (2): 74-77.
- Raham, R. G. 2004. *Teaching science fact with science fiction*. Santa Barbara: Libraries Unlimited.
- Rohrbacher, C. 2013. "Evolving: using science fiction to engage students in evolutionary theory." *EvoS Journal: The Journal of the Evolutionary Studies Consortium* 5 (1): 51-60.
- Rutherford, S. 2006. "Movie Clip Lesson Plan-Indiana Jones and the Raiders of the Lost Ark." *MSTA JournalSpring 2006*: 40-42. [http://people.emich.edu/srutherford/index\\_files/MovieClipLessonPlan.pdf](http://people.emich.edu/srutherford/index_files/MovieClipLessonPlan.pdf).
- Schneider, T. 2007. "Science + Fiction: Isaac Asimov zum 15. Todestag." *Chem. Unserer Zeit* 41 (2): 80-85.
- Star Trek: The Original Series. n.d. *Tvtropes.org*. 25 June. <http://tvtropes.org/pmwiki/>

pmwiki.php/Series/StarTrekTheOriginalSeries.

Stojkovic, M. D. 2013. “Life sciences teaching in the former Yugoslavia as a TV phenomenon and in scientific-popular literature.” *Chemistry* 22 (4): 564-580.

Suerbaum, U., U. Broich und R. Borgmeier. 1981. *Science fiction: theorie und geschichte, themen und typen, form und weltbild*. Stuttgart: Reclam.

Vajgand, Dj. 1971. “Projekti nacionalne naučne fondacije SAD.” *Hemijski pregled* 12 (5-6): 201.

[Back to contents](#)



## Teachers’ professional learning and performance evaluation in different cycles

*Helena Fernandes<sup>1</sup> & Piedade Vaz-Rebello<sup>2</sup>*

*<sup>1</sup>Schools Network of Soure, <sup>2</sup>University of Coimbra, Portugal*

*mhgaf@hotmail.com & pvaz@mat.uc.pt*

### Abstract

This work aims to analyse the relationship between teachers’ professional learning and performance evaluation in different career cycles. To develop the empirical research, a qualitative study has been carried out, using semi-structured interviews with mathematics teachers of the third cycle of basic education and secondary education. The interviews focused on aspects such as perceptions about the purpose of teachers’ performance evaluation and its connection to teachers’ professional learning. A content analysis of the responses has been carried out, the data being interpreted taking into account socio-professional variables, namely, years of professional experience or positions held by teachers. The results obtained show that actual teacher performance evaluation practices are not understood as initiatives that promote professional development and that teacher’s career rank is associated with different experiences and perspectives of teacher performance evaluation.

**Keywords:** teachers’ performance evaluation; teachers’ professional learning; career cycles.

### Context of the research

In Portugal, systematic changes have recently occurred related to the teaching career, translated in the publication, in 2007, of the Teaching Career Statute and its successive redesigns, the most recent of which published at the Decree-Law n° 146/2013, 22 October.

In the scope of this process, a controversy around summative and formative approaches of teacher appraisal processes emerged and teachers from different career cycles experienced it in different ways.

### Research questions

The research addressed in this paper aimed to analyse the relationship between teachers’ professional learning and performance evaluation processes in different career stages.

### Theoretical framework

Teacher performance evaluation have been covering basically two dimensions: professional development and control, one being “process-oriented, and the other one being oriented for the product” (Day 2001, 150). The developmental/formative dimension of teacher appraisal process is thus an important element of the teacher assessment process (Day 2001, 166), although the control/summative side may be usually more visible for those who are involved, in particular teachers.

The implementation of the formative side of teacher appraisal has been considered a challenge (Flores, Rajala, Veiga Simão, Tornberg, Petrovic, and Jerkovic, 2009; Pacheco and Flores, 1999). In fact, the dynamic nature of teaching have called attention to the importance of teachers’ learning and professional development processes and to the multiple factors that may influence them. However, a research developed by Alves and Figueiredo (2011) involving ten Special Education teachers, concluded that teachers do not believe in the formative side of their evaluation, considering that it serves essentially purposes of control. Teacher appraisal “will not find appropriate ways to a sustained professional development but, rather, will address the economic dimension of how valuable we do” (Alves and Figueiredo, 2011, 123).

In Portugal, for decades, teacher appraisal system considered professional degree as the only

way to distinguish teachers. However legislation issued by the Ministry of Education Portuguese - Decree-Law 15/2007 of 19 January and Decree 2/2008 10 January - reflected clearly the imperative of changing this situation, focusing on teacher assessment as a basic design for career progression. With Decree-Law n° 146/2013, 22 October started the current performance evaluation model of teaching, more streamlined, less bureaucratic, aiming to contribute to a cultural revitalization of schools and greater professional responsibility. This evaluation model aims to encourage professional development of teachers, looking for the improvement of academic results and aiming to reduce early school leaver rates (Curado, 2002; Machado, Abelha, Barreira and Salgueiro, 2012). It is then relevant to know how the process is being developed and what teachers' perceptions about it are.

In order to develop a deeper comprehension of teachers' evaluation processes, it is also relevant to consider teacher career stage. Research has also shown the existence of several stages in the teaching career, which may be characterized by different concepts and professional practices (Day, 2001, 2007; Huberman, 2013). It is recognized that throughout their professional career teachers go through several pleasant or unpleasant situations and experience spontaneous or deliberate individual or joint experiences, according to what they are allowed to by the dominant cultural, social, economic and political contexts. Teachers' way of thinking, feeling and acting is influenced by several factors throughout their career, including personal and professional ones, relating to school contexts but also to educational policies (Day, 2001).

This research aims to contribute to the analysis of teachers' perceptions of the performance evaluation processes and of its relation with professional learning, considering different career stages.

## **Research methodology**

### ***Participants***

To develop the empirical research, a qualitative study has been carried out with mathematics teachers of the third cycle of basic education and secondary education, from the third, fourth, eighth and ninth ranks groups. The teacher career in Portugal has ten ranks, lasting four years each, except for the fifth rank. Each rank has a different pay index and additional specialized functions, as teacher evaluation, may be allocated to teachers in the higher ranks (Santiago, Donaldson, Looney and Nusche, 2012).

### ***Instrument***

The instrument used was a semi-structured interview. The interview guide focused on aspects such as perceptions about the purpose of teachers' performance evaluation and its connection to teachers' professional learning. A content analysis of the responses has been carried out, the data being interpreted taking into account socio-professional variables, namely, years of professional experience or positions held by teachers.

## **Findings**

The content analysis of the category “Teacher Performance Evaluation” identified five subcategories: Professional experience within Teacher Performance Evaluation, Weakness of Teacher Performance Evaluation, Feelings towards Teacher Performance Evaluation, Strengths of Teacher Performance Evaluation, Ideal Teacher Performance Evaluation. In each subcategory, indicators were also identified:

- Professional Experience within Teacher Performance Evaluation includes two indicators: Evaluator and Evaluated;
- Weakness of the Teacher Performance Evaluation is characterized through the indicators Lack of training from the evaluators, Artificial, Promoter of injustice, Evaluation between peers, Difficulty in establishing and following criteria;

- Feelings towards Teacher Performance Evaluation included the following indicators: Deception, Fear toward the evaluator, Insecurity;
- Strengths of Teacher Performance Evaluation considered the indicators: Formative, Allows new ideas in teaching practice, allows to be aware of the mistakes, Teacher becomes more aware of himself, Teacher Performance Evaluation framework;
- Ideal Teacher Performance Evaluation the indicators considered were: Honest and accurate, Tuned with the needs of the school, Existence of an external evaluator, Should grasp the simple reality without major formalisms, Familiarizing students with the process, Another type of lesson plan, Basic agreement for learning.

Subcategories, indicators and their frequencies are presented in Table 1.

Table 1- Teacher Performance Evaluation subcategories and indicators

Category	Subcategories	Indicators	Total	
Teacher Performance Evaluation	Professional Experience with Teacher Performance Evaluation	Evaluator Evaluated	0 2 (S2 S6)	6 (S1 S1 S3 S4 S4 S5) 0
	Weakness of the Teacher Performance Evaluation	Lack of training from the evaluators	0	6 (S1 S3 S3 S3 S4 S4 )
		Artificial	4 (S2 S2 S6 S6)	4(S3 S3 S3 S5) 3(S4 S4 S5)
		Evaluation between peers	1 (S6)	1( S4)
		Promoter of injustice Difficulty in establishing and following criteria	2 (S2 S6) 0	4 (S4 S4 S4 S4)
	Feelings towards Teacher Performance Evaluation	Deception	1 (S2)	2(S1 S4)
Fear of the evaluator Insecurity		0 1 (S6)	1 (S5) 0	
Strengths of Teacher Performance Evaluation	Formative	0	1 (S5)	
	Allows new ideas in teaching practice	0	2 (S5 S5)	
	Allows to be aware of the mistakes	0	1 (S5)	
	Teacher becomes more aware of himself Teacher Performance evaluation framework	0 0	1 (S5) 1 (S5)	
Ideal Teacher Performance Evaluation	Honest and accurate	0	1 (S5)	
	Tuned with the needs of the school	0	1 (S5)	
	Existence of an external evaluator	1 (S6)	0	
	Should grasp the simple reality without major formalisms	0	2 (S5 S5)	
	Familiarizing students with the process	0	1 (S5)	
	Another type of lesson plan Basic agreement for learning	3(S2 S2 S6) 0	1(S5) 3 (S5 S5 S5)	

Legend:

Blue - indicator verified only by teachers from the eighth and the ninth career ranks

Red - indicator verified only by teachers from the 3th and the fourth career ranks

Black - indicator verified by teachers from both groups

Green - indicator verified only by the S5 subject

The results were analysed taking into consideration participants' career ranks: participants of third and fourth career ranks, on one hand, and of eighth and 9 career ranks, on the other. The particular case of S5 was also considered due to its singularities. Results are presented in Table 1 using different colors to indicators of different career ranks: Blue to indicators verified only by teachers from eighth and 9 career ranks; Red to indicators verified only by teachers from 3th and fourth career ranks; Black to indicators verified by teachers from both groups and Green to indicator verified only by the S5 subject.

### *Professional experience within teacher performance evaluation*

Participants S1, S3, S4 and S5 were teacher evaluators while participants S2 e S6 were teachers that had been evaluated. Participants who were evaluated were precisely teachers from third and fourth



career ranks. Teachers from eighth and ninth career ranks were all teacher evaluators.

### ***Weakness of teacher performance evaluation***

Several weakness of teacher performance evaluation were identified. As can be analysed in Table 1, all the teachers interviewed considered various indicators that characterize teacher performance evaluation weakness: evaluators’ lack of specific training, artificial, peer evaluation based, injustice promoter, and difficulty in identifying evaluation criteria. The more frequent indicator was artificiality.

Lack of evaluators’ training and difficulties in identifying clear evaluation criteria were referred mainly by teachers from eighth and ninth career ranks. As all of them were evaluators, they identified specific weaknesses in the process. S4 reported having had difficulties in establishing and following evaluation criteria, “I did not want to evaluate teachers, but if I had to, the first thing I wanted to know were the evaluation parameters but I could not find them” (S4). He also said “I wanted to be rigorous and use criteria of justice. People seemed not to have the same criteria” (S4).

Among evaluators, only S5 did not mention the lack of evaluators’ training, perhaps because he has extensive experience as supervisor. S2 and S6, which were evaluated, considered that the teacher performance evaluation system is artificial and fostering injustice.

### ***Feelings towards teacher performance evaluation***

The most frequent feeling towards teacher performance evaluation was deception, referred by three of the six participants. S1 said “In reality it is not a “good practice” and S2 complained “You are being evaluated for a career and what is happening is that even if you really fulfill with your obligations there is no reward!” as well as S4 “Teacher evaluation done in this way is a big mistake, it does not assess anything”. S5 referred to the fear of the evaluator, “People were afraid of me as an evaluator”. S6, one of the participants that were evaluated, reported feelings of insecurity.

### ***Strengths of teacher performance evaluation***

Strengths of teacher performance evaluation were mentioned by S5 that considered several potentialities of the process. S5 considered that teacher performance evaluation has a formative dimension, “It is an important process of professional learning” (S5). The process brings new ideas to teaching practice, “new ideas I never thought about before” (S5). It also fosters awareness of the mistakes, “sometimes it is as if I saw myself in the mirror, I see in the others my own mistakes” (S5). This participant believes that teacher performance evaluation enables teachers to become more demanding with themselves, “I am a better teacher, more and more demanding with myself, of course” (S5). (S5). Finally, S5 referred to the principles of the teacher performance evaluation by stating “I think the basics principles are not bad” (S5).

These data point to the formative side of the teacher performance evaluation and to its role in teacher professional development. However, this is only referred by one of the participants, which shows that there is a lag between the ways teacher performance evaluation is being experienced by teachers and its potential.

### ***Ideal teacher performance evaluation***

Only S2, S5 and S6 gave some suggestions of what should be an ideal evaluation, and S5 was the one who made more suggestions. These teachers considered that teacher performance evaluation should be based in another type of lesson plan, “I agree that there must exist a plan but I do not agree with the one that is followed” (S2), “the analysis of the plan should not be so strict, if a pupil asks a question this may lead to a change in the initial lesson plan“(S6).

S6 considered that teacher performance evaluation should be done by external evaluators, “Maybe an outsider is fairer” (S6).

However most of the suggestions for an ideal teacher performance appraisal system was done by S5. According to this participant, the performance evaluation process should be honest and accurate, “provided it is honest and rigorous, I think it’s good” (S5). The ideal teacher performance evaluation should fit the needs of the school and the teacher, “the proper legislation must be in accordance with the school’s needs, never taking a teacher from his classroom, and should never force the teacher to do more only because it will be evaluated” (S5).

The evaluation should capture the simple reality without much formality, because “the evaluation process would be better if the evaluation process is natural” (S5), “(...) the evaluator could come and go when wanted” (S5).

The ideal teacher evaluation system should allow familiarizing students with the process, “the students should also become familiar with this process” (S5).

There also should be a basic agreement for learning and not inconsequent experiences with teachers and pupils. “We are as “guinea pigs”, learners are also as “guinea pigs” and I fear of this situation” (S5). “In these last five or six years there was some regularity in things, then alters everything in an incredible way, it is not clear why. Let's see if the results are better” (S5).

### Conclusions and implications for teacher education

The results obtained so far show that teacher performance evaluation practices are not understood as initiatives that promote professional development. Three participants in the present research pointed to strengths of teacher performance evaluation process, but only one of them explored its positive aspects and considered that teacher evaluation may have a formative side.

The weakest points of teacher performance evaluation practices are artificiality, peer evaluation and injustice. These issues are indicated by teachers of all professional ranks. They also referred that teacher performance evaluation implementation promote teachers’ deception and frustration and that it should be associated to another type of lesson plan.

The results obtained also show that teachers’ career ranks are associated with different experiences and perspectives of teacher performance evaluation. Teachers from eighth and ninth career ranks were all evaluators. In this condition, they identified weaknesses in the process, namely the lack of evaluators’ training and the lack of clear evaluation criteria. Teachers from third and fourth career ranks were in the process as evaluated, and in this scope they reported having felt insecurity. They considered that the ideal teacher performance evaluation should be carried out by an external evaluator.

It is then important to diversify professional development strategies according to different career stages, and to develop methods for assessing performance that take into consideration a strong formative component and that are effective for the professional development of teachers.

### References

- Alves, M., and L. Figueiredo. 2011. A avaliação de desempenho docente, quanto vale o que fazemos. *Educação, Sociedade e Cultura*, 33: 123-140.
- Curado, A. 2002. *Política de avaliação de professores em Portugal: um estudo de implementação*. Lisbon: Fundação Calouste Gulbenkian.
- Day, C. 2001. *Desenvolvimento profissional de professores; os desafios da aprendizagem permanente*. OPorto: Porto Editora.
- Day, C. 2007. “A reforma da escola: Profissionalismo e identidade dos professores.” In *Profissionalismo docente em transição: As identidades dos professores em tempos de mudança*, edited by M. Flores and I.Viana. orgs., 109-129. Braga: University of Minho (CIED).
- Flores, M., A. R. Rajala; A. Simão; A. Tornberg; V. Petrovic, and I. Jerkovic, 2009. “Learning at work. Potential and limits for professional development.” In *Making a difference: Challenges for teachers, teaching, and teacher education*, edited by J. Butcher and L. McDonald. eds., 141-156. Rotterdam: Sense Publishers.

Huberman, M. 2013. “O ciclo de vida profissional dos professores.” In *Vidas de professores*, edited by A. Nóvoa. org., 31 – 61. OPorto: Porto Editora.

Machado, E., M. Abelha; C.Barreira; and A. Salgueiro, 2012. “Avaliação pelos pares: Percurso normativo da Avaliação do Desempenho Docente em Portugal.” *Revista Portuguesa de Pedagogia* 46 (I): 73-93.

Pacheco, J., and M. Flores. 1999. *Formação e avaliação de professores*. OPorto: Porto Editora

Santiago, P.; G. Donaldson; A. Looney; and D. Nusche 2012. *OECD Reviews of Evaluation and Assessment in Education: Portugal 2012*. OECD Publishing. <http://dx.doi.org/10.1787/9789264117020-en>

[Back to contents](#)

## **The role of monitoring classroom practice in the aim of educational service provision: analysis of results on 1<sup>st</sup> cycle of the external evaluation of schools**

*Margarida Amaral<sup>1</sup>, Graça Bidarra<sup>2</sup> & Piedade Vaz-Rebelo<sup>2</sup>*

*<sup>1</sup>Schools Network of Sei, <sup>2</sup>University of Coimbra, Portugal*

mmafricano@gmail.com, gbidarra@fpce.uc.pt & pvaz@mat.uc.pt

### **Abstract**

The current study aims to analyse the contribution of pedagogical supervision for the effectiveness of schools in order to find out the schools performance in the Educational Service Provision dimension of the framework concerning the first cycle of the External Evaluation of Schools in Portugal (2006-2011); more precisely in the factor Monitoring Classroom Practices and their relationship with the Results. The developed methodology involves an empirical documental study, using the analysis of the reports of the external evaluation of schools, for the first evaluation cycle, in order to analyse the relationship between the classification obtained in the field of Educational Service Provision and the obtained in the factor Monitoring Classroom Practices and between this and the Academic Results. According to the results obtained, there is a relation between the ratings obtained in the field of Educational Service Provision, those obtained in the factor Monitoring Classroom Practices and the ones in the field of the Results. These data draw attention to the central role that Educational Service Provision can assume in explanation of pupils results and also justify the interest around the strategies for Monitoring Classroom Practices.

**Keywords:** schools quality; pedagogical supervision; effectiveness of schools.

### **Context of the research**

When there are recognized but separated scientific approaches inherent in the effectiveness of schools and the effectiveness of teaching, we find important to describe and to analyse the forms of articulation between them, pointing to a joint approach in perspective. In this scope it is relevant to know what, in fact, goes on in schools, particularly, at the level of supervision practices developed and how these are connected with the students' performance and school quality. Are supervision practices promoted or not, in special in what respects to classroom activities? How are they prosecuted? What impact do they have? These are some of the questions to which we look for answer, considering the framework and results obtained in the first cycle of the External Evaluation of Schools in Portugal.

### **Research aim**

The current study aims to analyse the contribution of pedagogical supervision for the effectiveness of schools in order to find out the schools performance in Educational Service Provision, more precisely in the factor Monitoring Classroom Practices and their relationship with the Results, according to the adopted framework of the first cycle of the External Evaluation of Schools in Portugal. It also aims to identify the advantages of the pedagogical supervision in a regulation perspective and associated to the functions of the coordinators of curricular departments and/or of the pedagogic group's coordinators.

### **Theoretical framework**

In the scope of research on schools and their quality, classroom activities have been assuming a central role in the explanation of pupils' academic results (Lima 2008; Scheerens 2004), justifying the interest around the theoretical models and the strategies to monitor these practices. These models have been developed both at international level (Duffy 1998; Glickman, Gordon and Ross-Gordon 2013) and at national level, with the work performed on pedagogical supervision (Alarcão and Tavares 2007; Formosinho 2002; Vieira and Moreira 2011).

In turn, studies on the teaching effectiveness have focused on the teacher’s figure. Despite the key variable referring to product has been enlarged, taking in consideration indicators such as attitudes or social outcomes, academic results are still central for the consideration of the effectiveness of teaching. This centrality of the results and consequently of the teaching practices promoting them implies also the centrality of pedagogical supervision. It also justifies the importance to characterize the dimensions of pedagogical supervision which supply a direction of teaching practice to the teacher through a continuous monitoring (Alarcão 1999; Simões, Nascimento and Vaz-Rebelo 2012; Vieira 2006).

At a national level, the reports of the National Board of Education (2002; 2005; 2008) on the External Evaluation of Schools also state that the factors considered most relevant to the improvement of school organizations focus on the processes that occur in the classroom, thus highlighting the importance of the teacher’s role and the pedagogical supervision as a unifying action and generating fundamental practices in order to improve the effectiveness of teaching and schools. However, a data analysis concerning the first cycle of the External Evaluation of Schools process (2006-2011) shows that the factor Monitoring Classroom Practices presents the lowest outcomes in the field of Educational Service Provision, drawing attention to the interest in analysing the characteristics and impact of such practices and their connection with the results and effectiveness of schools (Barreira, Bidarra, and Vaz-Rebelo 2011).

### **Research methodology**

The developed methodology involved an empirical documental study, using the analysis of the reports of the external evaluation of schools for the first evaluation cycle (2006-2011). The school years 2007/08, 2008/09 and 2009/10 were analysed in the current study, totalizing the amount of 167 schools.

First, it was determined the frequency of the obtained classifications in factor Monitoring Classroom Practices, per school year. Following, and in order to analyse the relationship between the classification obtained in the domain of Educational Service Provision and the obtained in the factor Monitoring Classroom Practices and between these and the Academic Results, the correlations between the field of Educational Service Provision and the factor Monitoring Classroom Practices and between these and the Academic Results were determined.

Finally, it was developed a content analysis of the school evaluation reports of schools for the first evaluation cycle (2006-2011) that were distinguished in the classification of the factor Monitoring Classroom Practices, with the purpose of both knowing the conceptions and practices of pedagogical supervision, to understand the relationship between these practices and the effectiveness of education and schools. In this scope, we analysed 6 reports of the External Evaluation of Schools, from the Centre of Portugal, carried out by the General Inspectorate of Education and Science (IGEC).

### **Findings**

The frequency of the classifications in factor Monitoring Classroom Practices, per school year is described in Table 1. We check that in the years in regard, the classification of (insufficient) INS was not attributed.

The classification of B (good) was the only one that suffered a continuous increase in its attribution, along the years. Nevertheless, it is the classification of SUF (sufficient) that presents a higher percentage in the set of these three school years. Such situation can translate a demanding evaluation of the factor or, on the other side, an evaluation of difficult objectivity for lack of concrete data, having with base only the few but enough evidences presented for the schools.

The frequency of classifications in factor Monitoring Classroom Practice along those schools years can also be visualized in Figure 1.

Table 1. Classification of schools in factor Monitoring Classroom Practices

Classif.	School Year							
	2007/08		2008/09		2009/10		Total	
	f	%	f	%	f	%	f	%
MB	0	0	1	2	5	8	6	4
B	10	21	24	42	36	57	70	42
SUF	37	79	32	56	22	35	91	54
INS	0	0	0	0	0	0	0	0
Total	47	100	57	100	63	100	167	100

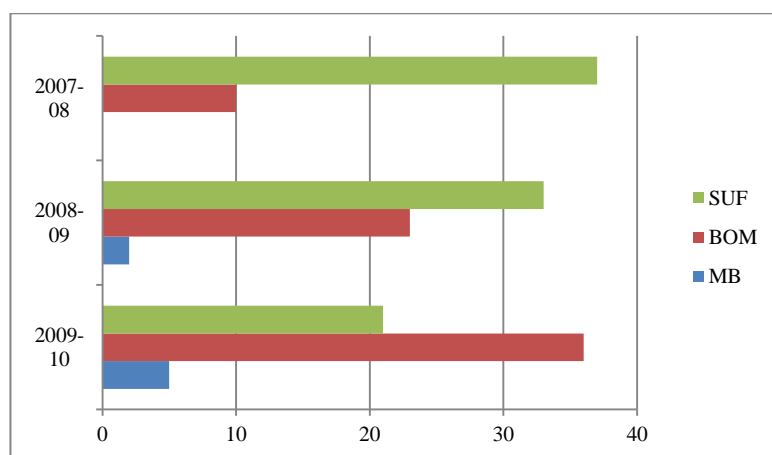


Figure 1. Frequency of classifications in factor “Monitoring Classroom Practice”

The analysis of this graph stops beyond corroborating what we cited before, it calls to the attention for almost an inverse variation between the classifications of SUF (sufficient) and BOM (good) throughout the three pertaining school years in study. Continuing our study we looked for to proceed to analyse the relationship between the classification obtained in the domain of Educational Service Provision and the one obtained in the factor Monitoring Classroom Practices and between these and the Results. Table 2 presents the correlations between the field of “Educational Service Provision” and the factor “Monitoring Classroom Practices” and between these and the “Results”.

Table 2. Correlations

Correlation	Pearson’s correlation coef.
D2 / F2.2	0.634 *
D1 / D2	0.664 *
D1 / F2.2	0,526 *

(\*Correlation is significant at the 0.01 level (2-tailed)) D1 - Domain of “Result”; D2 - Domain of “Educational Service Provisio”; F2.2 - Factor “Monitoring Classroom Practices”

We determined the Pearson’s correlation coefficient. The values that we found means that there is a strong relation, in other words, when the value is near of 1, the stronger it is the linear association between the two variables in relation. It seems that this one is stronger between the Domain of Results and the Domain of Educational Service Provision and also between the Domain of Educational Service Provision and the Factor Monitoring Classroom Practices.

For better understanding of what goes on, we chose only some schools for study. The schools taken for study were those which obtained the best results (MB, very good) in the factor Monitoring Classroom Practices. We analyse 6 schools’ reports of the External Evaluation of Schools.

The factor Monitoring Classroom Practices, in the domain Educational Service Provision,

was taken as the corpus and the categories were presented in Table 3, according to the adopted framework for the External Evaluation of Schools: Planning, Classroom Practices and Evaluation.

Table 3. Categories, subcategories and indicators of the factor Monitoring Classroom Practice

Category	Subcategory	Indicator
Planning	Relation between the classroom activity planning and general documents guidelines	<ul style="list-style-type: none"> <li>- Coherence of classroom activity planning with the Educational Project guidelines</li> <li>- Coherence of classroom activity planning with the Curricular Project guidelines</li> <li>- Coherence of classroom activity planning with the Annual Activities Plan guidelines</li> </ul>
	Relation between the classroom activity planning and department intermediate structures guidelines	<ul style="list-style-type: none"> <li>- Coherence of classroom activity planning with the Curricular Department and Class Council guidelines</li> <li>- Coherence of classroom activity planning with the results of the diagnostic evaluation</li> </ul>
Classroom Practice	Indirect mechanisms of monitoring classroom practices	<ul style="list-style-type: none"> <li>- Verifying documents of individual planning</li> <li>- Balance of the syllabus accomplishment</li> <li>- Identifying failure situations</li> <li>- Identifying the effectiveness of supporting measures</li> </ul>
	Intervenients in indirect monitoring	<ul style="list-style-type: none"> <li>- Structures of educative coordination and pedagogic supervision</li> </ul>
	Actions for teachers' monitoring to overcome probable difficulties	<ul style="list-style-type: none"> <li>- Formative dialogue with the department coordinator</li> <li>- Classroom observation by the coordinator and/or by a nominated teacher</li> <li>- Co-teaching</li> </ul>
Evaluation	Procedures to promote trust/reliability in the internal evaluation	<ul style="list-style-type: none"> <li>- Definition and application of common evaluation criteria per year/cycle</li> <li>- Adopting common evaluation and register tools</li> <li>- Standardization of criteria carried out by the Class Council</li> <li>- Periodical analysis of results carried out by the structures of coordination and supervision</li> <li>- Intermediate evaluation of the Subject Area/Class Curricular Projects</li> </ul>
	Monitoring learning through means external to the school	<ul style="list-style-type: none"> <li>- Using the questions of national exams</li> <li>- Intermediate test from GAE</li> </ul>
	Redefining strategies	<ul style="list-style-type: none"> <li>- Planning and implementing improvement measures</li> </ul>

Results from the content analysis of the factor Monitoring Classroom Practices of the 6 reports of the External Evaluation of Schools from the Centre of Portugal, carried out by the General Inspectorate of Education and Science (IGEC) are presented in Table 3.

What are then the good practices of supervision identified in the schools that became detached on the classification in the factor Monitoring Classroom Practices?

In the category Planning, there were considered the subcategories connected with functional aspects that were valued, in the evaluation of the factor, and based on the relation between the classroom practices, general documents and department intermediate structures guidelines. Such valuation was established at the level of the coherence between what is really done and what is expected to do.

We can see in the category Classroom Practice that the subcategories are connected with procedural aspects that wrap actions of indirect monitoring, like pedagogical supervision. In this extent are valued processes of checking and identification of situations and measures in the search of effectiveness, the participation of the Structures of educative coordination and pedagogical supervision, classroom observation and co-teaching, always in a perspective of formative dialog between peers.

Concerning the category Evaluation, the subcategories, considered also related to procedural

aspects but, in the perspective of the checking and evaluation of its application they allow, in accordance with the respected indicators re-define strategies and to plan improvements in the search of the effectiveness and to quality improvement of the service provided.

Thereby, promoting good supervision practices based on the fulfilled analysis consist in monitoring functional and procedural aspects of the classroom activities; in a proactive dialog between teachers and supervisors, in a formation perspective between peers and in the identification of aspects to be improved proceeding to the strategies redefinition by the work group.

The number of registration units per category is presented in Figure 2.

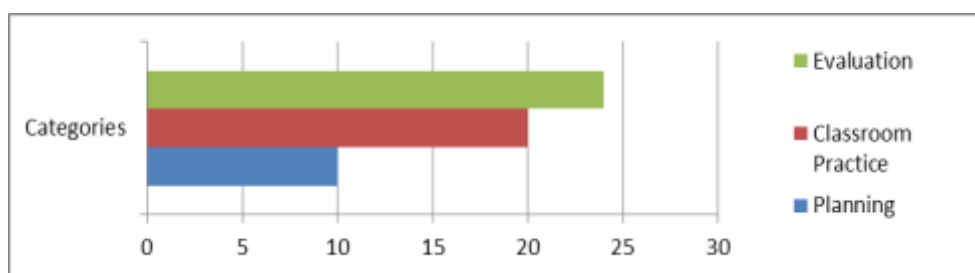


Figure 2. Number of registration units per category

In the studied schools, the planning it is the one with less importance in what respects to the factor in study. The reading of the results of the content analysis remembers that the planning process is the first one to have in account at the beginning of each school year but, in accordance with seems that it is not most excellent, but certainly the most easy to verify. On the other hand the evaluation takes the paper most important, being, however, the least objective category. From the reading of the results seems that Classroom Practice, also it is taken in high consideration.

### Conclusions and implications for teacher education

The analysis on the reports of the External Evaluation of Schools, from the Centre of Portugal, concerning the first evaluation cycle, reveals that the classifications obtained in the factor Monitoring Classroom Practices remain mostly at the Satisfactory level (SUF). There are also correlations between these classifications and those obtained in the domains Results and Educational Service Provision, being higher with the latest one as it is the domain in which it is included. In 167 schools analysed, only 6 present classifications of Very Good (MB) in Factor Monitoring Classroom Practices, which led us to the content analysis on the reports of these schools that make the difference as future study cases in order to map these practices.

The content analysis concerning factor Monitoring Classroom Practices lets us notice that these schools develop indirect ways of pedagogical supervision which lie predominantly at the level of evaluation, extending to the classroom practice and to planning. According to the results obtained so far, there is a relation between the ratings obtained in the field of Educational Service Provision; those obtained in the factor Monitoring Classroom Practices and the ones in the field of the Results. These data draw attention to the central role that Educational Service Provision can assume in explanation of students results and also justify the interest around the strategies for Monitoring Classroom Practice.

### References

- Alarcão, I. 1999. “Um olhar reflexivo sobre a supervisão.” In *Actas do I Congresso Nacional de Supervisão*, 256-266. Aveiro: University Aveiro
- Alarcão, I. 2009. “Formação e supervisão de professores: uma nova abrangência.” *Sísifo Revista de Ciência da Educação*, nº 8.
- Alarcão, I. and J. Tavares. *Supervisão da prática pedagógica: uma perspectiva de desenvolvimento*



*e aprendizagem*. Lisbon: Livraria Almedina.

Barreira, C., M. Bidarra, and P. Vaz-Rebello 2011. “Avaliação externa de escolas: do quadro de referência aos resultados e tendências de um processo em curso.” *Revista Portuguesa de Pedagogia* Extra-Série: 81 - 94.

Duffy, F. 1998. “The ideology of supervision.” In *Handbook of research on school supervision*, edited by G. Firth and E. Pajak, 181-199. New York: Macmillan.

Formosinho, J. 2002. *A supervisão na formação de professores II: da organização à pessoa*. OPorto: Porto Editora.

Glickman, C., S. Gordon, and J. Ross-Gordon. 2013. *Supervision and instructional Leadership: A developmental approach*. Boston: Pearson Education (US).

Inspeção Geral da Educação 2006-2011. *Avaliação externa das escolas: avaliar para a melhoria e confiança*. Ministério da Educação - IGE.

Lima, J. 2008. *Em busca da boa escola: Instituições eficazes e sucesso educativo*. Vila Nova de Gaia: Fundação Manuel Leão.

Scheerens, J. 2004. *Melhorar a eficácia das escolas*. OPorto: edições ASA.

Simões, H., M. Nascimento, and P. Vaz-Rebello. 2012. “Teachers’ supervision in Portugal: Concepts and practices.” In *Book of abstracts. IV ATEE Winter Conference. Professional development of teacher educators: Bringing together policy, practice and research*, edited by A. Swennen et al., 119. University of Coimbra.

Vieira, F., and M. Moreira. 2011. *Supervisão e avaliação do desempenho docente: para uma abordagem de orientação transformadora*. Lisbon: Ministério da Educação.

[Back to contents](#)

## **Educational support in the light of school external assessment**

*Raquel Batista de Oliveira<sup>1</sup>, Graça Bidarra<sup>2</sup> & Piedade Vaz-Rebelo<sup>2</sup>*

*<sup>1</sup>CAPES, Brazil; <sup>2</sup>University of Coimbra, Portugal*

raqueljpa@hotmail.com, gbidarra@netcabo.pt & pvaz@mat.uc.pt

### **Abstract**

This article deals with the inclusion of special needs education (SNE) students in regular groups in the public educational system in Portugal. The objective of such article is to describe the differentiation practices and educational support through the perspective of the institutional school assessment carried out by the Inspeção Geral de Educação e Ciência (IGEC). Aiming at mapping the differentiation practices and support, pointing to its placement in the ranking of strengths or improvement areas, 42 External School Evaluation (ESE) reports were submitted to content analysis. The reports were obtained from data related to the central region of continental Portugal, from the second assessment cycle, which started in 2011-2012. The results from this research show that the differentiation and support practices happen more frequently in the analysis field “Teaching Practices”, comparatively to its reference on the analysis field “Planning and Coordination, and monitoring and evaluation of teaching and learning”.

**Keywords:** inclusion; external school evaluation; pedagogical differentiation; educational support.

### **Context of the research**

The present research is included in the broad umbrella of inclusive education, and is has as reference the inclusive education legislative track of special needs education students in Portuguese public schools. Effectively, it is related to a positively assessed factor in the first cycle of the External School Evaluation (Barreira, Bidarra and Vaz-Rebelo 2011; Inspeção Geral de Educação 2006-2011), which must be better understood, targeting the mapping of differentiation and support practices, its ranking in terms of strengths and improvement areas in schools in the second evaluation cycle.

### **Research aim**

The research aims to describe the differentiation practices and educational support through the perspective of the institutional school assessment carried out by the Inspeção Geral de Educação e Ciência (IGEC).

### **Theoretical framework**

In Portugal, in 1986, the Educational System law was published, (Portugal Ministry of Education, 1986), ensuring the integration of Special Needs Education (SNE) children, in addition to characterizing “special need education as a special modality of school education, aiming at the recovering and the social-educational integration of individuals with specific needs related to physical and mental disabilities” (Rebocho, Candeias and Saragoça 2009, 40). After this law, the decree-law 35/90, on January 25<sup>th</sup>, issued the gratuitousness of access to basic education to all students. It consolidated thus the obligation of disabled students to attend school, towards obtaining the minimal conditions to progress in education, in social interactions, and in professional activities. However, both the educational system law and the decree were more concerned with the conception of integration as an idea than with the actual inclusion of SNE students.

The issue of the decree-law 319/91 boosted the educational responses towards the inclusion of disabled students. This decree “fulfils a gap that has been long felt, in the realm of Special Education, updating, broadening and making precise its field of action” (Correia 1999, 29). From this point on educational measures that valued differentiation were taken.

On January 26th 1990, the Portuguese government takes initiative when signing the Convention on the Rights of Children, and the World Declaration on Education for All in March 1990, in Joimtiem, Thailand. In 1994 there is the Salamanca Declaration that issues for “School for All” or “Inclusive School”, advocating for the right of every child or youth with SNE to have access to regular schooling, as well as advocating for the necessary conditions to such access, more precisely, for schools and teachers to be prepared to help the needs of all students.

From this moment on there is a broadening of the legislative tracks that legitimized educational responses that needed to be adopted by the educational system, namely the school education, so as it could adequately fulfil the needs of all the students. Thinking along these lines there is the decree-law 3/2008, published in January 7<sup>th</sup>, proposing the framing of measures, principles, values, and necessary instruments to guarantee the quality of education for all students in a teaching/learning process. Facing such affirmation, it is understood that one of the assumptions of inclusion is the assurance of quality education that caters for a diverse universe of students, so it can provide adequate educational measures that effectively work for such universe. In Portugal, there is a National Program of External Evaluation of Schools, promoted by IGEC, with the purpose to investigate the quality of education in institutions before higher education.

This evaluation has been developed in public schools in Portugal since 2006, and it is being carried out in the school clusters in the North region, Central region, Lisbon, Vale do Tejo, Alentejo, and Algarve. IGEC is responsible for general guidance for self-assessment and external assessment of schools/clusters of public schools, as issued in the Law 31/2002, published on December 20<sup>th</sup>, as well as the decree-law 75/2008, on April 22<sup>nd</sup>.

The results of each evaluation produce reports that are published in IGEC’s webpage (<http://www.ige.min-edu.pt/>), which are guided by accountability and transparency principles, informing the community about the performance and quality of education in schools.

The data from ESE, relative to the first assessment cycle, reveals that the differentiation factor and the support factor obtained the classifications very good and good in a larger percentage, being equally present among the strengths, and more frequently than the school weaknesses (Inspeção Geral de Educação 2006-2011). However, during the second cycle this factor is no longer present and is occurs under the field analysis referent “teaching practices, monitoring and evaluation of teaching and learning”. Even so, in this evaluation cycle, only the category “educational service provision” was attributed, and the analysis fields previously mentioned and relative referents were not objects of classification. In this perspective, we tried to apprehend such practices of differentiation and support through ESE, though the content of these reports, even if they did not have as an objective dealing with such practices, since they are the other intervention, this one aiming at special education (Inspeção Geral de Educação 2011-2012).

### **Research methodology**

For this documental study 42 ESE reports were used, they belonged to the second evaluation cycle (2011-2012), as mentioned before, referring to public schools in the Central region of continental Portugal. We used content analysis as a method, which allowed us to systematically unveil the content present in the messages. Amado (2009) claims that “the concept of content analysis has gone through developments over time” which firstly focused on “the description of declared contents” and later on the “function or process of inference, seeking for a signification that is beyond the immediately comprehensive and awaits for its unveiling” (236). The description and interpretation of data goes through the inference, which is “the intermediary process that allows for passage, explicit and controlled” (Bardin 1977, 39).

The content analysis of the reports has a quantitative character, aiming at uniting the frequency with which the register units and the indexes figure when facing the general aspects of the organizational structure of the school or school clusters and the specific aspects and practices of differentiation and support. To perform such analysis we selected as “corpus” the denomination “Educational Service Provision”, as categories the analysis fields, and as subcategories the referents of the aforementioned denomination, according to the adopted framework. The content

related to the “strengths” and “improvement areas” of differentiation practices and support. The analytical categories are expressed below: A- Planning and Coordination; B- Teaching Practices; C- Monitoring and Evaluation of Teaching and Learning; D- Strengths; E- Improvement Areas. From these categories the following conceptual matrix was built, also composed by the subcategories (as aforementioned) and the indexes.

Table 1. Conceptual matrix for content analysis

Category	Sub-category
A-Planning and articulation	A1-Articulated management of the curriculum
	A2-Contextualization of the curriculum and openness to the social environment
	A3-Classroom curricular projects
	A4-Contextualization of the academic project (EP)
	A5-Use of information on students’ educational journeys
	A6-Coherence between teaching and evaluation
	A7-Cooperative work among teachers
B-Teaching practices	B1-Adequacy of teaching and educational activities to children and pupils’ abilities and learning pace
	B2-Adequacy of educational responses to children and pupils with special educational needs
	B3-Active and experimental methodologies in teaching and learning
	B4- Maximization of educational resources and learning time
	B5-Monitoring and supervising teaching practice
C-Monitoring and evaluation of teaching and learning	C1-Diversity of assessment types
	C2-Gauging instruments and criteria of assessment
	C3-Evaluation of individual programs
	C4-Internal monitoring of the curriculum development
	C5-Efficiency of actions that aim to promote success at school
	C6-Prevention of non-completion and early school leaving
D-Strengths of differentiation and support practices	D1-Diversification of forms of evaluation
	D2-Adequacy of support to children and pupils with special educational needs
	D3-Prevention of non-completion and early school leaving
E-Areas that need improvement in support and differentiation practices	E1-Efficiency of educational support actions
	E2-Adequacy of support to children and pupils with special educational needs

## Findings

The results show that the more specific aspects of differentiation and support practices are more present on the analysis category B- “Teaching practices”, in comparison to the analysis category C- “Monitoring and Evaluation of Teaching and Learning” and A - “Planning and Coordination”. This is justifiable due to the fact that in the B category - “Teaching Practices” the subcategories B1- adequateness of educational and teaching activities to the capacities and learning paces of children and students and B2 - adequateness of educational responses to children and SNE students.

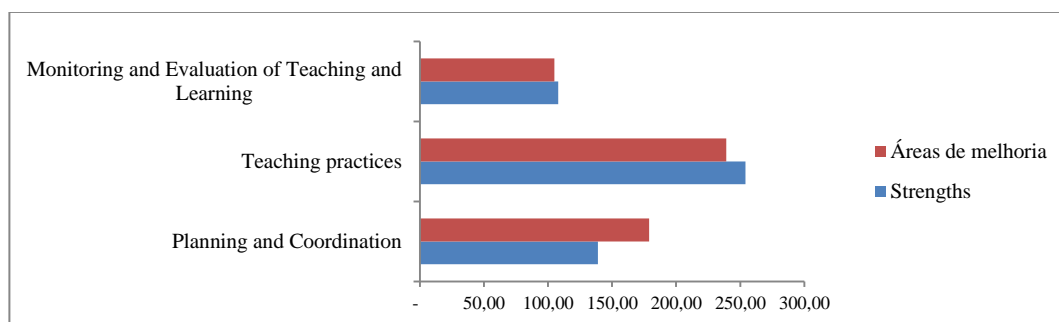


Figure 1. Frequency of indicators of differentiation practices and support in the educational service provision (Inspeção Geral da Educação e Ciência, 2011- 2012)

About A - “Planning and Coordination”, it reveals that there is a lower frequency of specific aspects of differentiation and support practices, which supports the data in IGEC reports, data related to the Measures of Special Education, in which the aspect “school structural documents with strategies to the development of Special Education” figures as an improvement area. In this sense, we believe that it is necessary for the schools to invest in this area, asserting that the inclusion of SNE students’ needs to be integrated in the whole school organizational structure, in its planning, evaluation, coordination, in cooperative work among educational agents and practices developed in the classroom.

It was also noticeable in B - “Teaching practices”, the reference to the diversity of support measures and organizational structures, highlighting “Programa Educativo Individual” (Individual Educational Program - IEP), “Currículo Específico Individual” (Individual Specific Curriculum - ISC), and “Unidades de Ensino Estruturado” (Structured Teaching Units - STU). In this category there is a subcategory which is specific to the differentiation and support practices, namely B2 - adequateness of educational responses to children and SNE students, which justifies the higher frequency of differentiation and support practices, this subcategory being the most frequently referred in D - “Strengths” in differentiation and support practices. However while there is still a higher frequency of differentiation and support practices in this category, the data suggest that the indexes need a quantification in register units, mainly when it comes to educational measures of special education (IEP, ISC, STU) and to the organizational structures of the special education modalities aforementioned.

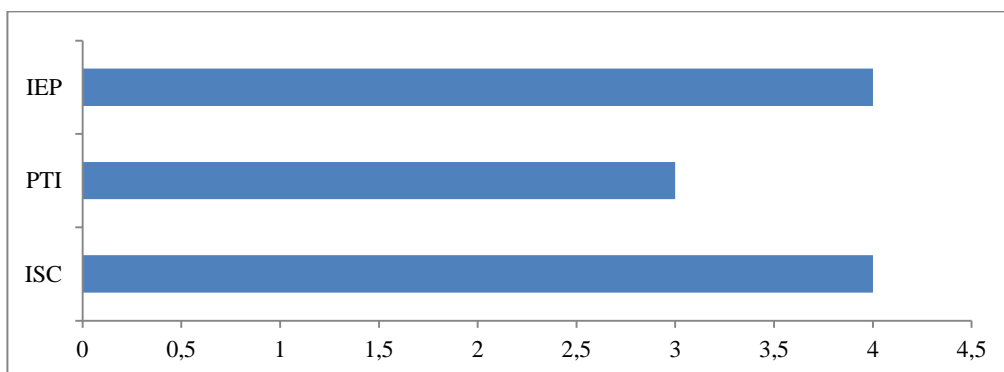


Figure 2. Educational measures of special education

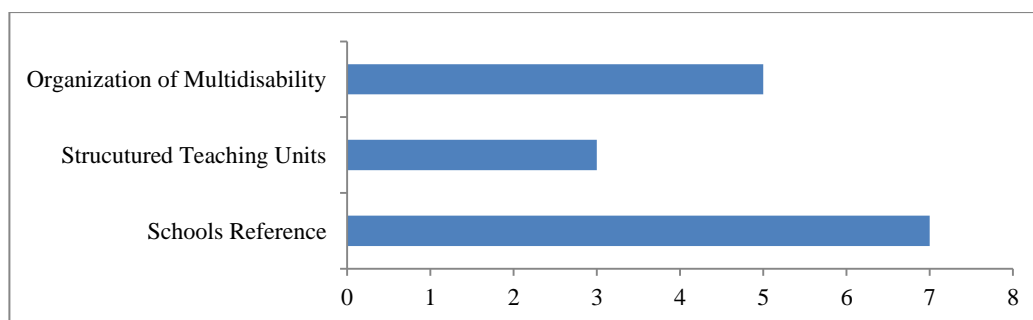


Figure 3. Organizational structures of special education

Category C - “Monitoring and Evaluation of Teaching and Learning” also registers a lower frequency of specific aspects related to the differentiation and support practices, pointing to the need of more investment of schools and school clusters. Such data converges with the reports made by the IGEC inspection in the modality of Special Education where “Monitoring and evaluation of Main Special Education Strategies” can be found as an aspect to be improved.

In categories C - “Monitoring and Evaluation of Teaching and Learning” and A - “Planning and Coordination” there is a lower frequency of indexes of differentiation and support practices,

justified by the fact that the subcategories are more frequently related to the organizational structure of the school and the school cluster. About this, we consider that schools and school clusters need to invest more in school structuring documents, making explicit “[...] the organizational and functional adaptations necessary to the development of the educational responses related to special education, as well as the objectives and strategies that the school proposes to achieve and adopt, with the intent to support permanent type special needs education students and the specific differential educational responses” (Inspeção Geral de Educação 2011-2012, 49).

The support measures more often referred are the Individual Educational Program, the Individual Specific Curriculum and, and less frequently the Transition Individual Program. We consider that there is a preoccupation from ESE in referring such educational measures, which are relevant to the development of differentiation and support practices as well as the development of the SNE students. Therefore, obeying the decree-law 3/2008, published on January 7<sup>th</sup>, where such deliberations are mentioned. About this, Correia (2007) claims that “the inclusion must not be a mere inclusion of all SNE students in regular classroom without a guaranteed set of principles (legislation, resources, collaboration, etc)” (13).

In regards to the organizational structures of special education, there was a higher frequency in Structured Teaching Units in relation to the Multi-disability Unit and Referential Schools. These organizational structures were specified in D - “Strengths” in differentiation and support practices. However, the index that refers to this aspect needs to be quantified by the register units, and that allows us to claim for an investment in such area by some of the schools and the school clusters, fulfilling what is described in the decree-law 3/2008, published on January 7<sup>th</sup>.

In relation to the indexes of differentiation and support practices in the strengths and improvement areas of the school, there is a higher frequency of the former, yet the low quantification in register units in the ESE report analysis suggests the need of a higher investment in this area by the school clusters.

### **Conclusions and implications for teacher education**

The discourse analysis of the school institutional evaluation about the differentiation and support practices revealed a higher number of references to these practices in the analysis field “Teaching Practices”, comparatively to its references in “Planning and Coordination and Monitoring and evaluation of teaching and learning”. This way, the data obtained in this study shows us that the schools developed inclusion practices, even if they need to improve, in the sense of better planning and assessment of such practices, assuming a more visible character in the structuring documents in the schools. The results show that there is attention to such practices in the ESE frame, in addition to the IGEC reports in the special education modality. However, it is still left to be known the opinion and attitude of teachers and other elements in the educational communities, intertwining different views on the same practices, which will help in the development of teacher training projects. This seems to be a relevant aspect to inclusive education, once the “Teaching and Learning International Survey” (TALIS 2009-2010) claims that in Portugal one of the needs that regular school teachers feel is related to training in dealing with the heterogeneity present in the classrooms, particularly with SNE students. In the same perspective, the Salamanca Declaration claims that teacher training must “[...] promote an attitude towards disability and develop understanding about what can be done in schools with the available local resources” (UNESCO 1994, 27). Vasconcelos (2012, 31) claims that teacher training takes a major role in the efficaciousness of the responses related to the transformations in schools. Thus, it is mandatory to think, to discuss, and to develop research about teacher training for the inclusion of special needs education students.

### **References**

Amado, J. 2009. *Introdução à investigação qualitativa em educação*. (Relatório de Provas de

Agregação). Coimbra: University of Coimbra.

Bardin, L. 1991. *Análise de conteúdo*. (L. A. Reto., A. Pinheiro, Trad.). Lisbon: Edições 70, Lda. (Original book published in 1977).

Barreira, C., M. Bidarra, and M. Vaz-Rebello. 2011. “Avaliação externa de escolas: do quadro de referência aos resultados e tendências de um processo em curso.” *Revista Portuguesa de Pedagogia*, Extra-Série: 81 - 94.

Correia, L. 1999. *Alunos com necessidades educativas especiais nas classes regulares*. OPorto: Porto Editora.

Correia, L. 2010. *Educação especial e inclusão - quem disser que uma sobrevive sem a outra não está no seu perfeito juízo*. OPorto: Porto Editora.

Inspeção Geral da Educação 2006-2011. *Avaliação externa das escolas: avaliar para a melhoria e confiança*. Ministério da Educação - IGEC. <http://www.ige.min-edu.pt>

Inspeção Geral da Educação e Ciência 2012. *Avaliação Externa das Escolas 2011-2012. Relatório*. Lisbon: Ministério da Educação - IGEC. <http://www.ige.min-edu.pt>

Inspeção Geral da Educação 2013. *Educação especial: respostas educativas 2011-2012*. Lisbon: Ministério da Educação - IGEC. <http://www.ige.min-edu.pt>

Inspeção Geral da Educação e Ciência 2012. *Avaliação externa das escolas 2011-2012. Relatório*. Lisbon: Ministério da Educação - IGEC. <http://www.ige.min-edu.pt>

Rebocho, M., M. Saragoça, and A. Candeias. 2009. “Fundamentos para educação inclusiva em Portugal”. In *Educação inclusiva: concepções e práticas*, edited by A. Candeias, 38-48. Évora: CIEP.

Teaching and Learning International Survey (TALIS) 2009-2010. *Teachers’ professional development an analysis of teacher’s professional development based on the OECD’s*. European Union.

Unesco. 1994. *Declaração de Salamanca e enquadramento da acção na área das necessidades educativas especiais*. Lisbon: Instituto de inovação educacional.

Vasconcelos, C. 2012. “Formação de professores e educação inclusiva: Uma perspetiva de docentes do 1º Ciclo do Ensino Básico na Ilha de S. Miguel.” Master diss., University Fernando Pessoa.

[Back to contents](#)

## **Prospective science teachers’ views of Problem-Based Learning**

*Sara Moutinho, Joana Torres, Raquel Martins & Clara Vasconcelos*

*Faculty of Science/Science Education Unit/Centre of Geology - University of Porto, Portugal*

sara.moutinho@fc.up.pt, joana.torres@fc.up.pt, raquel.martins@fc.up.pt & csvascon@fc.up.pt

### **Abstract**

Problem-Based Learning (PBL) is a teaching methodology which uses problems as the starting point for the development of students’ new knowledge. Many Portuguese science teachers don’t learn this methodology in their professional training, being essential to analyse the conceptions of prospective science teachers about PBL itself and their prospects of its implementation during their professional training and future practice. In the school year 2012/2013, semi-structured interviews were applied to seventeen prospective teachers studying for the masters’ degree in biology and geology teaching in a public Portuguese university. The participants recognize that students develop important competencies such as autonomy, critical thinking, and the ability to formulate questions. However, they refer as greatest difficulty in planning lessons the organization of concepts to be addressed in the scenarios. All evidences obtained pointed to PBL as an important methodology for students’ learning process which becomes more contextualized and significant with real problems and motivational scenarios.

**Keywords:** Problem-Based Learning; prospective science teachers; biology and geology; science education.

### **Context of the research**

The introduction of new teaching methodologies in the classroom has always been a controversial issue (Carrió et al. 2011). In Portugal, the extension of the science curriculum and the concern to prepare students for national exams sometimes makes teachers to forget the need to promote classes with more quality. The lack of skills development is revealed in the long term, in particular the inability to mobilize knowledge and apply it to new situations of the students’ everyday life. Moreover, to ensure students’ success in Natural Sciences it is necessary that teachers have the capability to lead them to develop many important skills beyond the knowledge acquisition (Lambros 2004). For example, it is important to promote the development of scientific reasoning, self-regulation and autonomy in the learning process. Nowadays, it is recommended the adoption of new educational approaches aiming to provide students with the development of general competencies. An example of these approaches is Problem-Based Learning (PBL) which aims to increase the competency of problem solving, autonomous learning and the ability to work collaboratively (Prince et al. 2005). PBL is a teaching methodology which uses problems as the starting point for the development of students’ new knowledge (Lambros 2004) and where they learn while searching for solutions to those problems. Students are actively involved and learn within the context in which knowledge is to be used, being active constructors of their knowledge, with the intervention of teacher as a facilitator of the process. The data presented here were obtained through interviews that were applied to a convenience sample of seventeen prospective science teachers studying for a master degree in biology and geology teaching in a public university from Northern Portugal. The interviews were audio taped and transcribed by two researchers of the research team. After the transcription, they were content analysed to facilitate the organization of the information and to gather some evidences related to the study problem.

### **Research aims**

The purpose of this study, that took place in the school year 2012/2013, was to analyse the conceptions of prospective science teachers about PBL, as well as, the difficulties, constraints and students’ learning implications of its implementation. It was intended that participants reveal their



opinions about the importance of PBL, planning stage, implementation stage and other relevant aspects of this methodology.

### **Theoretical framework**

Problem-Based Learning (PBL) is a teaching methodology usually referred to as an Inquiry-Based Learning approach because it stimulates students' requests and curiosity to solve problems, use questioning and develop investigating skills (Vasconcelos et al. 2012). In this methodology the questioning and investigation have an important role for the development of the learning process. It involves the elaboration of activities that allow students to develop knowledge and understanding of scientific knowledge, as well as, represent the processes by which scientists study the natural world (National Research Council 2008). As an inquiry approach, PBL is a dynamic and continuous process of thinking that involves flexibility and judgment. It is argued that students should have the opportunity to gather evidences, decide on its value and develop coherent scientific explanations based on the collected evidences (Dolmans et al. 2005). During science classes, in which inquiry strategies are implemented, students develop their scientific knowledge and relevant competencies, such as identifying problems, formulating questions, designing and conducting experiments and communicating those results (Abd-El-Khalick et al. 2004; Sadeh and Zion 2009).

One of the main characteristics of the methodology is that the focus is on students, encouraging them to actively participate in solving real world problems. The resolution of these problems is considered personal, social and environmentally important (Dolmans et al. 2005). Students also develop their questioning and reflexive competencies when dealing with the facts presented in the problematic scenarios. (Vasconcelos et al. 2012). As so, it is considered that the main elements of this methodology are the problems, which are presented through a problematic scenario. These problems intentionally create cognitive challenges by not providing all the necessary information, thus motivating the search for self-directed information to formulate explanations (Dahlgren, Castensson, and Dahlgren 1998). The problem leads students to identify learning objectives for the development of an explanation or hypothesis. The problem acts as stimulation to the learning processes of students (Wong and Day 2008). The investigation, group discussion and the construction of new knowledge lead them to answer the questions, which will allow them to solve the problem (Carrió et al. 2011).

This process is always mediated by the teacher, who assumes the role of a tutor. However, one of the barriers that arise in the use of PBL by teachers is the lack of qualifications to play the role of facilitators and mediate the process of learning (Hmelo-Silver 2004). Teachers who teach according to PBL have to create good problems to be discussed in class, based on the clear learning objectives. This initial process is extremely important because it is through this problem, which integrates the scenario, that the teacher promote the learning of concepts and facts related to the content of the subject to be taught. Allen, Donham and Bernhardt (2011) explain that the problems must be carefully constructed, not only to introduce students to the issues and dilemmas that are important to them, but also to promote the development of conceptual frameworks.

PBL is also recognized as a methodology that promotes understanding of the nature of science. This methodology can be effectively applied in the science lessons, ensuring the inclusion of some components of scientific processes. Gallagher and collaborators (1995) suggested that four of the essential elements of PBL can be aligned with the practice of science: i) the problems should concentrate on significant scientific concepts; ii) there must be opportunity to test the students' ideas through experimentation or field work; iii) students must manage their own data, and iv) the presentation of the solutions obtained is fundamental.

Once the problems and the related scenarios are created the role of the teacher goes through foster students' research, helping them to become self-directed learners (Torres, Preto, and Vasconcelos 2013). Although the process of PBL leads itself to a more independent learning by the students, teachers should help them through the promotion of guided and moderated discussions, asking questions that challenge students to go further and stimulating their participation (Allen et al. 2011). With the introduction of PBL in primary and secondary education, teachers have to

modify the methodology to accommodate large groups, a greater diversity of students, problems of time and planning lessons, the formation of various groups and the lack adequacy of the classroom space (Allen, Duch, and Groh 1996). It means that this methodology requires a shift in the educational paradigm.

Students who learn through a PBL approach are capable of performing an autonomous learning, especially in defining their goals, in planning their learning, access and select their own learning resources, actively studying the materials and integrating new knowledge in problem solving (Yoon et al. 2014). In other words, students need to be independent, take responsibility for their own learning, be active problem solvers, and partners of cooperation with each other. Furthermore, they develop the ability to coordinate actions and people, achieve goals and monitoring their own understanding.

According to Yoon, Woo, Treagust and Chandrasegaran (2014), learning supported in PBL can be built individually or in groups, encouraging in this case discussions and sharing opinions collaboratively, research, reflection and presentation of the final product. The collaborative work of students, normally in small groups, enhances knowledge building and develops different skills (Dahlgren, Castensson, and Dahlgren 1998; Wong and Day 2008). Its implementation is not easy.

### **Research methodology**

This study aims to analyse the conceptions of prospective science teachers about PBL, as well as the difficulties, constraints and students’ learning implications of its implementation.

The data were collected through semi-structured interviews which were applied to seventeen prospective science teachers studying for a masters’ degree in biology and geology teaching in a Portuguese public university, in the year 2012/2013. These prospective volunteers’ science teachers were a convenience sample to whom we applied an interview. The interviews were audio taped for a better and more reliable transcription. After the transcription of the interviews, a content analyses of the answers was performed to facilitate the organization of the information.

It was intended that participants reveal their opinions about the importance of PBL, its’ planning stage, implementation stage and other relevant aspects of this methodology, highlighting its advantages, disadvantages, and their difficulties and concerns.

### **Findings**

After the transcription of the interviews and the content analysis of the prospective science teachers’ answers and the organization of the information collected, the results were organised in the following indicators:

#### ***Indicator 1: Prospective science teachers’ views about the advantages and disadvantages of PBL***

In this study we want to analyse the opinions of prospective science teachers about the advantages and disadvantages of PBL methodology. Table 1 presents the answers of the participants about the importance of the methodology, the advantages of the implementation stage and the methodology importance in students’ learning.

Table 1 shows that prospective science teachers recognize that students develop important competencies such as autonomy and critical thinking, and the ability to formulate questions, to search for information, and to work in groups. All these competencies are developed in the implementation stage, where teacher has an important role as a tutor, because he helps the students to formulate the questions and to organize the information gathered.

Considering some teachers’ perspectives and by analysing the transcription, it can be concluded that PBL is considered as an inquiry approach:

“PBL promotes the questioning that is generated by a problematic situation and the students will investigate to find explanations for the problem (...) to confront their own explanations about the problem. With this confrontation they will draw conclusions with the help and guidance of the teacher, and then answer to the questions or problems that were initially given.” (Teacher 2).

Table 1. Prospective science teachers views about the advantages of PBL (n=17)

Categories	Subcategories	f
Importance of the methodology	Development of cognitive competencies	9
	Preparation of citizens	6
	Development of autonomy	4
	Development of scientific literacy	3
Implementation stage	Student's preparation for real situations	9
	Development of critical thinking	5
	Development of autonomy	3
	Promotion of collaborative work	2
Importance in students' learning	Knowledge retention	7
	Development of autonomy	5
	Development of searching competencies	4
	Promotion of collaborative work	3
	Lifelong learning	3
	Development of critical thinking	3
	Responsibility	2

However, it is important to refer that PBL is fundamental in the development of the students' learning because it promotes the knowledge retention, the development of searching skills, critical thinking and responsibility. As stated by some teachers:

“... [PBL] encourages the students' autonomy and self-confidence, (...) it is important to promote the students autonomy because our society increasingly needs people to be autonomous and they can solve their problems.” (Teacher 11).

“... [PBL] makes students more independent, able to criticize and select facts and evidence to solve a specific problem, but also help them in everyday life to solve problems that they may encounter.” (Teacher 14).

Prospective science teachers also reckon PBL as a motivating methodology that enables the development of students' literacy, by making them active and responsible citizens, through the resolution of daily problems:

“...they [students] will develop the capability to criticize, reflect and communicate to others (teacher, classmates, scholar community) what they have learned.” (Teacher 2).

“... [PBL] prepares students to face the difficulties of their everyday lives and being able to deal with everyday problems.” (Teacher 15).

The participants recognize some disadvantages in PBL methodology. Table 2 shows the results about the disadvantages of the implementation, referring to the difficulties of teachers' role (especially due to their lack of preparation) and some strong obstacles due to the characteristics of Portuguese scientific education.

Table 2. Prospective science teachers views about the disadvantages of PBL (n=17)

Category	Subcategory	f
Implementation of PBL	Time spent in the implementation of PBL	11
	Students' and classes' characteristics	5
	Students' socio-economic level	4
	Lack of educational resources	3
Teachers	Teachers' formation and preparation	7
Portuguese scientific education	Extensive curricula and programme	4
	Existence of other methodologies	4

Table 2 shows that the majority of prospective science teachers stated that the disadvantage of PBL is the time spent in its implementation (f=11). Some teachers think it is because it is necessary to spend too much time with students who are not familiar with this methodology:

“...Portuguese science teaching is not suited for this kind of methodology because there is no time, so if we say to teachers that they have to apply PBL in science lessons it will be a big problem for them...” (Teacher 4).

“I think it is the time that activities are extremely time consuming, and consider the extension of the programme it is very complicated.” (Teacher 6).

The participants also consider that teachers’ background and training were insufficient to implement PBL in an adequate manner. The lack of teachers’ training is regarded as a problem to the implementation of this new methodology (f=7), because teachers think that they need a very lengthy preparation before resorting to it:

“...teachers must know enough about the concepts on the matter to get to teach students correctly.” (Teacher 3).

“Teachers are not prepared to apply this type of methodology in class activities.” (Teacher 16).

Prospective science teachers also refer as disadvantages some aspects related to the implementation of the methodology such as students’ and classes characteristics (f=5), students’ socio-economic level (f=4) and the lack of educational resources (f=3). At last, they also refer some disadvantages related to Portuguese scientific education, such as the extension of the natural sciences’ syllabus (f=4) and the existence of others methodologies (f=4) with which teachers are familiarized and are easier to be used in the classroom.

### ***Indicator 2: Prospective science teachers’ difficulties and concerns about the methodology***

During the interviews, prospective science teachers recognize that they have some difficulties in planning lessons through PBL methodology. The following results show prospective science teachers’ opinions about their biggest difficulties and concerns in the planning and implementing PBL. The results are presented in table 3.

Table 3. Prospective science teachers’ difficulties in planning lessons through PBL (n=17)

Categories	Subcategories	f
Planning PBL Lessons	Development of attractive and motivating scenarios	9
	Connection of concepts	4
	Selection of necessary information to the scenario	2
	Search for current issues to integrate in scenarios	2
	Anticipation of students’ questions	1
	Establish the differences between objectives, purposes and applicability	1
	Formulation of a problem that promotes the questioning	1
	Correct formulation of problem questions	1

According to table 3, the participants recognize as difficulty during the lessons plans preparation the selection and organization of topics and concepts to be addressed in the scenarios (f=4). They also complain about PBL time management:

“...gather sufficient concepts to give the students enough knowledge to answer the question and to solve the problem.” (Teacher 1).

“When planning the lesson teacher has fear of failing to lead the class in the sense that he want, and disperse the information (...) it also depends on the students we have and how the class is progressing.” (Teacher 10).

Prospective science teachers also refer as difficulty the elaboration of an interesting and motivating scenario (f=9). This is an important issue because the scenarios are one of the keys of the success of PBL. They are the starting point of the methodology and they contextualize the problem that students should solve. However, teachers complain are many:

“...to find a scenario that motivates them, try to make a scenario that promotes the students’ interest to explore the theme.” (Teacher 3).

“First of all, the creativity is very important. Then, it is also fundamental to try to find an actual scenario, or problems which occurred shortly.” (Teacher14).

### ***Indicator 3: Prospective science teachers’ opinions about students’ difficulties with PBL.***

At last, the participants also gave their opinions about the difficulties showed by the students

during PBL implementation. The results are presented in table 4.

Table 4. Prospective science teachers' opinions about students' difficulties (n=17)

Category	Subcategory	f
Students' PBL difficulties	Searching	5
	Questioning	5
	Formulate explanations	2
	Collect facts and evidences	2
	Answer the questions	1
	All the process	1

Table 4 shows that the majority of prospective science teachers consider the searching for information and questioning the greatest difficulties for students (f=5). The information searching is difficult to students because they feel lost and disoriented with the amount of information that they find:

“Students may felt a bit shuffled if the paths are not well defined.” (Teachers 3).

The questioning competency was also difficult to be developed by students. Sometimes they did not know how to formulate the right questions that would led them to search for correct information:

“...formulate questions is not easy when you do not know the subject, to ask anything you need to know something about the subject.” (Teacher 11).

Moreover, participants also refer as students' difficulties the formulation of hypothesis and the collection of evidences (f=2). One of the participants considers that all the PBL process is difficult to students unfamiliar with PBL:

“If they are not used to the methodology all stages are initially difficult...” (Teacher 17).

### Conclusions and implications for teacher education

The results of the study led us to conclude that prospective science teachers recognized that PBL is important for students' learning processes which become more contextualized and therefore more significant. They also suggested that this methodology may contribute to a better retention of knowledge and development of many competencies.

Although some disadvantages were mentioned, the authors consider that this methodology is of utmost importance for students' development and learning given its recognized and suggested advantages. As so, the authors consider that it is crucial to explore and better understand the full potential of PBL, particularly in terms of students' knowledge retention and the development of critical thinking, questioning, searching for information, collaborative work and the promotion of scientific literacy. Also, we consider that more research is needed in order to make possible the gradual adaptation of PBL requirements to Portuguese Education context. We believe that it is crucial to integrate this methodology in initial professional training, internship and professional development of science teachers, in order to facilitate teachers' implementation of this methodology in science classes. If PBL is a methodology that prepares students and helps them to solve problems of their everyday life, some efforts must be made towards its implementation in science classrooms.

### References

- Abd-el-Khalick, F. et al. 2004. “Inquiry in science education: international perspectives.” *Science Education* 88 (3): 397-419. doi: 10.1002/sce.10118.
- Allen, D., R. Donham, S. Bernhardt. 2011. “Problem-based learning.” *New Directions for Teaching and Learning* 128: 21-29. doi: 10.1002/tl.465.
- Allen, D., B. Duch, S. Groh. 1996. “The power of problem-based learning in teaching introductory

science courses.” In *Bringing problem-based learning to higher education: theory and practice. New directions for teaching and learning series*, edited by L. Wilkerson, and W. Gijsselaers. San Francisco: Jossey-Bass.

Carrió, M., P. Larramona, J. Baños, and J. Pérez. 2011. “The effectiveness of the hybrid problem-based learning approach in the teaching of biology: a comparison with lecture-based learning”. *Journal of Biological Education* 45(4): 229-235. doi:10.1080/00219266.2010.546011

Dahlgren, M., R. Castensson, and L. Dahlgren. 1998. “PBL from teachers’ perspective: conceptions of the tutor’s role within problem based learning” *Higher Education* 36(4): 437-447. doi: 10.1023/A:1003467910288.

Gallagher, S., W. Stepien, B. Sher, and D. Workman. 1995. “Implementing problem-based learning in science classrooms.” *School Science and Mathematics* 95 (3): 136-146. doi:10.1111/j.1949-8594.1995.tb15748.x.

Hmelo-Silver, C. 2004. “Problem-based learning: what and how do students learn?” *Educational Psychology Review* 16(3): 235-266. doi:1040-726X/04/0900-0235/0.

Dolmans, D., W. Grave, I. Wolfhagen, and C. Van Der Vleuten. 2005. “Problem-based learning: future challenges for educational practice and research” *Medical Education* 39: 732-741. doi:10.1111/j.1365-2929.2005.02205.x.

Lambros, A. 2004. *Problem-based learning in middle and high school classrooms: a teacher’s guide to implementation*. California: Corwin Press.

National Research Council. 2008. *Inquiry and the national science education standards: a guide for teaching and learning*. Washington: National Academic Press.

Prince, K., P. Van Eijs, H. Boshuizen, C. Van Der Vleuten, and A. Scherpbier. 2005. “General competencies of problem-based learning (PBL) and non-PBL graduates.” *Medical Education* 39: 394-40. doi:10.1111/j.1365-2929.2005.02107.x.

Sadeh, I. and M. Zion. 2009. “The development of dynamic inquiry performances within an open inquiry setting: a comparison to guided inquiry setting.” *Journal of Research in Science Teaching* 46 (10): 1137-1160. doi: 10.1002/tea.20310.

Torres, J.; C. Preto, and C. Vasconcelos. 2013. “PBL environmental scenarios: an analysis of science students and teachers questioning.” *Journal of Science Education* 14 (2): 71-74.

Vasconcelos, C., M. Amador, R. Soares, and T. Pinto. 2012. “Questionar, investigar, e resolver problemas: reconstruindo cenários geológicos.” *Investigações em Ensino de Ciências* 17 (3): 709-720.

Wong, K. and J. Day. 2008. “A comparative study of problem-based and lecture-based learning in junior secondary school science.” *Research in Science Education* 39: 625- 642. doi: 10.1007/s11165-008-9096-7.

Yoon, H., A. Woo, D. Treagust, and A. Chandrasegaran. 2014. “The efficacy of problem-based learning in an analytical laboratory course for preservice chemistry teachers.” *International Journal of Science Education* 36 (1): 79-102. doi:10.1080/09500693.2012.727041.

[Back to contents](#)



## “The social contract”: on university teacher professionalism, structure, and agency

*Mai Trang Vu*

*Umeå University, Sweden*

trang.vu@umu.se

### Abstract

Professionalism perceived more conventionally is an occupational set of virtues or “essence”, while a critical conceptualisation of the notion is related to political dimension that makes it subject to social and power relations. Recent discussions on “professionalism” in literature while revealing the complexity of “professionalism” seem to highlight the political aspect of the concept and emphasise the determining role of external power discourses. Seeing “professionalism” as being socially constructed but with a more visible focus on the role of teachers, this paper explores the concept in the contemporary higher education context using the interaction between “agency” and “structure” as an analytical lens. In doing so, the paper argues for a potential of understanding “professionalism” as a “social contract”: it is based on a more reciprocal relationship between university teacher agency and their social discourse.

**Keywords:** teacher professionalism; higher education; agency; structure; social contract.

### Introduction to the topic

Professionalism, including teacher professionalism, is a shifting, contested notion (Gewirtz et al. 2009; Sachs 2013). Over the years the discussion on professionalism seems to evolve around two different interpretations: one that defines professionalism as an occupational value and one that focuses more on the critical, political aspect of the concept (Evetts 2009; Lester 2011). With states’ educational reform and the mechanism known as “managerialism” spreading their impact on universities, the critical dimension of “professionalism” seems to be more emphasised. Professionalism is now interpreted as a discourse - the discourse of professionalism (Evetts 2009, 2013) - it is a political product of the controlling structure (e.g. Ozga 1995; Day and Sachs 2004; Ball 2003, 2012).

With different conceptualisations of the notion including “managerialism professionalism” (Sachs 2003; Whitty 2008) and “organisational professionalism” (Evetts 2009), professionalism is interpreted as being the cultural product of external social structure and this type of professionalism constrains in many ways professionals from exercising their own truly “occupational professionalism” (Evetts 2009). In the context of teaching, this imposing professionalism has been criticised to have changed teachers’ skills, their work, and even their identity and soul (Ball 2003, 2012). Professionals are described as having become “regulated” (Barnett 2008, 192). Through the sociological lens of agency and structure, the current analysis of “professionalism” has positioned teachers and social structures as an oppositional pair, in which structure has a determining power over the shaping of “professionalism” while individual agency seems to have little room.

Resonating with the view that sees “professionalism” as being socially constructed, the paper however moves away from the understanding that sees the notion as (decisively) resulting from ideologies and power relationship: rather, it is based on a reconciliation between agency and structure. Expanding from this premise, the paper proposes “social contract” - an agreement between individual professionals and the society, as a conceptualisation approach to understanding “professionalism”.

To achieve this, the paper will first provide an introduction to the conceptual base used, including agency, structure, and social contract. That “professionalism” is both an occupational value and a social coordination will then be discussed, and this proposition explains why “agency and structure” can be relevant in analysing the concept. From this premise, an analysis of “professionalism” through the lens of structure and agency is provided. Drawing upon the existing literature on the notion, the paper argues for the need to further explore the interaction between the



professionalism discourse (structure) and professionals (agent). The discourse of professionalism is not static but has a dynamic nature where “from within” and “from above” interlink, likewise professionals are not simply “victims” being governed and regulated, but they exercise agency in particular ways in responding to the discourse. Through this, features that make “professionalism” close to the nature of a “social contract” are unravelled. In doing so, the paper argues for a possibility for applying “social contract” in reading “professionalism” with an attention to the interconnection between university teachers and the discourse of professionalism.

### **The aim of argument**

This paper explores the concept of “professionalism” in the contemporary higher education context using the interaction between “agency” and “structure” as an analytical lens. In doing so, the paper argues for a potential of understanding “professionalism” as a social contract: it is based on a more reciprocal relationship between university teacher agency and their social discourse.

### **Theoretical framework**

#### ***The structure/agency interdependency and the social contract***

“Agency” is a social science term which states that individuals - agents, with their intelligence, traits, and properties, have the capacity to act independently and make own free choices, while “structure” refers to the factors that determine or hinder an agent and his/her decisions (Barker 2005). The debate on whether agency or structure takes primacy has been long discussed, and may be irresolvable (Priestley, Edwards, and Priestley 2012). The paper however adopts a middle ground position that acknowledges human beings as knowledgeable actors but their action is not independent of the social structure. Agency is seen as constituent of structure, and human agents are “knowledgeable” enactors of structures (Giddens 1991), and there is interdependency between agency and structure.

Analysing the interplay between agent and structure, the individual and the society, Giddens (1984, 1991) introduces his concepts of structuration and the knowledgeable of human agents. Characterising social structure as “dual”, Giddens sees structure as a process rather than a static state, and thus it must not be simply conceptualised as putting constraints on human agency, but also as enabling (Giddens 1984, 161). Social structure is thus dynamic, interactive: it is constituted not only by properties but also relations; it is in a process of continuing, transformation and reproduction.

Meanwhile, to be a human being, to Giddens, is “to know, virtually all of the time, in terms of some description or another, both what one is doing and why one is doing it”, and as such human agents continuously monitor the circumstances of their activities (Giddens 1991, 35). At the same time, human self monitoring always has a discursive nature: “agents are normally able, if asked, to provide discursive interpretations of the nature of, and the reasons for, the behaviour in which they engage” (Giddens 1979, 55). Human agency and structure according to Giddens thus “presuppose” each other (Giddens 1979, 53). There is a mutual relationship between structure and agency: structures determine human practices, but human practices also shape structures.

It is this view highlighting the interplay between the dynamic social structure with the knowledgeable human agents that makes it possible to associate the concepts of “agency” and “structure” with “social contract”. Social contract, as a sociological concept, is characterised “by an agreement between two or more parties, underpinned by informed consent, where there is reasonable trust that the expectations of a future outcome will be met” (Rawolle 2013, 233-234). In a social contract, the parties can be individuals, groups, institutions or nations, and their transactions are embedded in social networks (Robin 2012, Rawolle 2013). Social contract has a core principle of social reciprocity, or mutuality (Yeatman 2000, Robin 2012, Rawolle 2013). The underpinnings of social contract include trust, commitments, mutual expectations and obligations, and reciprocal social bargains (Rawolle 2013). In this way, “social contract” specifies the

relationship between social structure and human agents: they are parties with mutual understanding of rights and obligations and the realisation of the contract is driven by acknowledging and considering each party’s agency.

### ***What is professionalism?***

Acknowledging the complexities of “professionalism”, researchers have attempted to read this concept from different perspectives. In the literature on professionalism, two main meta-level approaches have been used to conceptualise the notion. The first approach sees professionalism from a trait-based perspective; it is interpreted as a set of features that an occupation should have in order to be termed a profession (Whitty 2008; Evans 2010; Lester 2011). The second approach focuses more on the critical aspect and treats professionalism as resulting from particular ideologies or social systems (Ozga 1995; Weiner 2002; Hudson 2009). The issues discussed in studies following this approach often include status, positioning, and legitimation.

This paper resonates with Gewirtz et al.’s (2009, 4) view seeing professionalism “both as a mode of social coordination and as shorthand for a (shifting and contested) set of occupational virtues”. Evetts (2013, 8) also agrees that since “professionalism” is regarded as a discourse, this has, to an extent, “combined the occupational value and the ideological interpretations”. Similarly, my paper holds that “professionalism” is an always politically embedded notion whether it is interpreted from an occupational-value perspective or a critical perspective. A list of aspired traits and features cannot come out of a vacuum, and since they are value embedded, whether to the occupation or to a power or ideology, there seems to be always the question of power involved. For teachers, “doing a good job” cannot be separated out from a concern about individual and collective autonomy and power (Gewirtz et al. 2009). In other words, the descriptive question of “What is professionalism?” cannot be separated from the other political questions of “Who has the power to decide what counts as professionalism? And for whose interest?”; at the same time, to seek the answer to the political questions it is necessary to take into account in the first place the descriptive question.

Adopting this perspective towards how to read “professionalism”, it seems that “agency” and “structure” can be useful because the two concepts deal with the relationship between human individuals and social discourse and the question of power and primacy.

### ***Professionalism as structure and professionals as agents: “from above” and “from within”***

One important concept that has been closely discussed with “professionalism” is “professionalism” - the process that shapes or creates professionalism. In current literature, “professionalization” is found to entail different nuances but it seems two main interpretations can be identified. “Professionalisation” of work refers to the process of raising the status or to validate the value of occupational groups (Weiner 2002; Evetts 2009). In this way of professionalisation, external rules are minimised to give place for trust and recognition to the professionals given their special status and recognised competences (Freidson 2001, 34). On the other hand, “professionalization” can be perceived as a process of occupational control (Ozga 1995, 21), and to legitimate “disparate neo-liberal government policies” (Weiner 2002, 277). As such, professionalisation can be associated with “strategy” (McClelland 1990) or even becomes “professionalising project” (Larson 1977). The professionalising project is conducted to achieve particular goals. As such, it seems that these two readings of “professionalization” are based on an interest-based principle that the work possesses particular values either to the public or to the benefits of the state or an elite (Freidson 2001, 214). What distinguishes them perhaps lies in “who” has the “power” to initiate the professionalisation process. Again, the political question of “Who can decide what counts as professionalism?” needs to be considered. With this stance, the paper adopts the categorisation of professionalisation by McClelland (1990) which differentiates professionalisation “from within” and “from above”. Professionalisation “from within”, as McClelland (1990, 107) puts it, is regarded as the attempt to successfully manipulate the market, or even the state, by the occupational group for its own benefits, while professionalism “from above”

means a domination of forces external to the group. As such, this conceptualisation reflects the very question of how much power and autonomy occupational groups and individuals have in creating their own standards.

*The contemporary higher education professionalism: professionalisation “from above”?*

The contemporary interpretation of professionalism can be said to have started in the 1970s which expanded from the more critical literature on professions which was prominent in Anglo-American studies of the time (Lester 2011). This time witnesses the significant influence of external structure such as the state or local authority on teacher professionalism as it was more legislatively driven and controlled (Larson 1977). This trend of professionalisation continues to the present day with a discourse of control used by managers in work organisations, which results in what is termed as managerial professionalism and organisational professionalism (Sachs 2003; Whitty 2008; Evetts 2009). Legitimatised through the promulgation of policies and the allocation of funds with the policies, managerial professionalism is mandated by the state (Day and Sachs 2004) and is driven by a discourse of control of system, external regulation, and standardised procedures (Whitty 2008). At the level of organisation, organisational professionalism is characterised by a discourse of control used increasingly by managers in work organisations, hierarchical rational-legal forms of authority, standardisation, externalised forms of regulations and accountability measures (Evetts 2009, 23).

In this way, although “professionalism” is perceived as being socially constructed, the current emphasis seems to be placed on the dominant role of external forces. “Professionalism” thus is regarded as the outcome of “professionalization” projects which constraint academics and the profession rather than enabling them (Evetts 2009; Lester 2011). The organisational professionalism regulates and replaces occupational control of the practitioner/client work interactions (Evetts 2009, 23). In other words, the contemporary professionalism is seen as being constructed and imposed “from above”, using McClelland’s interpretation (Evetts 2009). The professionalisation “from above” creates a “from above” “professionalism”: professionalism is being constructed and imposed by the employers and managers and not the traditional occupational values (Evetts 2009, 22).

Placed in contemporary higher education, “professionalism” takes up additional political dimensions that go beyond occupational elements. In many parts of the world there seems to be an enormous interest, politically and administratively, by governments, bureaucracies, and businesses, in identifying, codifying, and applying professional standards to teachers (Hargreaves and Goodson 1996, 1). The discourses of the knowledge economy and the “new managerialism” are said to have adjusted or re-positioned the work and identities of teachers (Deem and Brehony 2005, Loveless and Williamson 2013).

*University teachers in the professionalism discourse: trapped by the “from above” discourse?*

As mentioned earlier, the contemporary discourse of professionalism has been perceived to have profound effects on professional work and identities. The present professionalism, long associated with managerialism, has been described to have transformed the conceptions of what it meant to be a professional (Apple 2009, xiv). The professionalisation “from above” emphasises performance, accountability, measurement, productivity and requires one to be regulated and act “appropriately” by having “appropriate” work identities, conducts and practices (Apple 2009; Sachs 2013). Critiques describe the influences of this professionalising project as damaging: it deskills teachers, de-professionalises them, and destroys their academic soul (Ozga 1995; Ball 2003, 2012).

In another critique, Power (2008, 145) uses “professional imagination” to enable professionals to make sense of the contemporary challenges of professional life. Power conceptualises the difficulty of being a contemporary professional by her depiction of “the distressed professional” (in terms of individual and/or institutional failings), and “the oppressed

professional” (in terms of structural forces beyond the individual or the institution). Meanwhile, Barnett (2008) is concerned about the uncertainties of being a professional in “an age of supercomplexity”. Not only that the professional now lives with multiple identities, he or she “neither has his or her “professionalism” given in any real sense nor has carte blanche to shape it” (Barnett 2008, 196).

### ***Professionalism as a social contract***

#### *The possibility of a “from within” professionalism*

Professionalism cannot seem to exist without the exercise of practitioners’ will and power. To say it differently, professionalism has a nature of “from within”.

To start with, the word “professionalism” can be de-constructed into the noun “profession”, and historically “profession” applied to only three “great professions of divinity, law, and physics” (Prest 1987, quoted in Hudson 2009, 19). In his review article, Crook (2008) provides a description of how the so-called “classical professions” and “professional elites” of theology, medicine, and law emerged with the development of the modern state. The mid-nineteenth century saw the expansion of “old professions” to include university academics in Britain and across Western Europe and North America and as a result of a “professionalization” of higher education driven by meritocracy, urbanisation, industrialisation, imperialism, modernisation and scientific rationality (Crook 2008, 14). These historical accounts imply that from the early day “professionalism” already entails a process of practitioners and occupational groups seeking for recognition, whether it is for an “individualised professionalism” with which professionals strive to win customers trust and satisfaction and recognition, or for a political, ideological professionalism that serves the benefits of its occupational groups or of a particular ideology or power structures. Professionalism, in one sense, constitutes the amalgam of individual’s professionalities - the qualities that a practitioner needs to have to be a professional (Evans 2008).

Hoyle (1974, 15) defines professionalism as strategies and rhetorics used by members of an occupation in seeking for better status, salary and conditions. As such, professionalisation in this sense happens voluntarily through the acquiring of the aspirational attributes. Consequently “professionalization” is indeed not always negative, and controlled. It is the desirable important characteristics that entitle professionals and professional associations to rights, power and privileges. Historically these are the motives for “professionalisation project”, especially for specialist occupations during the Industrial Revolution such as the priesthood, university teaching, law and physicianship (Lester 2011). Attempts to professionalise a particular occupation are motivated by practitioners’ wish to gain control of their field. “Successful” professionalisation is perceived as the “domination of the conditions under which professionals exercises their occupations, whether described as “autonomy” or ‘market monopolisation” (McClelland 1990, 98). Not only they will have market share - the control can provide autonomy that help them move away from market and bureaucratic forces to some degree (Freidson 2001).

Moreover, professionalism, and the professionalism discourse, is not always necessarily a battlefield where practitioners’ professionalism, and their process of professionalising have to confront the “outside” discourse. In other words, “from within” professionalism can be inextricably linked with “from above” professionalism. The interests of practitioners, or professionals, can in many cases, be in line with those of the “from above” forces. Traditionally the notion “professionalism” is interpreted in sociology with an importance for the stability and civility of social systems (Evetts 2009). Professionalism, as discussed in the next section, is a social contract, and since it is a “contract”, all parties involved have their own voices and responsibilities.

#### *Professionalism as a social contract: an interpretation of Freidson’s “Third Logic”*

Professionalism, as explored in the previous section in connection with “professionalization”, can be understood beyond the binary either-or classification of professionalisation “from within” or “from above”. Furthermore, “from within” and “from above”

professionalisms can well co-exist yet not resist nor oppose each other. It is rather a social contract where involving parties have, and are aware of, their own rights and responsibilities, as well as those of others’.

Built on the view that interprets professionalism as a socially constructed concept, and given its stance arguing for the interconnection of the “from within” and “from above” nature in conceptualising “professionalism”, the paper shifts the concentration to practitioners and their role in this process by discussing professionalism as a social contract. To justify this an interpretation of Freidson’s “Professionalism: The Third Logic” (2001), considered among the important works on professionalism, will be provided.

In this book, Freidson (2001) calls professionalism “The Third Logic” in discussion with the logics of the free market and of the bureaucracy or firm. While professionals are identified with expertise, which entails autonomy, their logic needs to interact with the other two logics: that of the market that celebrates customer satisfaction, competition and cost, and that of bureaucracy that promotes efficiency through standardisation and regulation. Although Freidson emphasises that the three logics directly differ, he also notes that professionalism, the Third Logic, interacts with the other two: “Even when those called professionals are something more than average people, few can be immune to the constraints surrounding the work they do” (Freidson 2001, 12). For Freidson, individuals can hardly actively concern themselves with their occupational professionalism if the institutions and circumstances surrounding them fail to support. Professionalism is subject to sources of social order as Freidson acknowledges the question of how occupations are nurtured and controlled is central. In this sense, professionalism is understood beyond the scope of a set of occupational attributes, either individually or collectively. Professionals have a “contract” with the wider society (Gewirtz et al. 2009, 4). The relationship between professionals and the society is based on trust: professionals are entitled to be trusted, but they also need to work to win that trust. As Gewirtz et al. (2009, 4) put it, professionalism needs to be “both a regime of control and ideology”. In other words, the concept of professionalism contains not only aspired idealistic occupational virtues but it involves other interactions between the professionals and the society.

However, this social contract is not without tensions and even contradictions. In an ideal world Freidson’s three logics can work in harmony and they become a single logic: professional virtues and attributes are not contested, trust is completely in place, and there is no conflict between aspiration and reality commands. However, as the three logics exist separately, their interactions may turn out to be conflicting, especially when there exists a conflict of interests. Freidson highlights these contradictions between professionalism and the market and the bureaucracy as:

“...monopoly is essential to professionalism which directly opposes it to the logic of competition in a free market. Freedom of judgement or discretion in performing work is also intrinsic to professionalism, which directly contradicts the managerial notion that efficiency is gained by minimizing discretion” (Freidson 2001, 3).

Whether the interactions are fruitful or not, nevertheless, professionalism will always in the first place have a coordination relationship with the other logics - the external social forces, involving acknowledging, negotiating, trading off, sacrificing or even demolishing and surrendering.

#### *University teachers: signing the social contract of professionalism?*

With the contemporary discourse of teacher professionalism depicted with more focus on its controlling dimension - it is a form of social determinism, the practitioner, or the professional, are seen as being regulated to respond to the system. However, given the argument discussed earlier, the discourse of professionalism is dynamic and is not easy to be regarded as being created “from within” or “from above”; rather, the two dimensions can be said to interlink which gives the concept a socially constructed nature in which teachers and social structure interact and respond to each other.

Indeed, teaching seems to be one of the occupations where practitioners have the opportunity to exercise their agency. Teaching, including teaching in higher education, teachers are able to preserve their control of how they work with learners in the classroom despite changing mandates

(Knight 2003). In particular, being a university educator implies a special status brought about by expertise and merit and characterised by academic freedom (Getman 1992). Teaching is a process that involves independent professional decision-making (Leung 2013). Structures have impact, yet teachers may often find space to avoid accommodating their existing practices to new mandates and find ways to make the mandates fit what they value and feel easy doing (Knight 2003). However, teachers do not act in isolation with their conditions. As Leung (2013, 22) puts it, professionalism is not a natural phenomenon but it is “best seen as a form of temporary consensus among key stakeholders.” In their work, teachers have a multiple positioning: they position themselves politically and socially to their audience (peer teachers, students, the wider community) by their own modification and accommodation (Leander and Osborne 2008).

That teachers are not passive agents implies that in understanding the relationship between teachers and their discourse more than a social determinism perspective is necessary. Alongside with critical accounts conceptualising the contemporary “from above” discourse of professionalism with its damaging impact towards teacher professionals, recently there has been more empirical evidence on how there exists a responsive relationship between teacher agency and social structure. Research increasingly starts to shift the emphasis to agency at a local, specific level and shows how teachers’ response and react to externally driven change, especially educational reform and curriculum change. For example, in her research in a UK university, Clegg (2008, 329) points out that despite all the pressure of performativity and managerialism, teachers still “create spaces for the exercise of principled personal autonomy and agency” describing their identities in terms of what they value. Similarly, Borg (2013) observes in his research that teachers have a way to compromise between striving for professional legitimacy and realising their own values and priorities. In their research conducted in the context of education reform in the US, Leander and Osborne (2008) finds that teachers establish a responsive relationship between their positioning, identity and practices with their contexts. Priestley, Edwards, and Priestley (2012) with their study in a school in Scotland also emphasise the interaction between teachers and the discourse: teachers have different potential for agency, and this is dependant on temporal conditions. On the other hand, it has been observed that social structure, in this case educational policies of different levels can be read as referencing social contracts between different parties and underpinning three principles of informed consent, points of renegotiation at specific times while they are enacted (Rawolle 2013).

All of the above suggests that teacher agency, in particular university teacher agency, needs further exploration in terms of how it dynamically interplays with social structure in co-constructing the discourse of professionalism. More specifically, this relationship may be regarded as a social contract where each party responds to each other’s expectation while fulfil their obligation in order to optimise the outcome of the contract. These empirical studies mentioned above on the one hand highlight how teachers achieve and enact their agency, and respond to social discourse; on the other hand, they could be interpreted as illustrating how teachers and social structure work together to achieve a form of “win-win” solution. At this point I am proposing social contract as a potential lens to reimagine professionalism. As discussed earlier, given that professionalism, as structure, has the dynamic nature where “from within” and “from above” dimensions, and that professionals, as agents, are knowledgeable actors who are active and responsive, it seems professionalism can be explained to follow the logic of social contract: reciprocity. This opens up a possibility for a re-conceptualisation of “professionalism” beyond the view that sees the notion as being deterministically created by social structure and that gives professionals little room for agency. Moreover, social contract seems relevant for exploring the relationship between professionals and the discourse of professionalism since it provides a theoretical way to understand society and society and social changes at multiple levels of analysis and in multiple contexts, especially the connection between individual and public issues (Rubin 2012).

## Concluding remarks and implications for teacher education

By discussing the complexity of professionalism as possessing an interconnected nature of “from within” and “from above” discourses, the paper has argued that the notion can be interpreted from a perspective that reconciles the structure/agency dichotomy rather than a view regarding social structure as being deterministic towards individual professionals. To be more specifically, “professionalism” can be read as a “social contract” between the knowledgeable actors and the society. This is a contract where participating parties all have roles regardless whether the contract may encompass tensions and contradictions. However being under a contract also means at some point the contradictions will have to be negotiated and resolved in a way. This argument raises the need for further exploring the realities of how university teachers perceive and respond to the contemporary discourse of professionalism surrounding them. Additional understanding of university teachers’ work and their perception of the profession and professional self will also inform the design and implementation of faculty professional support activities as well as teacher preparation programmes that emphasise “education” along with “training”. Also, the decision-making process on both micro-level by individual teachers and macro-level by “structure” authorities will also benefit in consideration of the interconnectedness of professionalism as a social contract.

## Acknowledgements

I am grateful to Professor Nafsika Alexiadou, Associate Professor Carin Jonsson, Professor Janet Enever, Umeå University, Sweden for their constructive comments on the earlier versions of this paper. I would also like to thank ATEE 2014 conference participants and anonymous reviewers for their helpful contribution.

## References

- Apple, M. 2009. “Foreword”. In *Changing teacher professionalism: international trends, challenges and ways forward*, edited by S. Gewirtz, P. Mahony, I. Hextall, and A. Cribb, xiv-xvii. London: Routledge.
- Barker, C. 2008. *Cultural studies: theory and practice*. London: Sage.
- Ball, S. 2003. “The teacher’s soul and the terrors of performativity.” *Journal of Education Policy* 18 (2): 215-228.
- Ball, S. 2012. “Performativity, commodification and commitment: an I-spy guide to the neoliberal university.” *British Journal of Educational Studies* 60 (1): 17-28.
- Barnett, R. 2008. “Critical professionalism in an age of supercomplexity.” In *Exploring professionalism*, edited by B. Cunningham, 190-207. London: Bedford Way Press.
- Borg, S. 2013. *Teacher research in language teaching: a critical analysis*. Cambridge: Cambridge University Press.
- Crook, D. 2008. “Some historical perspectives on professionalism.” In *Exploring professionalism*, edited by B. Cunningham, 10-27. London: Bedford Way Press.
- Day, C., and J. Sachs. 2004. “Professionalism, performativity and empowerment: discourses in the politics, policies and purposes of continuing professional development.” In *International handbook on the continuing professional development of teachers*, edited by C. Day, and J. Sachs, 3-32. Maidenhead: Open University Press.
- Deem, R. and K. Brehony. 2005. “Management as ideology: the case of “new managerialism” in higher education.” *Oxford Review of Education* 31 (2): 217-235.
- Evetts, J. 2009. “The management of professionalism: A contemporary paradox.” In *Changing teacher professionalism: international trends, challenges and ways forward*, edited by S. Gewirtz, P. Mahony, I. Hextall, and A. Cribb, 19-30. London: Routledge.
- Freidson, E. 2001. *Professionalism: the third logic*. Cambridge: Polity.
- Evans, L. 2008. “Professionalism, professionalism and the development of education professionals.”

*British Journal of Educational Studies* 56 (1): 20-38.

Evans, L. 2010. Towards a better understanding of academic professionalism: introducing a new model as an analytical tool. SRHE Conference, Newport, UK, December 14-16.

Getman, J. 1992. *In the company of scholars: the struggle for the soul of higher education*. Austin: University of Texas Press.

Gewirtz, S., Mahony, P., Hextall, I., and A. Cribb. 2009. “Policy, professionalism and practice: understanding and enhancing teachers’ work.” In *Changing teacher professionalism: international trends, challenges and ways forward*, edited by S. Gewirtz, P. Mahony, I. Hextall, and A. Cribb, 3-16. London: Routledge.

Giddens, A. 1979. *Central problems in social theory: action, structure and contradiction in social analysis*. Berkeley, CA.: University of California Press.

Giddens, A. 1984. *The construction of society: outline of the theory of structuration*. Berkeley, CA.: University of California Press.

Giddens, A. 1991. *Modernity and self-identity: self and society in the late modern age*. Cambridge: Polity Press.

Hargreaves, A. and I. Goodson. 1996. “Teachers’ professional lives: aspirations and actualities.” In *Teachers’ professional lives*, edited by I. Goodson and A. Hargreaves, 1-27. London: Falmer Press.

Hoyle, E. 1974. “Professionalism, professionalism and control in teaching.” *London Educational Review* 3 (2): 13-19.

Hudson, A. 2009. *New professionals and new technologies in new higher education? Conceptualising struggles in the field*. Umeå: Umeå University.

Knight, P. T. 2002. *Being a teacher in higher education*. Open University Press.

Larson, M. S. 1977. *The rise of professionalism: a sociological analysis*. Berkeley, CA.: University of California Press.

Leander, K. and M. Osborne. 2008. “Complex positioning: teachers as agents of curricular and pedagogical reform.” *Journal of Curriculum Studies* 40(1): 23-46.

Lester, S. 2011. Professionalisation and professionalism in UK further education and training: A commentary. Background paper for the LSRN national research conference, London. 11 June. <http://www.sld.demon.co.uk/fe.pdf>.

Leung, C. 2013. “Second/additional language teacher professionalism: What is it?” In *Symposium 2012: Lärarrollen I svenska som andraspråk*, edited by M. Olofsson. Stockholm: Stockholms universitets förlag.

McClelland, C. 1990. “Escape from freedom? Reflections on German professionalisation 1870-1933.” In *The formation of professions: knowledge, state and strategy*, edited by M. Burrage and R. Torstendahl, 97-113. London: Sage.

Ozga, J. 1995. “Deskilling a profession: professionalism, deprofessionalism, and the new managerialism.” In *Managing teachers as professionals in schools*, edited by B. Hugh and R. Saran, 21-37. London: Kogan Page.

Power, S. 2009. “The imaginative professional.” In *Exploring professionalism*, edited by B. Cunningham, 144-160. London: Bedford Way Press.

Priestley, M., R. Edwards, and A. Priestley. 2012. “Teacher agency in curriculum making: agents of change and spaces for manoeuvre.” *Curriculum Inquiry* 42 (2): 191-214.

Rawolle, S. 2013. “Understanding equity as an asset to national interest: developing a social contract analysis of policy.” *Discourse: Studies in the Cultural Politics of Education* 34 (2): 231-244.

Rubin, B. 2012. “Shifting social contracts and the sociological imagination.” *Social Forces* 91(2): 327-346.

Sachs, J. 2003. *The activist teaching profession*. Buckingham: Open University Press.



Sachs, J. 2013. “Teacher Professionalism: Why are we still talking about it?” *Proceedings of the 37th Annual Conference of ATEE ‘Teacher Education Policies and Professionalisation’*. Brussels: ATEE.

Weiner, G. 2002. “Uniquely similar or similarly unique? Education and development of teachers in Europe.” *Teaching Education* 13 (3): 273-288.

Whitty, G. 2008. “Changing modes of teacher professionalism: Traditional, managerial, collaborative and democratic.” In *Exploring professionalism*, edited by B. Cunningham, 28-49. London: Bedford Way Press.

Yeatman, A. 2000. “Mutual obligation: what kind of contract is this?” In *Reforming the Australian Welfare State*, edited by P. Saunders, 156-176. Melbourne: Australian Institute of Family Studies.

[Back to contents](#)



# University of Minho





# AEE

## ANNUAL CONFERENCE 2014



**TRANSITIONS IN  
TEACHER EDUCATION AND  
PROFESSIONAL IDENTITIES**

**Proceedings**

**August, 25 to 27**

University of Minho, Braga, Portugal