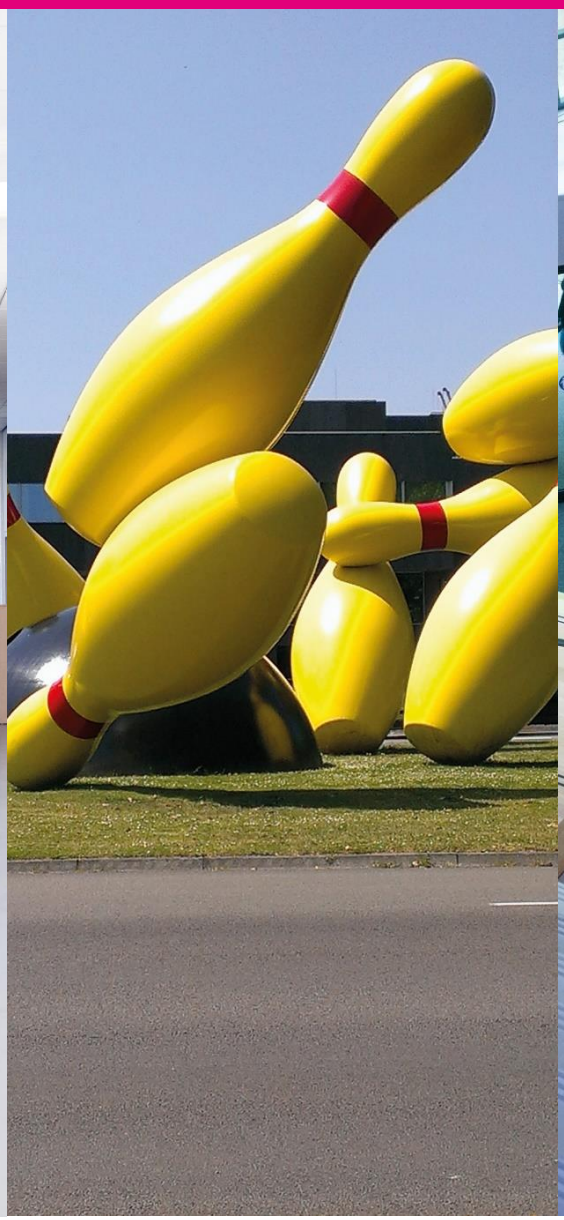
# 41st Annual ATEE Conference

Association for Teacher Education in Europe


# Educating the Best Teachers:

## a Challenge for Teacher Education

Fontys University of Applied Sciences, Eindhoven, The Netherlands

# Proceedings

## 41st Annual ATEE Conference

Educating the Best Teachers:

A Challenge for Teacher Education

# Educating the Best Teachers: a Challenge for Teacher Education
# Proceedings of the 41st Annual ATEE Conference

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# Introduction

*Quinta Kools*

The Education Department of the Fontys University of Applied Science was delighted to welcome and host the Association for Teacher Education in Europe's (ATEE) 41st Annual Conference 2016 in Eindhoven, the Netherlands.

The 41st Annual ATEE Conference focused on the important task of teacher education to educate the best teachers, teachers who are able to stimulate the cognitive and personal development of pupils, teachers who are innovative and able to develop themselves continuously. What this means for teacher education was the central focus of this conference.

The conference theme was dealt with in three subthemes:

*1. Innovation*
Teacher educators should be innovative professionals using or conducting research in order to continuously improve education. How can teacher (educator) research support the innovation of (teacher) education?

*2. Professional roles of teacher educators*
Teacher educators fulfil a lot of different roles. Do teacher educators recognise these roles and how do they value them?

*3. School-based teacher education*
Learning during the practicum is often left to chance and a conceptual framework for this type of learning is missing. What kind of educational arrangements help to widen and deepen learning at the workplace?

**Characteristics of the conference**
At the conference interaction and exchange between participants were encouraged by means of active presentation formats and a variety of meetings. Keynotes were discussed in smaller groups, possibilities were created to meet other conference participants, speed dates were held to find international sparring partners and collaboration was stimulated.
In this conference, we aimed to bridge theory and practice in order to increase the impact of research on the practice of teacher education. To do so, we wanted to encourage active exchange and interaction between the participants of the conference, who bring with them so many interesting points of view. Therefore, various presentation forms were scheduled in the programme, which all aimed to secure in-depth discussions and a high level of interaction.
To encourage interaction in the sessions, we asked a special group of experienced teacher educators to chair the sessions. They used several communication techniques and didactics to make sure that participants actively interacted with each other and with the content of the session.

All presentations at the conference were submitted after a reviewing procedure by the academic committee of the conference. This meant that each abstract has been reviewed by two reviewers against the following criteria:

- Relevance of the topic to the ATEE annual conference theme or sub-theme and relevance to one of the ATEE's RDC's;
- Significance for educational practice, policy or theory in teacher education;
- Originality, quality and clarity of research and/or focus of enquiry;

***Proceedings of the conference***

The conference itself provided the participants with an opportunity to share their research, their good practices and ideas in presentations and workshops.
Next to the conference, this book of proceedings offers an opportunity for participants of the conference to share a bit more of the background of their research or good practice with others, through the publication of a full paper.

All presenters of a paper, symposium or poster received an invitation to submit a full paper for the proceedings. All incoming full papers were peer-reviewed by the RDC-chairs of the RDC to which a paper was connected. Each paper was reviewed by two reviewers. Submission criteria were either 'accept with no changes' of 'reject'. In cases where the two reviews conflicted or in cases where only one review was available, the organisation committee made a decision on acceptation or rejection. In total 16 full papers were submitted, 15 were accepted for publication.

The 15 papers in these proceedings are linked to 7 different RDC's (4 from Education for Social Justice, Equity and Diversion, 2 from Professional Development of Teacher Education, 2 from Science and Mathematics Education, 2 from Teacher Education and Digital Technology, 2 from Primary and Pre-Primary Education, 1 from Inclusion and Special Needs and 1 from Technical and Vocational Education).

The papers also are covering the three subthemes of the conference, namely innovation (8 papers), professional roles of teacher educators (4 papers) and school-based teacher education (3 papers).

The authors of the papers come from different countries (United Kingdom, Norway, Finland, Australia, Portugal, Spain, Italy, Czech Republic, Romania, Japan, China, Ireland, Belgium, The Netherlands), so also the international view on teacher educational issues is guaranteed.

On behalf of the reviewing committee and the editors, we would like to stress that all accepted papers are published textually unchanged: the editors do not take responsibility for any (spelling, grammatical, content related etc.) errors which may remain in the papers received from the authors.

**Reviewing committee**
We would like to thank the reviewers for their work:

Anouke Bakx
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Quinta Kools
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**Organizing committee:**
Quinta Kools, Bob Koster, Anouke Bakx, Paul Hennissen, *Fontys University of Applied Sciences*

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Leids Congres Bureau

# Technical and Vocational Teacher Education (TVTE)

# Collaborative Curriculum Development and Meanings given to it by Teachers

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**Abstract**
This study deals with competence-based curriculum development in higher education, in universities of applied sciences. Competence-based curricula have been launched with the Bologna process into European higher education over the last two decades, introducing student-centered curricula instead of earlier subject- centered curricula.
The present curriculum development started with the idea of collaboration to strengthen the teachers' agency. The administrative view was to implement the competence-based curriculum and new assessment criteria and to ensure their implementations. My idea as a responsive planner and head of the project was to offer a forum for interaction.
The theoretical frame of this study was constructed on the basis of curriculum theory and the change of paradigm within it. The aim of the study was to find out how teachers talk about curriculum and curriculum development. Much effort was given to the interpretation of their words and utterances. The research questions specified the aim of explaining what meanings were constructed and how they were understood as part of the interaction process.

The research questions were:

1. What meanings do teachers in an applied sciences university give to competence-based curriculum during the development process?
2. How are the meanings constructed in the development process of competence-based curriculum?

The research method was discourse analysis. The context of the study was the department of engineering in Oulu University of Applied Sciences. The participants were 15 teachers working as program leaders. The material consisted of six group discussions proceeding as a pedagogical process in 2009 - 2011. All meetings were recorded and transcribed.
Outcomes of the study consist of interpretation repertoires. Repertoires can be defined as situationally constructed varying ways to talk about curriculum development and curriculum.
Six interpretative repertoires for *curriculum development practises* were formed from the material. They were "coercion, duty, benefit, threat for the autonomy, initiative for reflection and toughening pedagogic leadership" –repertoires. They are linked to the themes of teachers' pedagogical practises and identity construction. The most dominant repertoire was coercion repertoire.
Seven interpretative repertoires were formed about the *curriculum itself*. They are repertoires of "formal learning, substance-centeredness, personal learning, knowledge-based, course-centeredness, student as an object and inconsistent relationship with the working life". Based on the results, future directions and targets of the applied sciences curriculum work are reflected in the article.

**Keywords:** competence-based, discourse analysis, higher education, interpretation, professional growth

## Introduction

Developing a competence-based curriculum in higher education is based on the aims of the Bologna process to promote the rise of European united labor market and the movement of work force. The harmonization of school systems and defined competences in the Union countries is the central medium in realizing the aim.
Meeting the needs of constantly changing competence requirements of work life has lately been an aim of vocational education at both secondary and tertiary levels. Competence-based curriculum

refers generally to a curriculum which describes the learning targets as the competences and skills needed in work life. Competence-based knowledge and skills are strongly linked to the idea of learning and gaining competences in ways that are independent of time, place and the way of learning. It emphasizes the recognition of non-formal and informal learning.
The competence areas were described for the degree programs of universities of applied sciences in 2004–2006. Thereafter the applied sciences universities continued editing their curricula to make them competence-based. Today online pedagogy is being developed, as is the digitalization of teaching, but are the basic ideas of competence-based learning clear? Can universities of applied sciences recognize and accept students´ knowledge and skills gained in different ways and in different environments? Are students offered chances for individual learning paths and checking points that support professional growth along the learning path?
In my article I will present the meanings concerning the concept of curriculum produced during the process of developing a competence-based curriculum in the technical department of Oulu University of Applied Sciences (OUAS) in 2009-2011. At the time of this research my task was to develop a competence-based curriculum. My role was that of a researcher developing and studying her own work.

**About the Curriculum Development**
The curriculum at its widest can be seen as a symbolic struggle tied to a certain time and place, a struggle in which generations define themselves and their worlds (Pinar et al. 1995, 847–848). It is a presentation of the values of the curriculum authors, of their aims in education and of what and how the learners should learn. The vocational education curriculum can be seen to represent, either explicitly or implicitly, the value basis of the trade or profession in question, in other words what kind of professional is considered a valuable target of education. The curriculum always asks who or which party has the right to define what will be taught in educational institutions. At its narrowest the curriculum is a list of course descriptions, of the knowledge that must be conveyed to the students.
In curriculum research, as in humanities in general, there has been a change of paradigm from 1970–1990. A subject-centered curriculum has got another, parallel curriculum-thinking with individual life paths, stressing postmodern people´s need and right to build their identities through competences and individualization of knowledge. The curriculum has become a negotiation of all parties concerned. (Goodson 2009, 71–72.) A central view in observing curriculum research is the relationship between the teacher and curriculum. The research emerging out of understanding and interpretative curriculum theory observes critically goal-and efficiency- oriented curricula built on the basis of behavioristic learning theories. The critique of goal-oriented curriculum has especially concerned the way of seeing the teacher as a technical executor of the curriculum with no chance of setting goals and developing the curriculum. (Doll 1993; Grundy 1987). The central aim of the understanding and interpretative curriculum theory has been to give a teacher a voice as a developer of the curriculum and a producer of the knowledge concerning it. (Lauriala 2013, 758–580).
The concept of competence based knowledge came to universities of applied sciences along with the national ECTS project in the 2000´s. It was introduced according to the framework of European degrees (EQF) as a competence model connecting knowledge, skills and work life competences. A central aim was to pay attention to a new way of expressing the goals of learning through describing what the student will be able to do, not telling through a list given to a teacher what to deal with in the lessons, as it was done in subject-oriented curricula (Auvinen et al. 2007, 51). At the same time attention was paid to changing the pedagogy to support students´ learning and skills development as well as to recognize and accept competences.
Competence-based teaching has been seen as a positive, student-centered principle, but it has been criticized for emphasizing the student´s competence as visible and assessable practical action which happens to create a connection to goal-oriented behavioristic curriculum. Young (2013, 107–108) and Wheelahan (2015, 750) criticize the modern, western, competence-based curriculum in vocational education for focusing on the skills at the expense of knowledge. This is how, according to them, competence-based education unintentionally isolates part of students from critical knowledge and

renews inequality, although the explicit aim is to promote inclusion and participation in the labor market. Mäkinen and Annala (2012, 132) remark that competence-based education has not been analyzed through research and that its paradigmatic connections have remained implicit.

**Research Material and Method**

The research material consists of the discussions recorded during the development process of competence-based curriculum in 2009-2011. The reform was implemented with employees responsible for curriculum work in the field of technology where the data were collected. After the induction the participants were to deploy the reform to the teachers of their responsibility areas. Seven sessions were arranged, of which six were recorded and transcribed. There were 15 participants altogether, participation varying at different times between 7 and 13.

I was the leader of induction sessions. The sessions had been planned to be interactive and dialogical occasions. The participants were allowed to ask, reflect aloud and discuss together as much as they wanted. Curriculum development was approached through shared negotiation of meanings and wide participation.

My background assumption was that listening to the teachers´ voices and understanding them as co-developers is valuable in order to get genuine feedback about the reform. My point of interest was to explain the experiences and conceptions of people responsible for degree programs on competence-based curriculum development.

The research method is discourse analysis based on social constructionism. It was evaluated to be an appropriate way to analyze group discussions and the shared meanings constructed in them in spite of the challenges of the method. In induction education certain reforms were brought ”from top to bottom” to be included in the curriculum and carried out in practice, but my purpose was to connect practical, situational knowledge to administrative text through which it would be possible to get high quality knowledge combining theory and practice.

The research questions were:

1. What meanings do teachers in an applied sciences university give to competence-based curriculum during the development process?
2. How are the meanings constructed in the development process of competence-based curriculum?

Discourse analysis is a wide methodological reference frame. Discourses can be defined as well-established practices of speech which partly build and produce the phenomenon that they describe. Discourse analysis studies how discourses are constructed in social practices and in the texts produced in interactive contexts. (Phillips and Hardy 2002, 3–4.) The relationship between the researcher and the target is seen as constructive in discourse-analytic research. The researcher both describes social reality and creates it. (Parker 1992, 10–11.)

I will present the outcomes of the analysis through interpretation repertoires. The concept of interpretation repertoire is according to Silverman (2014, 321) applicable to studies which analyze the variation of everyday language use in a detailed way. According to Potter and Wetherell (1987, 149) the repertoires are built, for instance, by talking of the same phenomenon or matter in various ways. Those ways can differ from each other in their linguistic styles, grammars and vocabularies. People can often, when talking of a certain thing, use alternately different repertoires, so that the speaker´s attitude is difficult to categorize.

**Outcomes**

The research data offered along with the analysis consisted of two wide themes. The first dealt with the positioning of the participants in the development of competence-based curriculum, and it was named the discourse of curriculum development. The second theme dealt with the meanings given by the participants of induction education to learning, teaching practices, curriculum, competence, learner and work life collaboration. It was named the discourse of curriculum.

The results will be presented as interpretation repertoires. They are seen in this research as different situationally constructed ways to speak of curriculum development and of the curriculum itself which simultaneously edit the discourses concerning them. (Wetherell and Potter 1992, 102.) The data yielded six different interpretation repertoires of curriculum development during the analysis. They were named *coercion, duty, benefit, threat for the autonomy, initiative for reflection and strengthening pedagogic leadership* –repertoires. The most dominant of them was coercion repertoire.
In analyzing various ways to speak of curriculum itself, seven repertoires of interpretation were formed. They were named *formal learning, personal learning, knowledge-based, substance-centeredness, course-centeredness, student as an object and inconsistent relationship with the working life*.
Next I will describe the contents of the interpretation repertoires. The quotations illustrating the descriptions are taken from the raw data covering wider discussions.

***The Repertoires in Curriculum Development***
**In the coercion repertoire** curriculum development appears as a "from top to bottom process. From the viewpoint of induction education participants, the decision of launching a competence-based curriculum had been made somewhere far from the reality of practice.
*"…we act according to this Bologna process and European framework…."*
The coercion repertoire was formed out of many meanings given to curriculum development interactively, describing various shades of difference, meaningfulness and detachment from reality.
*"…the big ideas don´t always act in great masses, I think. "*
*The coercion repertoire* reflects a tolerant way of positioning (Kukkonen 2011) when the curriculum is experienced as a tool of outward direction. The Bologna process becomes meaningful as institutional power using, harmonization seeking state apparatus.
The teacher identity built in this repertoire appears as a technical implementer of teaching, although public speeches concerning applied sciences university emphasize teacher autonomy as the developer of the curriculum. Coercion repertoire reflects the postmodern paradox observed by Goodson (1998, 18) in which teacher autonomy is stressed and efforts are made to increase it on one hand, but simultaneously there is an opposite trend trying to narrow the teacher´s work and make it technical.
**The duty repertoire** tells of the attitude toward curriculum development as a work duty, as long as easy ways and solutions are allowed to be found on how to adapt the demands of the administration to reality and practices.
*"…That we would perhaps aim at average performance, so in that way …"*
The contribution to the development is small without innovativeness. Building curriculum as a duty is reflected in the study of Annala and Mäkinen (2011) in a positioning in which the work is realized evasively, but following the orders. Passivity and reactivity do not build autonomous teacher identity developing his/ her work, but rather technical and executive teachers.
**The benefit repertoire** describes a more positive attitude towards curriculum development which arose when the participants discussed about the views of curriculum development as benefiting practical work and collaboration. The starting point of building positive views was the questions of the needs and advantages of the development to their community.
*"…That there was need for development which should now appear useful to the students as well, in which the review might be useful for us too."*
The benefit repertoire builds a picture of teachers as reflectors and developers of their work when the need to develop arises from teachers´ practical experiences.
**Threat for autonomy -repertoire** brought up the question of teacher autonomy in designing and implementing the curriculum. The discussions dealt with the worry of too tightly binding the nature of the new curriculum.
*"…Will the teacher have any chances to change any longer, if they notice that this group needs some other kind of teaching …"*
Participants wanted to develop the curriculum in a flexible direction. It did not, however, mean the openness and flexibility of goals, student participation or situational flexibility, but it was connected to

teacher autonomy to direct the contents and methods according to the student group or chosen emphasis.

**Initiative for reflection -repertoire** was built when participants questioned their thinking and reflected on it together. This repertoire stresses, as the benefit repertoire, the reflection of one´s work as well as researching and reforming it as characteristics of being a teacher.

*"Does it depend on oneself if talking about entrepreneurship is limited like this, when do you observe it critically?*"

The repertoire includes elements of transformative learning (Mezirow 2012, 76), critical examination of one´s beliefs and making the feelings of inconvenience and difficulty explicit in front of new things.

**Strengthening pedagogic leaders -repertoire** brings up the need for pedagogical leadership in curriculum development. The roles of participants as pedagogical leaders was sooner seen as equal collaboration with other teachers. The identity of pedagogical leadership that was built by the participants is conversational and dialogical in relation to other teachers of the degree program. Instead, pedagogical leadership as directive, showing ownership of the curriculum was rejected. Collegiality was extended to teachers, but the participation of students was not included in the pedagogical leadership that was built.

***The Repertoires of Curriculum itself***

**Formal learning -repertoire** consists of discussions of where and how learning can take place and competence be gained, as well as, how competence can be recognized. It includes the conception of learning as individual, alone event. The conception of socially shared learning was not produced.

*"And the exam must be done individually, so that in the exam situation they solve the problems without help, otherwise it is a question of deceit."*

In different learning environments and in different ways, acquired competence was strange for them to recognize and accept. The stress was in learning inside one´s own school. Compulsory attendance and exam as evaluation methods were brought up as the means to control the students.

*"They are just compulsory, like some laboratory exercises. You have to be present, if you are not, you will not be passed. In the same way I have these lab exercises … everybody has to attend every lesson, which is the principle. If you are absent, you can do that thing next year."*

The roles of a teacher and student were produced in the formal learning repertoire as positions of a traditional speaker and listener. The repertoire reveals more the teaching-oriented than competence-based knowledge.

**Knowledge-based repertoire** brings up different interpretations of the relationship between theory and practice. The repertoire regards the knowledge base as the most important in the curriculum.

*"…it is the professional knowledge base that is over ninety percent, or like that, and the others are like extra spices …"*

Theory and practice are produced as phenomena separate from each other or successive when they can be taught in different courses. The traditional theory - practice relationship which stresses separateness and succession conflicts evidently with the pragmatic epistemological background of the pedagogy in applied sciences universities (Taatila and Raij 2012).

**Personal learning –repertoire** was built through the critical reflection on designing the learning goals. It constructs the curriculum in the framework of andragogy and postmodernism as the lifelong travelling of personal identity.

*"…But I think I am disturbed by the fact that we start from the idea that we all have the same starting and closing point, because I think it is ideal that everything proceeds in their own way. I think the learning occasion at its best is such as everybody starts at their own level and in reality everybody has their own starting points."*

The personal learning repertoire was built only in one speech section, and its occurrence was suppressed as incompatible with goal-oriented Bloom´s taxonomy (Anderson and Krathwol 2001) in the induction education.

**Substance-centeredness -repertoire** tells of the artificiality and difficulty of integrating generic competences to the curriculum. The difficulty experienced can be connected to the course and

knowledge based curriculum conception brought up in this repertoire, which equals competence and knowledge and excludes other dimensions.
*"You can get the highest scores without actually being able to do anything, thus in our system. It only measures knowledge base. "*
Substance-oriented identity stressing field specific knowledge is common especially in the higher education of technology (Korhonen et al. 2012, 137–141). Conversely, pedagogical identity is in a weaker position. It would give readiness to cross over the borders of disciplines and rise over them to examine learning and learning processes as general phenomena of learning, growth and development.
**Course-centeredness -repertoire** came out in a discussion which concerned the use of the new evaluation criteria of the OUAS. The discussion ended up with a simple and technically easy solution, when the result may be a curriculum including narrow courses and the knowledge base is taught in one course and application in another.
*"So that it is a suitable unit and placed at some of these levels and does not spread around."*
Understanding the curriculum and learning as reflective interaction of theory and practice may remain without attention in cases like this. The student´s experience of a curriculum that is tightly course-based can stay fragmented, when the curriculum does not make the development of competence and the path of professional growth visible and does not offer starting points for designing individual learning plans.
**Student as an object -repertoire** was formed out of the way to speak about students. Student speech was pessimistic and deterministic: all students are not able to learn all the contents in the examination. The student was seen as passive, irresponsible, uncommitted, non-sovereign person who excludes him/herself from the discussion concerning their learning.
*"…it is indeed questionable if students study the curriculum, although they are made for the students."*
The student was not described as an autonomous actor and peer in student-centered constructivist framework. Increasing student-centeredness was the central aim of competence-based curriculum in this respect the public speeches and practice conflict.
In **Inconsistent relationship with working life –repertoire** the applied university teacher´s work life relationship seems reactive, watching the changes and development of work life from the sidelines, trying to observe the changes of curriculum or even rejecting work life collaboration and concentrating on teaching. Work life appears as ever-changing and producing even hectic needs of irrational changes.
*"…if substance knowledge lacked, these leaders would be perplexed, but they only want everything."*
Work life –orientedness is a central starting point of applied sciences university, but reciprocal developing companionship did not come out in the discussion. The starting point of teachers in observing their work may still be teaching, as Mäki (2012, 91) supposes. This deviates from the views of the public goals of applied sciences university, to which discrepancy the name of the repertoire refers.

***A Summary of the Outcomes***

The aim of the development process of competence-based curriculum in the research context was to promote the competence-based character of the curriculum and add to student-orientedness. Emphasizing the coercion–repertoire tells that the curriculum development was seen as a "from top to bottom" process. The emergence of formal learning repertoire as the result of the research reveals that the development project could not promote the interpretations of competence and competence-based curriculum deeper than its knowledge-based character. Due to the induction education and its basis on Bloom´s taxonomy with the descriptions of knowledge levels, the work was focused on cognitive aims of competence. The EQF competence model integrating knowledge, skills and work life competences was difficult to connect to the model of substance-centered and knowledge-based curriculum.
The outcomes give reason to think that curriculum thinking has not changed constructivist when moving from secondary to tertiary level, although the vocational education reform took place twenty years ago. Competence-based pedagogy seems to be only in the beginning in the research context. It also appears that the idea of recognizing and accepting earlier acquired competence is not familiar.

Understanding that learning is ubiquitous including the idea of learning all the time, in different ways and environments does not belong to a formal curriculum.
Applying Bloom´s taxonomy to formulating sub targets may have influenced the results of the research. If the induction education had been based on a different approach, the outcomes would probably have been different as well. When evaluating the results, we have to remember that in qualitative research the results are the researcher´s interpretations. My resources of interpretation are based on the framework of constructivist paradigm which I have adopted through my education and profession, while the participants represented technical-scientific fields. When doing the research, I was a longtime member of that work community, which may, independent of different backgrounds, improve the validity of the interpretations.

**Discussion**
The results offer an opportunity to reflect on the future directions and targets of the applied sciences curriculum work.
A teacher´s role as an active and autonomous developer of curriculum has been much stressed in earlier studies. The starting point of curriculum development in applied sciences university should be the participation of all teachers in curriculum development without separating developers and teachers. It would be important to strengthen all teachers´ reflective and investigating attitude to their work.
The best starting point is that the need for development emerges from teachers´ practical experiences and critical observations, which will lead to detect the targets of development. Developing curricula should be seen as a shared project whose promotion includes opportunity to negotiate different meanings and interpretations, not implementing them “from top to bottom” with outside completed wordings. These views are stressed also by Mäki and Saranpää (2012).
The conception of competence would need a lot of deepening so that the curriculum would be built from the beginning on competence-based model and would be taken to pedagogical practices. The curriculum is not competence-based, if the aims have been translated to the languages of competences, but action goes on as teacher-oriented and stresses formal learning.
Individual learning and professional growth should be raised to the center of the curriculum in the applied sciences university. It would make teachers and students see the curriculum primarily as an explicit and conscious description of the possibility towards professional growth. It also creates a basis of understanding formal and non-formal learning. The change is necessary in order to move from teaching-based to competence-based curricula.
In interpreting competence-based plans it is important to cut loose from the view which sees competence as single and unattached tasks according to minimum requirements (Haltia 2011, 61) and to make efforts to confirm that it also includes high quality, multi-dimensional expertise (Mäkinen and Annala 2012, 138). It is connected to personal learning: the question is, whether learning a trade is seen as passing the minimum standards equal to all or as a lifelong individual path of professional growth built from everybody´s individual starting points.
The starting point of a curriculum must be besides personal learning also work life –orientation which is seen as dynamic and partnership-based future-oriented collaboration (Annala and Mäkinen 2011, 16). The curriculum should be changed communal, to make the aims of competence concern all learning community – student, employees and teachers who develop the action together.
The student as an object –repertoire reveals how important it is to question the conception according to which students would not be capable of participating as fully authorized actors in planning their learning. The students should be offered an opportunity of gradually deepening participation in their learning communities. The participation will proceed from offering supporting ladder to integration into expert culture and building professional identity (Kukkonen 2012, 166). The curriculum should be continually open for students´ questions and notions. Discussion of curriculum should be continuous at different levels so that even the beginning students would be socialized in discussing culture and were encouraged to participate in it. The question is of teachers´ and students´ shared reflective dialogue and developing the curriculum.

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# Primary and Pre-primary Education

# The Impact of the Curricular Reform on the Activity of Primary School Teachers and the Role of Teacher Education in the Future

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**Abstract**
The new reform in Romania in education enrolls the six-year old children in primary school, in the preparatory class, and the new curriculum for the primary school involves a new pedagogical vision: it is based on developing competences (instead of objectives) there are changes of contents, new textbooks, digital textbooks etc. Teachers have to change and adapt their work to all these new things and we think that this entails a lot of study and even alters theirs previous beliefs. At the same time the reform is a challenge for universities, which have to prepare the primary school teachers for lifelong learning. The basic *questions* of this study are: "How difficult is it for teachers to adjust their work and to implement the new curriculum?" and "What are the tasks of teacher education so as to produce well-prepared teachers for the future?" This study has used a *mixed-method design* as the procedure for collecting, analyzing, and combining both quantitative and qualitative data. To detect the personal impact of the new curriculum on the teachers we applied a questionnaire and conducted interviews. The target population of the study consisted of 29 teachers from two schools: one from the center of the city and another from a village. The *findings* indicated no great differences between the two schools regarding the teachers' perception of the new curriculum. They stressed the considerable amount of work necessary to study, understand and apply the new requirements, but some of them reported better results obtained with the new curriculum. To avoid this kind of problems for the teachers in the future, we have to change the teacher education policy. We consider the recommendations to reform teacher education in the context of lifelong learning useful (Dolan, 2012). *Discussion*: Is it possible to apply these principles to our university? Which are the difficulties and barriers and how can we overcome them? What is the experience of other universities in this domain?

**Keywords:** curricular reform, lifelong learning, primary school teacher education

## Context of the Research

After the 1989 Romanian revolution, the education were reformed several times, starting with immediate measures to demolish the communist policy of the system, then rebuilding the system, pursued by comprehensive reform, new laws and a lot of Ministry orders. The laws of national education from 1995 and 2011 were milestones of the process of reforming the education in Romania. As part of a larger pedagogical reform, curriculum reform could be considered one of the most important components, even the key tool of the educational reform.

The last important reform for primary school started in 2012, by structural changes: the six-year old children were enrolled in primary school, in so-called preparatory class. The new curriculum provides a new philosophy: the integrate methodology of teaching, it is built on acquirement of competences instead of objectives, involves a new technology to plan the activities, comprises new textbooks accompanied by CD-s, new subjects to teach, changes of contents.

The agents of the changes are the primary school teachers who have to implement all the reform provisions. They must modify and adapt their work to all these new things and we suppose that this entails a lot of study, a lot of work and even alters their previous beliefs.

The aim of the primary school curriculum is to prepare the child for further education and lifelong learning. The curriculum places a strong emphasis on lifelong learning skills such as developing the ability to question, to analyze, to investigate, to think critically, to solve problems, to interact effectively with others, to be able to learn through the use of ICT. Lifelong learning features are part of the curriculum for the primary school, what implies changes in primary teacher education. The

reform has been accompanied by parallel initiative to reorganize and improve initial teacher training. It must be a priority to introduce the principles of lifelong learning in teacher education.
After almost four years of reform, the study aims to establish if the primary school teachers are prepared for the change, if they are ready to learn and apply new things, and they are willing to reflect on their work for better results. On the other hand, we try to find the way to improve the initial teacher education.

**Research Questions**
The basic questions of this study are:
"How difficult is it for the teachers to adjust their work and to implement the new curriculum?"
and
"What are the tasks of teacher education so as to produce well prepared teachers for the future?".

**Theoretical Framework**
A reform of education means a profound change in structure, curriculum, and finalities of the educational system based on a philosophical and pedagogical project. It can be defined as "an educational innovation projected long-term which aims the intentional and profound transformation of the social product of the process of education which fits of finalities determined according to the level of education policy" (Eurydice, 1996); or "a major change deliberate, which targeting the transition from a present state to a projected state that triggers changes in depth" (Champy, 2005); "a redesign of education which refers to the structure system innovations and which occurs at hierarchical relationships between the levels of education, in opening the school to society" (Vlasceanu, 2008).
After the change of political power, in 1989, an educational reform in Romania was an inevitable process. As a characteristic of all Eastern European countries orientation, the search for a new system of education has taken two main directions: the first is directed toward the past, to their educational history, and the other looks towards experience abroad (Anweiller, 1992). In Romania there was a pronounced tendency to look back positively to the system that existed before, but, in the same time, to correspond to the new modern needs in a democratic society, looking abroad to adopt some solutions which would fit the new realities.
The first five years after 1989's revolution are characterized by delaying or blocking education reform (Nicu, 2016) and "the analyses on innovations in education show that until 1997 they were less relevant (Chis, 1998).
In the developing reform process, there were many ardent debates which have dealt with: the length of compulsory schooling; the lower level of high school education; the final school examination; the reduction of the overload of syllabuses; the revision of instructional methods; teaching in the mother tongue of national minorities; foreign language teaching; education funding; private education; the educational role of religion and so on (Stoian Connor, 2003).
The educational reform process in Romania before EU accession comprises four stages (Birzea, 1996; Butuca et al., 2001): de-structuring (1990); stabilization (1991-1992); restructuring (1993-1995) and comprehensive educational reform (1996 – onwards).
The first stage, *de-structuring* (1990) occurred in the middle of 1989/1990 school year. It was time of denying the old education system and an immediate correction of the major characteristics of communist education. A goal was shifting from quantity to quality, from the polytechnic education to the universal education in the humanistic and social sciences. The program of foreign languages study was intensified.
The second stage, *stabilization* (1991-1992) is characterized by the definition of a legal framework for re-establishing the education system. An important step was the promulgation of the new Constitution of Romania in December 1991. The educational policies had to "strengthen earlier decisions and set the educational system on a firm foundation" (Birzea, 1996).
In the third stage, *restructuring* (1993-1995) Romania had the opportunity to move closer to the European Union structures concerning the improvement of new quality standards in education. A new

educational program had to pursue four major objectives: formulating a new education policy; mobilizing foreign co-financing educational reform; changing the legal framework; and restructuring the educational system (Birzea, 1996).

The most important documents were adopted in 1993: "The White Paper on Education in Romania" and "Higher Education Reform in Romania". According to these documents, Romanian education must adjust its objectives in order to answer to the economic and social changes. The main directions and priorities of the educational reform are as follows: decentralization, reorganizing teacher training, curricular reform and the European compatibility of the national curriculum, alternative textbooks, reforming vocational education, reforming higher education and university scientific research and international cooperation (www.edu.ro/cartealb.htm).

The restructuring process had the financial support of the World Bank and UE-PHARE. These programs established the following objectives: new curriculum development, teacher training, alternative textbooks, examination system reform, educational management reform, school infrastructure, professional career counseling, and defining new occupational standards.

The 1995 Law of Education, as an organic law, is the first post-communist educational law in Romania which "regulates the organization and functioning of the national system of education" (www.edu.ro/leginv.htm). This act promotes the democratic education principles and guarantees the right for a differentiate education.

The fourth stage, *comprehensive educational reform* started at the end of 1996 and it was an acceleration of the already initiated reforms. A comprehensive plan of reform for education was conceived in 1997 as a consecutive set of six chapters of objectives (Marga, 1999):

1. decentralization of the system through consolidation of the institutional autonomy of the educational units and reformation of school and academic management;
2. educational contents reform (educational framework-plans, national curriculum, textbooks) and achievement of international compatibility in regard to the national curriculum;
3. establishment of a new relationship between educational institutions, at all levels, and between educational institution and the local authorities;
4. improvement of the school infrastructure and re-launching of rural education through a foreign loan;
5. moving forward through the resumption of the scientific research in universities, changing the character of education (from reproductive learning to problem solving), and connection to the contemporary worldwide electronic communication net;
6. advanced forms of international cooperation.

This period was important for some new institutional and legislative reforms, recognized as "major steps" of reform by the Organization for Economic Cooperation and Development (OECD) and European Union Reports of 1998 and 1999 (www.edu.ro/reformeducation.htm).

Concerning the primary school teacher education, in 1999-2000, according to Order 4758/1998 of the Romanian Ministry of Education, were founded the pedagogical colleges, affiliated to universities, which existed in parallel with the vocational pedagogic high schools. After Bologna, the colleges were transformed in bachelor level, as higher education, as faculties of pedagogy for primary school and kindergarten teachers.

**Curricular Reform**

One of the major comprehensive reform actions can be considered the curricular reform. Due to the fact that "syllabi must keep abreast of the evolution of knowledge", they are "the instruments through which the traditional, universally acknowledged goals of education are attained" (Kallen, 1996). Therefore, the new National Curriculum for the pre-university education could be considered as a "key piece" of the educational reform (Stoian Connor, 2003).

The process of elaboration of the National Curriculum had three fundamental points of reference: (1) the reference to the present dynamics and necessities, as well as the long-term finalities of the Romanian education system; (2) the reference to the present tendencies and generally accepted

international criteria regarding the curricular reform; and (3) the reference to the point of view of the reform process (www.edu.ro/cartealb.htm).
Starting with the 1998-1999 school year, the National Curriculum comprises the following elements (Novak et al, 1998):
• National Curriculum for compulsory education. Reference framework: insures the coherence of the curricular system components;
• Educational framework-plans for the 1st-12th/13th grades: establish the curricular areas, the subjects of study, and time resources for each;
• Syllabuses: establish the framework and reference objectives, learning activities' examples, learning contents, and the performance curricular standards for each discipline included into the educational framework plans;
• Guides, methodological norms, and support materials which describe the enforcement and monitoring conditions of the curricular process;
• Alternative textbooks.
The National Curriculum from 1998 guided the Romanian education until 2012, when a new wave of reforms comprised the education system.
The Law of National Education no. 1/2011 was a milestone for the evolution of the system in the next years. It had a lot of important involvement in all the levels of the education in Romania, but we shall focus on the primary school.
The article no. 23 (1) provides a structural reform of the educational system: the six-year old children are enrolled in primary school, in the so-called "preparatory class".
In the curriculum section, art. 68 (1) defines the eight domains of key-competences which determine the formation profile of the pupil: communication competences in Romanian language and in the mother tongue, in the case of national minorities; communication competences in foreign languages; basic competences in mathematics, sciences and technology; digital competences to use the information technology as a tool for learning and cognition; social and civic competences; cultural competences; the competence to learn how to learn.
The same article 68 (4) defines the Curriculum for the preparatory class, which pursues the physical development, socio-emotional, cognitive, the development of the language and communication, and the development of the capacities and attitudes of learning, ensuring the links with the key-competences (Manolescu et al., 2012). The Annex no. 6 at OMECTS no. 3654/2012 defines the elementary level of performance in the key-competences formation.
The same order establishes the educational framework-plans for the preparatory class and the 1st and 2nd grades which reflect the same competence domains. A new subject appears: mathematics and environment exploration instead of mathematics separated by the environment cognition.
In the same period, new syllabuses were drawn for all study subjects. They are designed using a new philosophy, based on competences instead of objectives, general competences defined for a longer period and specific competences stipulated for a school year.
The didactic conception is itself different: it imposes an integrate teaching in an interdisciplinary way. The teacher has to plan the activities in a new conception: he has to provide some generic themes and to frame all the topics into them.
This reform was applied gradually, starting in 2012 with preparatory class and this year (2016) will be applied at the 4th grade, the last class of the primary school.
Unfortunately, the first generation had not textbooks written according to the new syllabuses, but, in time, this problem was solved.
This reform, like the precedents, was propagated from top to bottom, so, the teachers are the most exposed, they have to adapt their working style to all these new things.

**Research Methodology**
This study has used a mixed-method design as the procedure for collecting, analyzing, and combining both quantitative and qualitative data. It was developed during the first semester of the 2015/1016 school year.

To detect the personal impact of the curriculum on the teachers we applied a questionnaire and conducted interviews.
The target population of the study consists of 29 primary school teachers from two schools: one from the center of the city (Scoala Nicolae Iorga, Sibiu) and another from a village (Scoala Rasinari, jud. Sibiu). Only 16 teachers from the first school and 8 teachers from the second experienced the application of the new curriculum in the classroom, so the questionnaire and the interviews were done only with them.
The questionnaire included six items. The first item asked to specify the classes taught pursuing the new curriculum, the second item asked the total number of years of experience in teaching. The third focused on the time allocated as individual study for the new curriculum, textbooks, and the new methodology to project the activity. The next item asked about the support received by teachers to implement the new curriculum from: the County School Inspectorate, the school management, the colleagues, on a scale from very useful, useful, slightly useful, to useless. The fifth item was about the need of training: if the teacher considers useful some training sessions or workshops on this subject. The sixth item refers to the necessity of new learning resources.
The interview focused on two problems. The first was a discussion about the results of the pupils compared to the precedent classes. The second subject asked a personal opinion on the impact of the new curriculum on the teaching activity.

**Findings**
The findings indicated no great differences between the schools regarding the teachers' perception of the new curriculum, so we aggregated the data from the groups and the results of the questionnaire are expressed as percentages.
The answers of the first item indicate the experience in applying the new curriculum. This experience can influence the other answers of the questionnaire and the opinions expressed during the interview are more documented in the case of a large experience. From the questioned teachers, 41,66% taught only 1 year using the new curriculum; 33,33% 2 years; 8,33% 3 years and 16,66% all 4 years.
The second item indicated the didactic experience: 25% are under 10 years of working in education; 16,66% between 10-20 years; 41,66% between 20-30 years (the majority) and 16,66% more than 30 years of teaching in primary school.
The third question regarding the amount of time allocated for the individual study of the new curriculum, new textbooks, and new demands concerning the planning of the activity received different answers, from one week to one month, but the majority stipulated that it is a continuous activity. Analyzing the data on vertical, we can observe that the time allocated for the individual study of the curriculum is in inverse variation with the number of years of teaching: the teachers under 10 years of experience needed more time to investigate the new provisions.
The fourth item, regarding the support received by the primary school teachers in implementing the new curriculum received good answers. The County School Inspectorate organized a training session on this subject with the teachers, but some of them accused the big amount of information received in a very short time (3 days). However, 8,33% of teachers considered this support very useful; 66,66% useful; 25% slightly useful. One of the teachers is a trainer in this program and she did not answer to all the questions. The support provided by the school management was appreciated as follows: 41,66% very useful; 37,50% useful; 8,33% slightly useful and 8,33% useless. The majority stresses the colleagues support as very useful: 66,66% and useful: 29,16%.
About the need of training sessions or workshops on this subject (the fifth item) the opinions are diverse: 58,33% are for training sessions; 41,66% do not need courses. 75% are interested in workshops participation; 25% are not interested in workshops. The opinions about the training needs are not in relation with the number of years of teaching or reform experience.
The reform brought six-year old children in primary school, so, the furniture had to be adapted. For this purpose, the preparatory classes were endowed according to the Ministry of Education orders, in a specific way. However, 83,33% of the teachers answered to the sixth item that more material resources would be necessary; and only 16,66% consider it satisfactory. Some teachers detailed the

needs in this direction, not only material resources, very often made by them, but they feel the lack of more documentation, more auxiliary textbooks and so on.
The interview focused first on the teachers' opinion concerning the results of pupils in the new curriculum conditions. They had to reflect and to compare the period before the last reform and the actual period. Some of them made no comparison, especially the youngest. The majority recognized the efficiency of the changes and the positive influence of the presence of preparatory class in primary school.
The personal opinions regarding the influence of the new curriculum on didactic activity were diverse. Some teachers (with a lot of years of experience) said that they accommodated easily, they did not feel the reform like a burden. Others stressed the overloading of the new syllabuses, especially the mathematics and environment exploration. They experienced this syllabus for the 2nd and the 3rd grade and it was very difficult to cover it, without time for reflection and revision. Another difficulty for the teachers was the new style to project the class activity, where "you need a lot of creativity and imagination", as they said in the interview. Others considered it a real "pressure". The teachers claimed the bad quality of the textbooks and even the lack of them for the first reform generation. The CD-s accompanying the textbooks can not be used without the specific technique, which is missing from a lot of schools and houses.
Some of the teachers recognized the advantages of the curricular reform: "It responds to the need of labor market because ensures the preparation of the children for the social and professional life; the instruction is oriented towards final results; the pupils are involved in the learning activity and in the competences assessment; the teachers acquire planning competences based on the model centered on results. The teachers have to create practical learning situations implying actively the class, and the evaluation of the pupils is very complex" are some ideas expressed in interviews.
The primary school teachers interviewed stressed the considerable amount of work necessary to study, understand and apply the new requirements, but the majority reported better result obtained with the new curriculum. To avoid as possible this kind of problems for the teachers in the future, we have to change the teacher education policy.

**Implications for Teacher Education**

We consider useful the recommendations to reform teacher education in the context of lifelong learning formulated by Dolan (2012) and we try to answer to some questions: if it is possible to apply these principles to our university, which are the difficulties, the barriers and how can be overcome.
As the study proved, the initial teacher education is insufficient for the lifelong professional needs of teachers.
Lifelong learning is a concept which appears very frequently in educational policy in the last years. It has not a definition because it "is such a broad concept that is difficult to reach a clear, uncontested definition (Chapman and Aspin, 1997). It is based on three principles: "lifelong learning is life-long, life-wide and centered on learning, rather than on education and on educational institutions" (Schuetze and Casey, 2006); "lifelong learning embraces all learning, including that which takes place both formally and informally within organizations, universities and colleges of education" (Chapman and Aspin, 1997); "it has implications not only for adult education, but also for all those involved in primary education, for colleges of education, for universities, for all students, for teachers and, indeed for school children" (Dolan, 2012).
The European Commission's communication (2007) "Improving the quality of teacher education" presents an analysis of the challenges facing teacher education today and identifies key policy concerns to be addressed at national and EU levels. Lifelong learning for teachers is considered to be vital, involving quality programmes of initial teacher education, appropriate early-career support and relevant continuing professional development opportunities for teachers and school leaders – all of these programs should be informed by systematic academic research and extensive practical experience.

Educational theorists Day (1999) and Longworth and Davies (1996) highlight the importance of lifelong learning for those involved in primary education, due to the tremendous potential of teachers to positively nurture or negatively demolish a love of learning.
In "Reforming teacher education in the context of lifelong learning: the case of the BEd degree programme in Ireland", Anne Dolan (2012) suggests seven recommendations for all agencies involved in teacher education. We analyze the applicability of these principles to our primary school teacher education programme.

***Introduce lifelong learning as a compulsory component of the teacher education curriculum***
"Learning how to learn and learning across the lifespan must be more than mere slogans, they should be written into all teacher education programmes and their principles should inform curricula, content, context and pedagogical approaches of all teaching and learning opportunities" (Dolan, 2016). For the student teachers it is important to recognize that teacher education is only the first step on the continuum of teacher education. In our study, a teacher motivated that she is so easily adaptable to the changes of reform because she had a good preparation in the college of education. We have not a course dedicated to lifelong learning in this moment. The idea is very good, but it is not so easy to find specialists in this domain and it implies to change the programme. We consider it important and in the future we expect that the stakeholders will be convinced by the reality.

***Devise a curriculum for teacher educators***
Teacher educators should be well versed with the theory and philosophy of lifelong learning (Dolan, 2012). It is true that especially the teacher educators who's specialty is the methodology of different subjects in primary school are primary self-educated. They were trained through some courses; one of the most important was in the autumn of 2012, when the curriculum for the primary school was changed. Cochran-Smith (2003) argues for the need for a curriculum for educating teacher educators and for a discussion about what teacher educators need to know in order to prepare teachers for the twenty-first century. They need to be positive models in lifelong learning for the teacher students. In the same time, they have to use modern methods, and, in this area, our university organized courses with internal and external trainers.

***Incorporate teachers as active partners***
We have a strong relation with primary schools where our students are involved in practice. The primary school teachers are our partners in training student teachers to gain the teaching skills. The teachers share their expertise and experience systematically, by the practice programme. Of course, they have the experience of lifelong learning because they have to adapt the activity to all reforms which were implemented in the last 25 years.

***Promote the co-construction of knowledge***
The students entering initial teacher education in Romania are from the pedagogical high schools of from philological high schools in majority. They bring knowledge specific for teacher education or, on the other hand, they have no mathematical skills but they excel on humanistic sciences. The co-construction of knowledge can be achieved, in our opinion, in heterogeneous groups which work together, to help each-other, to complete the lack of knowledge useful for the primary school teachers.

***Reflective practice***
Reflective practice is an important aspect of teacher education in both theoretical and practical respects (Pollard et al., 2008). Reflective practice was applied in pedagogical high schools and it is applied now in teacher education in universities. The teacher students have to reflect about their lessons, to speak about and to stress the good parts and the parts where they could change something. If the teachers are accustomed to reflect about their work, they will do it in the future too, so it is a condition for the lifelong learning. But reflexivity takes place in a deeper level and incorporates reflections about the self, the event and the wider social context in which the event took place. To be

reflexive can actually nourish reflections as introspection leads to heightened awareness, personal development and improvement of self and of the practice of teacher education (Dolan, 2016). We suppose that our psychologists can help in this domain and incorporate the opportunities for reflectivity for students and teacher educators.

***Establish a broader role of the teacher education***

"Lifelong learning requires linkages and bridge-building so that citizens may benefit from smooth transitions in-and-out of the education and training systems, at all stages of their life span" (Coolahan, 2002).

"The teachers and the teaching profession seem to matter less and less in Romania, not only for students, parents, and young university graduates, but also for those who run education. Although teachers are the most important factor for development of human resources, the respect accorded to the teachers by politicians, society, family, students, and even self-esteem of most teachers, it is deteriorating steadily" (Nicu, 2016).

The teacher role in society has to be reconsidered and appreciate according to its importance for the future. Only when this profession will be valued, the role of the teacher education will increase. Even in our university, we can observe a marginalization of this sector in a department which is not independent and we try to make the stakeholders aware of its important role for years.

***Foster collaboration between partners***

Lifelong learning strategies can help promote the creation of a learning community based on the interactions between educational institutions and their host communities, that is, involving teachers, students, teacher educators, schools and higher education institutions (Nicholls, 2000). The teacher education institutions have to work with students in creating new lifelong learning models of teacher education. There is necessary more cross-collaboration between universities and schools, between teacher educators and teachers.

Our department organizes activities with participation of primary school teachers, pupils, student teachers, teacher educators, and County School Inspectorate's representatives together. This collaboration is very important and it is imperative to be augmented in the future.

In order to prepare teachers for the challenges posed by global and societal changes, initial teacher education programmes for primary teachers need to draw upon the theories and practices of lifelong learning in a fully informed manner.

**Conclusions**

The multitude of reforms in the educational system in Romania in the last 25 years affected especially the teachers, because they had to implement them and to change their habits of teaching, to learn more and more, to modify the planning methodology, to teach new contents, and to adapt themselves to the new generations of pupils.

We initiated this study in the idea that it was extremely difficult for primary school teachers to apply the provisions of the last reform which was really very comprehensive. The findings proved that the majority of teachers is well prepared for the changes, the big amount of work did not dishearten them, and they are looking with optimism to the results. We can affirm that the primary school teachers are lifelong learners.

A lot of the participant teachers in the study have graduated the pedagogical high schools and have a bachelor too in teacher education. This gives them a very good qualification and that is the reason to be so well prepared. In plus, they had the opportunity to participate to different courses organized before the last reform.

We can not be equally optimistic regarding our teacher students which are not graduated in a pedagogical high school. And, in the same time, we can not foresee what will happen in the future, along their didactic career.

The solution to have well prepared teachers for the future is to apply the lifelong learning principles in the teacher education. Some of these principles are available and handy to implement, but, to introduce a lifelong learning compulsory course seams difficult, but not impossible.
We think that now is the moment to take the important decisions to improve the teacher education in our university.

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# Why He Makes Positive Changes: A Tale of a Rural Teacher

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**Abstract**
China have more than 3 million rural teachers who works in the under-developed areas such as areas inhabited by minority nationalities, remote and poverty-stricken areas which have very limited educational resources. Despite of so many disadvantages, some rural teachers endeavor to reform and create more learning opportunities for their students. Teacher A is one of them. This study tries to explore the deep reasons about why teacher A makes positive changes from the lens of identity.
By using in-depth interviews, two-month participant observations as well as interviewing the important persons of the participant to know him more, the research tries to examine how the participant construct and reconstruct his teacher identity. Inspired by the current literatures, this research focused specifically on how the participant navigate and construct his teacher identity among the external and internal factors. The external factors include the macro and micro level ones while the internal factors include the cognitive, emotional and moral ones. Findings from this research confirm existing literature regarding teacher identity formation is an ongoing process of how to construct and reconstruct their meanings of "being a teacher". Furthermore, it provides particular understandings about the complexities of Chinese rural teachers' working and living lives. Their perseverance to make a difference are rooted in their educational history and living experiences. They have their inherent responsibilities to their pupils and communities, they are active to be part of the changing world.
The results suggest that in order to support and develop rural teachers, teacher identity should be regarded as the essential access to their professional life. Teacher identity is holistically embedded in multiple contexts. Chinese rural teachers' innovative teaching are derived from interactions with their pupils, fellow teachers, head teacher, and local communities.

**Keywords:** rural teacher, identity, professional development

## Introduction

The quality of teachers is the fundamental and crucial factor for the children's learning and their life-long developments, which has been proved by the mostly teacher educators and researchers around the world. Some researchers focus on the teachers' identity to explore the relationships between what teachers do and who they are (Beijaard, Meijer, and Verloop 2004; Clandinin and Connelly 1987; Korthagen 2004).
Chinese school system is the biggest one in the world. We not only have PISA test no.1 Shanghai, but also have some under developed areas such as western China, that's where this study located. China have more than 3 million rural teachers who work in the remote and poverty-stricken areas which have very limited educational resources. This article investigates the interactions between the teacher's identity and the actions of the teacher for the reform of teaching. China has 15 million teachers, about one fifth of them have served more than 50 million pupils in the rural or underdeveloped areas (Minister of Education of China 2015). Educational reforms in the rural and remote areas no doubt count on the shoulders of rural teachers. According to Fullan (2001), educational changes primarily depend on what teachers do and think, and how they understand the meanings of the reform. Therefore, before figuring out how to improve the quality of teachers, we better start where teachers are and who do they think they are.

**Various Points of View of Teacher Identity**

The literature of teacher identity contributes some insightful definitions of teacher identity and analytical frame to understand its components and formation process. Identity is the interpretation and reinterpretation of *who am I*, the meanings attach to themselves and the others. That is a dynamic and ongoing process (Beijaard 1995). Teacher identity is a unite wholeness between the identity from social perspective and from personal perspective (Lu Naigui and Wang Fuyan 2009).

Akkerman and Meijer (2011) offer a new analytical tool to research identity, they emphasize that the Dialogical Self Theory provides an elaborate framework to study teacher identity, which is conceived of as continuous and discontinuous, multiple and unitary , and social and individual. Other research shows that identity is formed and shaped in relationships with all the others, and has shifting, changeable, and unstable attributes (Rodgers and Scott 2008). Identity is a never-stopping evolving process of interpretation of experiences and also can be seen as an ongoing inquiry for *Who am I here and now* (Beijaard, Verloop, and Vermunt 2000).

**Research Purpose and Research Questions**

The article explored the rural teacher how to negotiate his identity and his action. The relationships between the sense-making of the participant with the external influences and the internal perceptions always attract the attention of the inquiry. The main aim of this research was to present the understandings from the perspectives of participant and from the viewpoint of the researcher.

The research questions are:

1. Why does the participant make the changes of his teaching in the background of positive educational reforms?
2. How does the participant interpret the meanings of his actions and reinterpret what kind of teacher he is in the background of positive educational reforms?

**Methodology**

The methodology of this study is on the basis of a multidisciplinary theoretical framework grounded in concepts and theories from pedagogy, psychology and social science, e.g. the grounded theory (Charmaz, K. 2006, 2014), the narrative inquiry and the case study. These theories provide a conceptual framework and analytic tool to understand the sense-making process of the participant and to connect the action and the identity. This case study is a research which focuses on understanding a phenomenon within its natural and authentic setting. In the study, energy is used to focus on the contextual conditions, regarded as having high relevance to the formation of teacher identity and the actions of making a difference.

The teacher A in this study is a male teacher who has taught in a village primary school for fifteen years in the mountain area of southeastern China. The study spanned sixty days, in the period the researcher has always been in the field to engage the participant observation and take a part to the school activities. For the sake of respect and ethical principles, all names of teachers, pupils and school in the article are pseudonyms.

The methods included in-depth interviews, group interviews, participant observation, the narrative inquiry, and the material analysis, which were all round the participant and interconnected. The researcher got involved from the beginning of a new term and established a friendly, warm and respectful rapport with the participant and all the other staffs in the school, therefore the atmosphere through the research could be mutually trustful, kindly, and open. During the whole period of collecting data, the role of the researcher was an observer and participant who inquired the issues, asked the thoughts, listened the stories, and shared the mind with the others.

**Interactions Between the Identity and the Actions**

This case study tries to explore the identity of a rural teacher and the interpretation process. There are five parts to present the relationships, including conscientious teacher, external factors (policies, groups etc.), life story, interpersonal relationships, humanistic education beliefs.

The teacher A always thinks differently and through the changes of his teaching he can keep his lessons attractive and interesting. Consistent with his life history research, some key beliefs and essential factors in his life are given. The background information from life history will assist to understand more elaborately and deeply the participant's action, which will make sense of the findings on the formation of his identity and practical behaviors.

***Conscientious Teacher***

Teacher A is a 39-year-old primary teacher in a village school which now only have 59 students from 3-11 years. He teaches Chinese, Morality and Life in second grade. He thinks he is not a good teacher, but a conscientious teacher.

> Willing to discover problems, research them and solve them using your experiences, that is the meaning of being conscientious.
>
> I'm good at learning from my experiences. I'm happy to make a try. I'm dare to do different things.

These interpretations of his teacher identity show the critical thinking of his teaching, he wants to deal with the problems around him. The thoughts about daring to try new things are rooted in his teaching experiences, reflections of his daily life and observations of his pupils.

***External Factors***

Teacher A is a person who think he has a mission to his local community and his homeland. He thinks he can do some good things for his people, give some valuable suggestions to his pupils' parents.

> Above all, I abide the rules and policies. Secondly, I will not bother the local. Moreover, I want to contribute myself to the development of local education. Maybe I am not good enough, but I have the will.

Teacher A thinks he has public responsibilities to his pupils and their families as an intellect, not just as a teacher. He cares very much about their needs, from this point he thinks he will change his teachings to improve the pupils' creativity and practical ability. That is one of reasons to keep him changing in his teaching and other aspects. But for a number of interviews, the claims to being a conscientious teacher was constructed in a new context, therefore that indicated some resistance to the unbearable reforms in his school. The policy of the mass dismantling of teaching points and combining schools affected his school very negatively. Teacher A thought it a disaster, it hurts his enthusiasm to teach because the scale of his village school has been cut down half from k-6 grades to only k-3 grades, the number of pupils was diminished from more than one hundred to 59. This negative impacts of the mass dismantling of teaching points is a big external force to influence him and how to recover from the damage to his identity is a new challenge to him.

***Life Story***

Teacher A was born in a poor village family. He has six siblings. His father and mother are both peasants, they can't afford his further study after he graduated from grade nine. He wanted to study longer in his schooling as possible as he could, but the family support was very limited. After he became a village school teacher, he considered himself part of the local poor community. And because he is a son of peasant and through a hard school life, he can deeply sympathize his pupils' situations and the struggling lives of their families.

> In my school life, I experienced 13 times drop out of school. At that time, I will do anything to come back, in order to change my life through the power of knowledge. I just know that.

His hard school life history made a deep impact on his teacher identity, he wanted to be helpful for his students. The different perspectives of his identity was intertwined together along with the experiences as a student and as a teacher continuing to increase.
The life story provides a self-reflection opportunity, which are viewed as self-understanding and self-interpretive framework ( Kelchtermans 2009).

***Interpersonal Relationships***
The interpersonal relationships in his school and local community are very important to teacher A. He's very gratitude to his colleagues and his pupils' parents and grandparents. He respects those people, even some of them are totally illiterate, who have wonderful spirit of hardworking and integrity. Furthermore, relationships with his colleagues was the important factor to support his changes in his daily work. He admitted that good working rapport and school culture are based on the amiable relationships, 'We have the best interpersonal relationships in our school, because I know some other schools' situations.'

> Every teacher keeps harmony in our relationships. We also have the most crucial part in common, that is the heart of education, responsibility and selflessness in our school.

***Humanistic Education Beliefs***
Teacher A summarizes some ideas and conceptions from his 15 years teaching experiences. He believes the humanistic education values.

> Education should be humanistic caring. We should not only care the children, but also care their families.

> In my point of view, humanistic teacher is a teacher who care others' needs.

He saw himself as a public intellect and a conscientious teacher. These different perspectives of his identity was intertwined together. The identity also continued to be pivotal to his future work.

**Discussion**
This study tries to sort out the relationships between teacher identity and teacher action, how the sense-making as internal process interplay with the external influences. Although the study also has several limitations, including the self-selecting sample; the limitations of the participant observation and the interview questions; the positioning of the other interviewers, the study contributes to an elaborate knowledge about how the rural teacher construct his identity and why he makes positive changes.
At the heart of the process, the researcher suggests that the two forces to shape the identity between the outer context and the inner self. These findings might be the evidence of the current literature about identity is continuing negotiation process. In the study, there are indications in which the senses of agency can construct and reconstruct identity in ways that adapt being a good teacher and a good citizen and so on so forth. In order to analyze the identity and the interactions, better to use a holistic view. Palmer (1998) gave his own interpretations of the identity, which subsume the intellect, emotion, and spirit three aspects of teacher identity. That is a wholeness and undividedness of 'who I am'. Teacher A saw himself as an intellect and a conscientious teacher. This identity also continued to be pivotal to his future work. The complicated interactions from within and from without pull the participant to do what he is inclined to do, to change, and to reform in his context.
In the study, there are two arguments can be made:
i) the interpersonal relationship in rural school and community is the very important perspective to understand the process of being a teacher, which is in the micro level of the external factors; and
ii) the autobiographical narrative, especially the school life history is the substantial framework to construct and reconstruct the teacher identity.

At the process of the formation, I suggest that the different forces to shape the identity between the outer context and the inner self.

**Conclusion and Implications**

Teacher identity is a humanistic perspective to understand teachers and their actions. The consistent and continual changes and reforms of rural education in China primarily attach great importance to the integration of teacher quality and learning-oriented curriculum. Teachers quality are central to the life-long development of student and the success of reform, above all teacher identity is central to their work and life. To a certain degree, the success of educational reform depends on an appropriateness between teacher professional identity and the requirement of reform.

The study identifies an integrated, holistic perspective to understand the teacher identity and the action. The education system and teacher education should take a new and humanistic road to support the development of teacher's sense-making and the formation of positive identity. The research of teacher identity reflects a trend, teacher identity has been studied from more and more holistic perspective, not only by the psychological and sociological lens but also by the philosophical one, including their personal lives, professional development experiences and public roles (see Hargreaves, A. 1998; Schon, D. 1983; Meijer, Korthagen, and Vasalos 2009; Day, C. 2002).

Firstly, more efforts need to be made to how to shape professional identity, the wholeness and uniqueness of teacher should be treated carefully. The more attention to the development of teacher identity should be paid overtly (Beauchamp and Thomas 2009). The rural teachers' existence and their voice should be taken into account. Secondly, for the continuing teacher education should make innovative changes to considerer both the external factors include the macro and micro level ones while the internal factors include the cognitive, emotional and moral ones (Zembylas 2003; Sutton and Wheatley 2003). Findings from this research confirm existing literature regarding teacher identity formation is an endless and life-long process of how to construct and reconstruct their meanings of "being a teacher" (Somers 1994; Olsen 2010; Thomas and Beauchamp 2011).

Furthermore, it provides particular understandings about the complexities of Chinese rural teachers' working and living. They have their inherent responsibilities to their pupils and communities, they are active to be part of the changing world. They stick to make a difference rooted their educational history and living experiences. The results suggest that in order to support and develop rural teachers, teacher identity should be regarded as the essential channel to their professional life. Teacher identity is holistically embedded in multiple contexts. Chinese rural teachers' innovative teaching are derived from interactions with their pupils, fellow teachers, head teacher, and communities. In these ways, rural teachers in the near future will be able to take a unique developing way to becoming a happier teacher and a better person. The well-being of rural pupils and the school system will be improved accordingly through collective efforts from all parts. At the process of the formation, I suggest that the different forces to shape the identity between the outer context and the inner self. The study uncovered the interconnection between the external and internal factors.

Teacher identity is a holistic perspective to understand teachers and their actions. Doing the changes and making a difference in the quality of rural teachers in China should develop and enhance the integration of teacher quality and teacher identity. Above all, teacher identity is central access to understand their work and life.

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# Inclusion and Special Needs

# Vocational Teacher's Competence in Inclusive Learning Environment

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**Abstract**
In educational political discussions diversity is approached as a challenge connected to cognitive, linguistic, cultural, ethnic or sex questions. The greatest obstacles of inclusion are connected to attitudes towards diversity. Vocational education in Finland is striving to create learning environments, schools, educational organizations, work life and possibilities to include mixed ability students according to inclusive ideology. Implementing those principles is supported by commitment, new pedagogical solutions, curricula, learning environments, flexible and individual learning paths and teachers' professional competencies. The aim is to make special needs students study together with fellow students in an environment suitable to learning and studying, despite different starting points. The number of special needs students has increased in vocational institutes. All teachers should have special pedagogical preparedness in teacher education.

The research questions were:
1. What kind of experiences do teachers have for teaching/ guiding special needs students in an inclusive learning environment at vocational secondary level?
2. What kind of competences do teachers think they are expected to have in teaching/ guiding special needs students at vocational secondary level?
3. What kind of experiences do vocational teachers have to support special needs students in practice?

The research material consisted of semi-structured thematic interviews of seven (N=7) vocational teachers in 2015 – 2016 from five various fields of science, with professional experience ranging from 5 to 28 years. The interviews were transcribed word for word.

The analyzing method was qualitative contents analysis. Attention was paid to similarities and differences of opinions. Efforts were made to create a global and clear picture of the phenomenon to be studied. Thus this research aims at the interpretation of individual experiences.

The research outcomes show that vocational teachers experience daily activities positively in inclusive learning environments. Efforts of education organizers are praised for special pedagogical solutions, various forms of support and guidance. The significance of a teacher's personal attitude to students´ progress is also clearly observable. Although the work is challenging and requires giving up traditional teacher roles, experiences of success are rewarding and encouraging. Teachers feel that when a worry appears, the matters must be grabbed immediately.

**Key words:** autonomy, diversity, early intervention, special support, life control

## Introduction

Inclusion as a concept was first expressed in the UN logo of the year of the disabled in 1981: "Full participation and equality". Accepting people´s diversity and offering support based on individual needs has not always been self-evident. We have gone through a long and winding road to this day, where all students have the right and opportunity to study together with others. The teacher´s attitude and readiness to encounter diversity and respect the demands of a special needs student reveal the teacher´s human conception. Pedagogically it means student-centered culture with genuine action and interaction.

This article examines the readiness of vocational teachers to encounter special needs students in inclusive learning environments. Today we have moved from the time of inequality to social equality so that all can participate, influence and make choices. The new student welfare law (1287/2013) strengthens the learner´s autonomy and lowers the threshold of early intervention in the questions of learning and studies.

The concept of `inclusion` emphasizes the right of all disabled people to belong to ordinary communities instead of being placed in their own separate service systems. Respecting human dignity and the right to participate in the decisions concerning the disabled themselves has been written in numerous declarations of human rights and political programs both nationally and internationally (e.g. the declaration of Salamanca 1994, the programs of the policy of the disabled by the UN and Unesco, international human rights, national constitutional fundamental rights, non-discrimination act 2004). The basic message of inclusion is anchored in the central principle of the human rights agreement which bans discrimination (United Nations 2007; ILO 2004). In this article the special needs student will mean all students whose need of support is greater than general guidance.

Inclusive learning environment sets the education organizers in front of many challenges, but simultaneously also offers opportunities to search for new and fresh pedagogical solutions. Student-centeredness is a central value in the strategies that direct the action of organizers. Respecting and valuing the student in the direction of his/her individual goals describes the concept of student-centeredness in practice. Dunderfelt (2015) describes the idea of student-centeredness through the gift of listening:
*” When I give the student a gift of genuine presence and listening, he/ she also wants to give me the same kind of gift of listening back. Then there is born between us a shared mode of respectful listening to each other´s views, experiences and needs. We both feel that we become seen and heard.” (Dunderfelt 2015,7.)*

In my doctoral thesis the special needs students told that they were treated respectfully and they could feel themselves as persons, not cases. Satisfaction and joy of life came from teachers´ caring, their listening to them in difficult moments and concern even when their own resources were scanty. (Koukkari 2010.)

**Pedagogical Opportunities of Inclusion in Vocational Education**
In our past, our learning culture appreciated high quality results in studying and learning. Inclusion represents a quite opposite model. It speaks of equal rights to learn, which need political decisions to be implemented. In Finland there is a lot to develop about inclusion. Opponents are found both among teachers and students. Saloviita (2013a) justifies community learning, as follows:

*"An interesting result of our study is the equal experience of many interviewees of not having been able to succeed in vocational education because of their background in special needs education. These young people told that their readiness and competences from special education classes did not correspond to the requirements of vocational studies. The interviewees described that they had had to drop out, because in primary school, in special classes they had not been demanded that kind of competence which was the starting level in vocational education.”*

Teachers all over Europe have felt that their greatest challenge at work is encountering learner diversity. In educational political discussions diversity is approached as cognitive, linguistic, cultural, ethnic or sex question. (Mäkinen & Nikander & Panzar & Saari 2009.)

The obstacles of receiving special needs students are not necessarily expressed in teacher speeches or organizational readiness, but the attitudes to diversity appear in surprising and unanticipated situations. Thus the educational unit´s preparedness is connected to its culture and how well the staff

in encouraged to open interaction, collaboration participation and responsibility. Attitudes are of great significance in creating the spirit of inclusive learning environment – everyone is involved with their experiences and expectations. The readiness to act in an appreciating and considerate way is always everyone´s responsibility. (Artiles 2003.)

Vocational education in Finland is changing constantly: now we are reforming it for instance by emphasizing work life connections and making efforts to include them in learning environments and active pedagogy. Vocational pedagogical action is guided by different strategies of teaching and learning, beliefs, values and substance competence. Recognizing pedagogical beliefs and preconceptions, exploring and reflecting them is a great possibility to develop and promote wellbeing at work. It requires sensitivity to observe and reflect on one´s thinking habits and practices. "*Learning to be a teacher is not only developing competences, skills and knowledge*, *but essentially it is becoming a teacher."* (Aarnio 2010; Garrison & Kanuka 2004.) This is well connected to a description of the various roles of a future teacher: a creative actor in more open environments than before, a personal coach in individual learning environments, master of digital competences, developer of networks and collaboration, innovator of pedagogical alternatives, recognizer of future signals (Koukkari & Kepanen 2013; Ainscow 2006; Ryymin 2014; Nuutila 2010.)

Reform of vocational education emphasizes the student´s key skills of lifelong learning. They are continuous learning, taking over new situations and coping with the changing work life circumstances. Students who have clear conceptions of their ability to cope, engage in their studies, and usually reach their goals. Another important aim is student-centered thinking: supporting individual learning paths, recognizing the need of student-oriented support and increasing all kinds of commitment in individual and social contexts. There is a clear connection of the influence of success and failure on choices and decisions. (Caprata & Cervone 2006; Hirvonen & Muuronen 2014, 28-35; Honkanen 2008; Miettinen 2015.)

**Special Support in Vocational Education**

Special support is useful to all students. Miettinen (2015) connects the structure of inclusive learning environment to a teacher´s special pedagogical competence which can be justified by student-centeredness and individual guidance of studies. It follows education political decisions and promotes the opportunities of students´ equal education. In order to confirm goal-oriented action and student learning, these special education principles of pedagogy should be spread to general vocational institutes. (Miettinen 2015.)

The basic competence of a vocational teacher is interactive skills. Wihersaari (2010) states in his doctoral thesis that the essence of teaching is in professional and adult-like encounterings. It creates an active and interactive relationship between the teacher and student. This relationship is a dialogue or reciprocal meeting in which both partners give and share something personal. (Wihersaari 2010.)

I will approach the interactive competence of a vocational teacher from the viewpoint of five basic skills. Their aim is to promote a special support needing student´s: life management, engagement in studies, encourage participation, create belief in the future and make feel a valuable person.

The first principle is *respect.* It means believing in the change and possibility of reaching goals through shared action Trust is included in respectful encountering, and respect promotes trust in interaction. (Hirvihuhta and Litovaara 2009, Kananoja 2010, Laine 2010.) Recognizing the need of special support may arise from the concern the teacher feels towards the student. Early intervention in the matters of concern shows that the teacher pays attention to the student and meets him with respect.

The second principle of interaction is *listening.* Solution- and resource-based thinking strives to recognize a person´s individual resources and hopes for the future (De Jong & Berg 2008). Without

sensitive presence and genuine listening, the teacher cannot recognize the needs of a student. Conscious presence challenges the critical observation. Learning to genuinely listen requires skill, capability and empathetic unselfishness. Active listening can be promoted by suitable questions to direct the discussion towards targets. The feeling of being heard in interaction makes active and includes a motivational element.

The third principle is *concentration.* It is deeply connected to the skills of knowing and leading oneself, of being aware of one´s personal behavior and readiness to meet diversity. Leading oneself is the strength in a teacher´s work. It builds the basis to understanding the teacher - student relationship. In being able to lead himself, the teacher can also lead the student professionally in an adult role. Good self-knowledge will help him tolerate the special needs student´s outbursts and critical comments.

A successful interaction situation is often described with adjectives of atmosphere: chatty, positively emotional, sincere, easy, humorous, funny etc. Hirvihuhta and Litovaara (2009) call the interaction described above by the concept *levity*. It means neither superficial relationship nor the lack of targets, but emphasizes genuine and energizing presence. It also creates trust.

The fifth principle*, tolerance* includes elements of commitment, human relationships and acting together. Targets can often be attained along different paths with choices along the way. Making choices requires tolerance and acceptance of uncertainties and frustration. Though thoughts may not always be positive, a tolerant attitude can help pass dark and energy-consuming moments: *you cannot often get rid of your thoughts, but you can influence their directions*. You have to proceed with short steps towards your dream.

**The Aim, Research Questions, Material Collection and Analysis**

The research concerns the readiness of vocational secondary teachers to encounter and recognize special support needing students in their studies. The law of vocational education (246/2015) obliges education organizers to provide study opportunities shared by all. The status of special education institutes is discussed ethically and educational-politically, and a clear direction in organizing vocational education to special support needing students will widen and deepen the principles of inclusiveness. This challenges the competence of vocational teachers and vocational teacher education – how is the challenge met for the best of the student? The aim of this research is to start professional discussion about the culture and measures of inclusive learning environments to make studying towards individual goals possible. The purpose is, due to the discussion, to develop vocational teacher education to meet the requirements set to the teacher competence in vocational education.

The research questions are:

1. What kind of experiences do teachers have for teaching/ guiding special needs students in inclusive learning environment at vocational secondary level?
2. What kind of competences do teachers think they are expected to have in teaching/ guiding special needs students at vocational secondary level?
3. What kind of experiences do vocational teachers have to support special needs students in practice?

The research material consisted of semi-structured thematic interviews of seven (N=7) vocational teachers in 2015 – 2016, from five various fields of science with professional experience ranging from 5 to 28 years. The interviews lasted 45 minutes each and were transcribed word by word.

The analyzing method was qualitative contents analysis. Attention was paid to similarities and differences of opinions. Efforts were made to create a global and clear picture of the phenomenon to be studied in relation to a wider context and earlier studies. (Hsieh & Shannon 2005). This research aims especially at the interpretation of individual experiences.

In the analyses the thematic areas of discussions were obtained and divided into categories to which the interviewees speeches were classified. Efforts were made to describe the phenomenon studied through these thematic categories.

**The Outcomes**

***1. What kind of experiences do teachers have for teaching/ guiding special needs students in inclusive learning environment at vocational secondary level?***

The teachers felt that early intervention is extremely important in student learning. Talking about the concern immediately when it is noticed decreases incompetent interpretations. They are not based on facts, since every teacher makes interpretations due to his life world, and there is a danger of directing student guidance wrongly.

*a) "When a concern arises it must be handled immediately"*

Early intervention requires, according to the teachers, concentration on learner knowledge and sharing the student´s background information. The teachers think that it is not enough to acquire information through student speech only, since even essential information may be forgotten.

A teacher describes the importance of early intervention and pitfalls of interpretation through the following example:

*" A student behaved oddly, eyes were wandering, and he seemed absent. All teachers thought he used drugs, until it appeared that he was visually impaired, he had tunnel vision which was focused on a certain area."*

A worry is context-bound and often based on teacher intuition. It comes up in certain situations. For that reason, the teachers should know the students and be interested in their backgrounds

*b) Creating trust*

The interviewees felt that there must be trust between the teacher and student in order to be successful in teaching and guiding. The trust is described as safe, honest and equal atmosphere. The teacher has a remarkable role in creating and keeping it. If a teacher wants to be above the student, there will be no trust. The teachers feel that students expect them to be equal but at the same time solid adults keeping to the agreed rules.

*" Some students may think that I am too strict, but I want to create an atmosphere in which everybody can feel safe, and the same rules apply to everybody, without forgetting individuality. The students praise me for this touch."*

Creating the atmosphere of trust sometimes depends on very little. The teacher´s interest in the student is crucial. Giving time for a student without the sense of haste is important. Time is the teacher´s choice and conception at work.

***2. What kind of competences do teachers think are expected for teaching/ guiding special needs students at vocational secondary level?***

The teachers feel that different life management issues are the greatest challenges causing the need of special support among young and adult vocational students

*a) A skill to guide life management*

The guiding competence connected to life management issues is needed daily. This competence cannot be separated from substance competence, because student situations are present in the lessons. The issue is a fine division between encountering and interaction combined with professional elements of responsibility, equality, justice and caring.

Teachers describe their work as encouraging and availing of common sense in life management issues. It is a skill of being a listening adult.
*" A teacher must be an adult and be ready to listen to the students' worries."*

The teachers feel that the importance of intuition in recognizing the need of special support is significant in understanding situations.

*b) Special-pedagogical competence*

Students have clearly needs of support connected to special pedagogy, and they need competent help in them. Teachers feel that learning difficulties are such things that need expert competence. For that reason, consulting and collaboration are important and necessary, in the following way:

*" Contents connected to special pedagogy should be included in teacher education programs. They open the understanding of many issues that you did not know or did not know the reasons for them."*

Despite feeling defective in special pedagogy, teachers think that they can cope well in inclusive learning environment. With experience and inclusive approach to work they can cope even in challenging situations and answer meaningfully to the needs of special support.

In questions of their special pedagogy competences the teachers emphasized the significance of collaboration with special education teachers with extensive competences, which was meaningful especially concerning learning difficulties.

*c) Competence in teaching methods*

Teachers´ clearest competence deficit was connected to recognizing the student´s need for special support. It could be connected to special pedagogy competence, but the teachers speak of it as a methodological need in teaching and guiding. It is considered a starting point of planning, implementing and evaluating in teaching and student-centered choices. Digital pedagogy also offers challenges to teachers´ competence.

*" Sometimes I long for more knowledge of pedagogical methods to meet the students´ troubles in learning…"*

Inclusive learning environment challenges the teacher to plan teaching so that students´ individual needs, skills and abilities are paid attention to and every student has a possibility to experience the joy of learning and reach learning goals. The teachers felt that the important thing is to recognize the student´s way of learning:

*" For foreign students the tasks must be explained in various words. For some students the same thing must be drawn, … and you have to spell and show what must be done…"*

Motivating students to learn seems to be the spearhead of teachers´ pedagogical competence. Learning-at-work and in real work situations have been motivating and promoted learning results.
*" We have one group of students, including some who have various needs of special support and also normal students. Studies take place in work life. There is always a vocational teacher and, if needed, a general subjects' teacher in the group. Theory is studied with practice. This has been a motivating way of learning, and the special support needs are not just noticed. Students are motivated to study and get the professional degree."*

This experience above also tells of the change of teacher role. You cannot cope alone, and it is not the purpose. Merging of theory and practice is true in educational practices.

***3. What kind of experiences do vocational teachers have for supporting special needs students in practice?***

The teachers felt that the attitudes of education organizers are the most important motivator of a teacher´s successful work among special support needing students.

*a) The attitude of the education organizer*

The teachers saw that the attitudes towards inclusive learning environment were mainly positive, both among teachers and work community, as well as education organizers.
The positive attitude of an organization is described by a teacher´s experience:
*" My superior has changed my way of thinking fully positive towards inclusiveness, and also stressed that the student may never be left alone trying."*
The attitude also reveals that money is not a decisive factor when the need of a student´s special support is assessed.

Teacher talk also concerned work resources and their meaningful targeting. They felt powerless e.g. in taking care of students´ absences. They thought that there would be enough resources for reaching the students, if they could agree on the rules with the education organizer.

Inclusive learning environment requires teachers´ collaboration, sharing competences and genuine student-centered approach. Teachers feel that expert help and support is necessary. They regard it as valuable that education organizer observes their coping in daily work. It is also criticized, as below:
*" Students can come to a learning workshop to do their homework and other school tasks. They can also talk with other students and feel that they are not alone with their learning difficulties."*
" O*n our property there are not necessary capacities for taking care of special needs. … We would need small rooms for that."*

Knowing students is experienced a meaningful aid in pedagogical planning. Teachers´ message is that students are taken care of in vocational education, nobody is really left alone.

*b) Teachers´ personal attitudes*

The teachers felt that the attitude towards understanding diversity is decisive in inclusive environments. Personal attitudes can either promote or prevent the sense of community and the atmosphere of participation. A factor promoting participation is the teacher´s charity and optimism:*" The students are not intentionally difficult. You have to be able to separate different problems."*

Coping and promotion in studies of the students encourages teachers in their work. They feel joy when students succeed. Mastering pedagogical methods is seen important, but the most important of all is caring the students and offering support and guidance. Teacher competence is clearly focused on the elements of intrapreneurship: caring, determination, goal-orientation and humanity. He should have a big heart:
*" We will participate in everything with a big heart. Situational sensitivity … Humor pedagogy. Twinkle in the eyes always! The student perspective is the first".*

The teacher´s attitude appears in his way of telling about his work and competence in inclusive environment. The differences of problem-speech and resource-speech are noticed in teachers´ work approach. Even situations that sound difficult are different depending on the attitudes. Ability to lead oneself becomes observable through the teacher´s courage and humility to reveal his own pain points. Sharing these experiences with a student can be a key to attaining the student´s trust and opening the knots of his studies. They will motivate the student to strive in his studies and lower the threshold of seeking for help and guidance.

**Conclusions and Themes for Development**

The outcomes show that vocational teachers experience their daily work in inclusive learning environments as positive. It is seen also in the attitudes of education organizers in their trying to create opportunities to adopt various pedagogical measures in guiding and supporting special needs students.

The results also reveal the need for special education teachers. Students´ learning difficulties are issues which make vocational teachers need an expert´s understanding and help. Learning difficulties are classified according to diagnoses, but concentrating on the student´s strengths and coping in decisions, special support through individual goals is often attained. It is said that special education is especially good education for all.

Also the importance of teacher emotions in interaction is observed. Teachers describe it as a continuous state of being awake and sensing with tentacles. Their sensitivity has been tuned to the frequency of student need for support. Eriksson & Arnkil (2012) describe the meaning of early intervention as appreciating and valuing a person. When the worry appears the teachers may forget that the student does not experience and feel the things in the same way as a teacher. Knowing this may help the teacher to express the concern.

Feeling of belonging is one of the basic human needs. Building inclusive learning environments tries to respond to this need which challenges the education organizers, work communities, teachers and students. Vocational teachers felt that they were supported by their colleagues and student welfare service representatives significantly in their efforts. Succeeding in inclusive education also needs curriculum reform and development.

The most essential changes are connected to strengthening competence-based programs, optional paths, choices and flexibility in organizing education. All vocational degrees and their parts are based on competence. A teacher having good skills in leading oneself can meet the pedagogical and ideological changes of the curriculum professionally and renew the contents of work. According to Nissilä & al. (2015) a vocational teacher lives in a constant change in which competence-based pedagogy in seen as a resource which strengthens student autonomy and teacher motivation. The teachers felt joy and satisfaction in team teaching and sharing the duties with work community. (Nissilä & Koukkari & Karjalainen & Kepanen 2015; Lani 2013; Kepanen & Länsitie 2014.)

Refreshing elements of a teacher´s work described above appear also in this research. Inclusive learning environment is normal according to the teachers. Although work is challenging and requires rejecting traditional teacher roles, the experiences of students´ success are rewarding.
What do the conceptions of diversity, specificity, special education, special support etc mean in the context of inclusiveness? This was discussed in several studies (Saloviita 2013b; Hirvonen & Pynnönen 2010; Kaikkonen & Hirvonen & Pirttimaa 2010). The basis is respecting everyone´s autonomy and rejecting all kinds of segregation, the freedom of being a human and enjoying it. Expertise in inclusive learning environment is shared, multi-professional and team teaching are required in addition to substance knowledge. More flexible learning paths than before and heterogeneity of students demand every teacher an ability to respond to students´ changing individual needs of support in learning. Koukkari 2012; (Kaikkonen & Hirvonen & Pirttimaa 2010.) Will the required competences be gained through teacher education? Does the guidance of special education students belong to the teacher´s basic task? These questions and many others remain to be answered later.

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# Education for Social Justice, Equity and Diversity

# Can International Practicum Develop Intercultural Competence Among Teacher Students?

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**Abstract**
European classrooms have become more diverse due to immigration. This implies new challenges for teachers and teacher education. However, the majority of teachers and student teachers in Norway are majority culture Norwegians with little experience or knowledge of other cultures. An international practicum is potentially effective in transforming learners' perspectives and preparing teacher students for work in a diverse classroom. This study draws on discourses within transformative learning theory, intercultural sensitivity and diversity in an attempt to understand student teachers' experience during an international practicum (The eexperience of *otherness* is central in Mezirow's theory of perspective transformation. The students will experience the differences between teaching in an unfamiliar setting and teaching in their home environment. The culture shock that many will experience may be a catalyst with the potential to bring about a change in frames of reference that could, in turn, lead to increased cultural sensitivity. To learn to be mindful of other people and open to diversity implies the recognition and experience of otherness. However, this will depend on the ability of the student to reflect and elaborate on an existing point of view and habit of mind and transform it into a new frame of reference. Thus, international experience alone does not necessarily make the students interculturally competent. With Mezirow's theory in mind, a central question emerges: how can we design a programme that will foster transformative learning? At Hedmark University of Applied Sciences (HUAS), the international practicum programme consists of three phases: pre-departure, in-country and re-entry. The programme is designed to help students enhance their learning outcome by providing relevant knowledge and stimulating reflection on their experiences. Traditional non-interventionist programmes are waning in popularity and most new programmes are based on "a new paradigm, based in the understanding that students learn more effectively abroad when we intervene in their learning" This study addresses the following two questions: i) How are Norwegian student teachers' global perspectives and intercultural competence changed during an international practicum in Namibia? ii) How can institutions design an international practicum to enhance the learning outcome? The study employs a qualitative method involving semi-structured and structured interviews of participants in international practicum and teachers that have taken part in international practicum previously. They are invited to reflect upon their experiences during the practicum period. Text analysis is used to analyse and systematise the data.
The international practicum seems to have helped some of the student teachers to feel more at ease living and working in a multi-ethnic and multicultural society. Many of the students became more open and tolerant and developed their communication skills in their interaction with people from different cultural backgrounds. They learned to appreciate, tolerate and become more open to cultural differences. For some students, however, the difference in culture gave them a negative impression of Namibian society and culture. For these students, their stay may have reinforced negative stereotypes.

**Key words:** International practicum, Namibia, Intercultural Competence

## Context of the research

Norwegian schools are becoming increasingly diverse due to complex migration patterns, bringing learners from a wide variation of ethnic backgrounds to our country. In order to work effectively, teachers need to develop intercultural competence (Deardorff 2006). Teacher education institutions are facing the challenge of how to educate teachers with the capability to function effectively in this complex classroom setting (Bathurst and La Brack 2012). In White Paper no. 11 (2008-2009), the

Norwegian government states there is an urgent need to increase international exposure among student teachers. In 2014, less than 6 % of student teachers took part of their education abroad. The Minister of Education and Research has presented this as a challenge to the quality of teacher education, as student teachers have the lowest exchange rate among students in higher education in Norway (SIU Report 2-2016).

**Research aim and research questions**

Until recently, it was commonly believed that immersing student teachers in an unfamiliar culture would develop the students' intercultural competence (Cushner and Mahon 2002, 2009; Cushner 2007; Stachowski and Sparks 2007; Walters, Garii and Walters 2009; Wiggins, Follo and Eberly 2007). Lately, however, this belief has been challenged. Some researchers claim that being in another country does not automatically make a person interculturally competent (Hammer 2012; Engle and Engle 2012; Zull 2012). It might be more correct to argue that being exposed to other cultures is a necessary but not sufficient condition for students to become interculturally competent. Hedmark University of Applied Sciences (HUAS) offers international practicum in Namibia for pre-service primary school teachers. 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 complete a small fieldwork project for their BA thesis. The goals of the international practicum are to increase the students' intercultural competence, help them to acquire new perspectives on education and schooling and allow them to experience living in another country in order to enhance their understanding of global issues. The debate on the effect of this type of programme has led us to question in several ways the international practicum programme that we have delivered since 2006. Our research questions are: How are Norwegian teacher students' global perspectives and intercultural competence changed by their participation in an international practicum in Namibia? How can institutions design an international practicum to enhance the learning outcome?

**Theoretical framework**

The theoretical framework for this study is provided by Bennet's developmental model of intercultural sensitivity, Mezirow's transformation theory, whiteness theory and neo-colonial development theory.

Bennett's developmental model of intercultural sensitivity (DMIS) describes the stages a person must pass through in order to become interculturally competent. The DMIS identifies the development of orientations toward cultural difference from an ethnocentric to an ethnorelative stage (Hammer, Bennett and Wiseman 2003). The model identifies three ethnocentric orientations, where one's own culture is experienced as central to reality (Denial, Defence, Minimisation), and three ethnorelative orientations, where one's own culture is experienced in the context of other cultures (Acceptance, Adaptation, Integration). Denial is typically the tendency to avoid noticing cultural differences. Defence is when one's own culture is experienced as the only viable one, the only good way to live. Minimisation is when one's own culture is perceived as universal; the assumption that, for instance, learning styles and behaviour apply equally well in all cultures, implying a lack of understanding that culture is context. Acceptance is when other cultures are experienced as different, but equally human. Often this will imply the ability to reorganise one's own perspectives to be more like the worldview of the target culture. Adaptation is the ability to perceive and behave in culturally different ways, and integration is the process of easily moving in and out of different cultures (Hammer et al 2003). Bennett's model is embedded in a constructivist paradigm, which means that perspectives change/transform through confrontation with other people's perspectives or realities. Immersing students in another culture creates a milieu that has the potential to transform perspectives.

Mezirow's transformative learning theory explains how this transformation can take place. According to Mezirow (1981, 1997), it is important to understand that adult learning differs from childhood

learning. Adult learning is about changes in meaning perspectives, which include broad sets of psych cultural assumptions that form an individual's worldview. Mezirow defines transformative learning as a process of using an *a priori* interpretation to construct a revised interpretation of the meaning of one's experience to guide future actions.

Whiteness theory is useful in analysing why international practicum might not lead to enhanced intercultural competence but instead reinforce stereotype perspectives of others and reveal neo-colonial attitudes. Whiteness theory offers an analytical tool to understand why transformation of perspectives in an ethnorelative direction is so difficult for white people. According to Frankenberg (1997) the social phenomenon of whiteness consists of three linked dimensions. "First," she argues, "whiteness is a location of structural advantage, of race privilege. Second, it is a "standpoint," a place from which white people look at themselves and others, and at society. Third and most importantly, "'whiteness refers to a set of cultural practices that are usually unmarked and unnamed" (Frankenberg 1997:1). Under all circumstances, a white person will act as a member of the majority population and therefore define norms and values. Whiteness theory is closely linked to neo-colonial theory. Both theories explain why and how European cultural hegemony is being upheld even by formerly oppressed nations (Haug 2015). A central aspect of whiteness theory is that white people are seldom aware of their attitudes and privileges (Hartmann, Gerteis and Croll 2009). They often see the values and norms of their own society as a goal for all societies.

**Research methodology**

In line with qualitative methodology, our research focused on the meanings, values, intentions and emotions of the informants, with the main goal of obtaining an understanding of their perspectives (Kitchin and Tate 2000). Drawing on the methodology of Willard-Holt (2001), developed for pre-service teachers in international programmes, we developed two open-response questionnaires to be answered pre- and post-practicum. The semi-structured questionnaires were designed to provide insight into the characteristics and outcomes of a perspective transformation. The pre-practicum questionnaire and the post-practicum questionnaire are very similar in order to allow a direct comparison to show how the 3-month practicum has affected the students in terms of issues related to intercultural competence. The questionnaires consist of a mix of fixed questions where the respondents mark their perceived level of, for instance, tolerance or knowledge on a scale, and open-ended questions where the respondents explain and elaborate in their own words. In addition, we conducted one focus group interview halfway through the students' practicum and one after their return. Individual tutoring, three written student reflection notes and several informal conversations with the students during and after their stay abroad also contributed valuable knowledge to the study. The group interviews and reflection texts were analysed using inductive open coding. The data was collected from three cohorts of students: seven students in 2014, 8 students in 2015 and 7 students in 2016.

**Results**

The main objective of the international practicum programme is to help student teachers to become more globally oriented and increase their intercultural competence. How well do these aims match with the students motives for applying for the programme? In general, most students focused on personal growth and an interest in experiencing another school culture as their main expectations. They wanted to *"learn about myself, be better in speaking English, personal growth, and increased self-esteem both on the personal and professional level".* Some students said one reason for applying for the programme was to experience another culture. Some expressed a hope that living in another culture would be helpful for them as teachers in a multicultural classroom;

> *I want to go to Namibia because I think this will enhance my understanding of other cultures, give me an insight into how learning takes place in another cultural context. I think I also will get knowledge that will be useful to me as a coming teacher in a multicultural Norwegian classroom.*

> *I am looking forward to meet people that live different lives form mine and be challenged by their worldview in general, learning, and teaching more specifically.*

One of our research question is; how are Norwegian student teachers' global perspectives and intercultural competence changed during an international practicum in Namibia? Intercultural competence "refers to the acquisition of generalizable intercultural competence: that is, competence that can be applied to dealing with cross-cultural contact in general, not just skills useful for dealing with a particular other culture" (Bennett, 2012). Our research does not give a clear answer. The findings are difficult to interpret and vary from student to student. For analytical purposes, we have divided the students into three broad categories on the basis of our findings: those who during their stay feel that their own culture is superior and have their stereotypes reinforced; those who minimalize cultural differences and come back with a feeling that the other culture lags behind their own culture; and those who open up to the other culture, acknowledge cultural differences, and accept that norms and values are different but equally valuable. We elaborate on these results below.

Experiencing another school culture can lead to new perspectives, challenge stereotypes and generalisations about groups of people and promote reflection upon one's own culture and values (Merryfield 2000). Getting the opportunity to work in Namibian schools placed students in a situation that could challenge them to reflect upon the idea that teaching is embedded in ideologies. However, few students were able to reflect upon and look for reasons for the teaching style they observed. Most students criticised the teacher's classroom practices without looking for reasons, and some used their position as (white) outsider to criticise and even report the teacher to the headmaster, as in the following example:

> *The student was observing an experienced Namibian teacher, the subject was English and it was in grade 4. The teacher was the authoritarian type, raised her voice constantly, hit the learners with a stick. In between controlling the class, she took several private phone calls. The Norwegian student teacher was deeply frustrated on behalf of the learners and reported the teacher's behaviour to the education authorities as well as the head master. The teacher got angry at the student teacher. The student teacher was placed with another teacher because the first teacher refused to take her in her class again.*

The student's behaviour was completely unheard of in a Namibian context. A Namibian student teacher would never have reported a teacher to the headmaster. However, the Norwegian student felt that she had to report the teacher and did not understand when she was told that in a Namibian context what she did was unacceptable. The situation she observed is common in Namibian classrooms. Most students expressed frustration at the forms of classroom discipline they observed. Learners were punished for not performing well enough, for example. Although Namibian law prohibits corporal punishment, it is still a common feature of classroom discipline. The teachers also commonly used psychological bullying and public humiliation of their pupils. The Norwegian students found this disturbing and upsetting, and some were so concerned that they interfered or took the matter to the headmaster.

However, other students were more sensitive to the host culture and felt that they as outsiders were not in a position to interfere. Look for instance at this situation in a grade 3 classroom described by a student teacher:

> *The learners shall read loudly in front of the class. The teacher picked a learner that do not know how to read. The teacher let him stand in front of the class for a long time while both the teacher and the rest of the class mocked him. I have never seen anything as humiliating in my life. I wanted to leave the room but I did not. Instead, I sat silently at the back of the class and cried. I still wonder if I should have interfered, protested, complained to the headmaster….*

These two examples illustrate two different behavioural responses; one student teacher acted and felt she had done the right thing, while the other did not act upon the situation and felt bad about not acting. However, there is also a striking similarity between the two examples: in neither case did the student question the reasons behind Namibian classroom practices and the teacher's behaviour. We found this to be a typical response. Rather than looking for reasons, many students developed a negative perception of the local school culture that strengthened their belief in the superiority of Norwegian school culture. We found little reflection among the students on how the local culture, values and customs influence classroom practices and teacher-student relationships. Instead, most student teachers felt that Norwegian teaching methods and values were superior to what they observed in Namibia and that Namibia was lagging behind developed countries, as the following quotation illustrates:

> *I think they are lagging behind and teaching as we did during the 70s or we must go back to the 50s in Norway to find teachers and teaching that can be compared to what we have seen in Namibia. …. If they want to become a developed country, they have to change their attitudes and their values…*

Low learning outcomes are a problem in Namibia. Learners struggle to meet national competence levels in reading, writing and mathematics. Some students blame the Namibian teaching style and teachers' attitudes towards learners for this situation. According to the Norwegian students, the typical Namibian teacher conducted teacher-led, top-down teaching with little dialogue, little differentiation and little focus on motivation or concern about learning outcomes. The teaching style was mostly authoritarian and teacher-centred.
However, some students see that there might be other reasons for generally low learning outcomes than the teaching style. They see that most learners come from poor families with small resources and acknowledge that the family situation might be one reason for low learning outcomes, as this student's observation illustrates;

> *Most of the learners are from poor households. Their parents do not help them with homework, they have to look after siblings, and they do not get enough food. I think this is the reason way they struggle to learn. It is difficult to concentrate when you are hungry, and afraid of the teacher.*

This observation is supported by the research literature. Children from poor households tend to succeed less often in primary education than children from more well off households (Colclough et al. 2003). There are many reasons for this: lack of fulfilment of basic needs, the need to earn an income, help with reproductive work and lack of money. In a study of 14 southern African countries, Smith and Barret (2011) find a significant correlation between numbers of meals a day and reading scores, and they argue that hungry children are more likely to be lower achievers because they cannot concentrate. Parental support and educational background is also of importance for pupils' learning outcome. A characteristic of poor households is that they seldom have resources to support their children's homework. In addition, they less often follow up by taking part in meetings at school or contacting the teacher directly. Some of the student teachers took part in parent-teacher meetings and commented that few parents showed up.

We have seen that many students come home with a negative attitude towards the Namibian school system, as illustrated by the classroom examples above. Nevertheless, some students have become able to also see the other culture as different, but equally human. Some students said that there were aspects of the local culture that they admire and appreciate as valuable no matter how different they are from their Norwegian experiences. Furthermore, they point to values in Namibian culture that we have lost in modern Norwegian culture, such as sharing even if you do not have much. For some

students, being in Namibia has put Norwegian society and culture into perspective. They see that development comes at a cost – the loss of solidarity and joy:

> *Everyone is welcome in everyone's home. I am not used to this from Norway. It reminds me of what I heard Norwegian society used to be like and I like it! The sharing and the solidarity I see impresses me. They share everything, even if they do not have much. I was told: Here we are all related, regardless of blood relationship*.
> *It has made an impression on me that they are so happy given the poverty they live in. Moreover, how Christian they are and honest…..even if they are lagging so far behind in development.*
>
> *The Namibian school culture and teaching style is inferior to the Norwegian. Nevertheless, their culture in general has many positive aspects; people are so friendly and nice to foreigners.*

This quotations show that they admire some parts of the Namibian culture. Friendliness and expressing happiness are forms of human behaviour that also are appreciated in Norwegian culture and thus easy to appreciate for the student. However, the quotations can also be read as a reinforcement of stereotypes. Namibians are described as poor but happy people. When it came to types of behaviour regarded as negative in Norwegian culture, like for instance an authoritarian teaching style and corporal punishment of children, all the Norwegian student teachers reacted negatively. However, even aspects of Namibian culture that they did not value may have provided a learning experience for the student teachers. For instance, their experience with an authoritarian culture helped some students to develop a better understanding of the cultural norms and values they have as Norwegians. The ability to develop an understanding of how norms and values differ across cultures is an interesting outcome of the stay in Namibia. However, it is not possible for us to see to what extent the students are able to utilise this understanding to develop their intercultural competence, i.e. to use this knowledge when dealing with cross-cultural contact in general.
Most of the students have become more at ease living and working with people from another culture. Moreover, they claim that they are better prepared to work in a multicultural classroom because of their stay in Namibia. Their experience of cultural differences seems to have helped them to be more aware that people might react differently to the same situation depending on their cultural background. As one student put it:

> *Before I left for Namibia I believed that people were more alike – now I have experienced how much our values can differ".*

To sum up: many of the student teachers in this study felt that their own culture was superior and had their stereotypes reinforced by what they experienced in Namibia. Furthermore, they felt that in order to develop, Namibians must change their behaviour and values to be more in line with our norms and values. A few students acknowledged cultural differences and accepted that norms and values are different but equally valuable. However, most students feel that their stay in Namibia has resulted in personal growth and that they are better prepared to work in a multicultural classroom because of their experiences.

These findings have led us to reflect upon the preparation, structure and implementation of international practicum. The international practicum programme at HUAS consists of three phases: pre-departure, in-country and re-entry. Based on the understanding that "students learn more effectively abroad when we intervene in their learning" (Vande Berg and Paige 2009, p. 433) the programme is designed to help the students to become more interculturally competent. Therefore, the question is how can the programme be improved to achieve this aim more effectively? According to Vande Berg et al. (2012), the key is to support student reflection. The students need close mentoring and processing in order to make meaning of their experiences. . As an institution of teacher education, we must therefore put more effort into guiding and mentoring the students while in Namibia and after

their return if we want to reach the full potential of the programme. One may question the ambitions of the programme and the length of the stay. Is it realistic to expect a 3-month stay in Namibia to develop the students' intercultural competence? Another question is how well we as faculty prepare and help the students to reflect upon their experiences. The students need close mentoring in order to make meaning of their experiences and learn to reflect on themselves as cultural beings. Immersion is a necessary but not sufficient condition for intercultural competence as an outcome of international practicum. However, Merryfield (2000) questions if today's teacher educators, who are mainly from white middle-class backgrounds, have the lived experiences and perspective consciousness needed to prepare the student teachers.

**Conclusions and discussion**

Our findings are in accordance with those of many other studies: immersing students in another culture does not automatically mean that they become interculturally competent. Some of the students in our study have learned to appreciate the difference between cultures and have opened up their minds and increased their acceptance of differences. However, others have come back home more certain than ever of the superiority of their own culture. Whiteness theory helps us to understand why it is so easy for our students stick to their initial perspectives, as it is natural for them to interpret the other culture through their own cultural lenses. Theoretically, the culture shock that many students experience could act as a catalyst for change in their frames of reference, which in turn could lead to increased cultural sensitivity. However, this will depend on the ability of the student to reflect and elaborate on an existing point of view and habit of mind, and transform them into a new frame of reference. Another outcome of culture shock might be that one sticks to one's initial biases regarding groups and cultures and the conceived superiority of one's own cultural values and habits. Transforming one's perspective is less common than making the "new" fit into existing frames of references (Mezirow 1997). The main findings from the present study seem to support the contention that it is easier to stick to one's initial perspectives on one's own and other cultures. Moreover, our preparation and follow up of the students have not been able to counteract this.

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# What We Talk About When We Talk About Citizenship. Why Citizenship Education Has to be Critical

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**Abstract**
Whereas policymakers and educators underline the importance of citizenship education, underlying ideas and assumptions about good citizenship often remain unspoken despite the fact that for instance a good behaving citizen in a Western European country during the nineteen fifties cannot be compared to the transparent, sharing citizen in a dystopian novel like *The Circle* by Dave Eggers (2013). Because of the wide range of unspoken conceptions of good citizenship, this theoretical paper will give account to these conceptions and argue that citizenship education has to be critical.
In order to explore this critical aspect of citizenship education, various mainly philosophical notions will be examined. First of all, we will explore Hans Georg Gadamer's (2004) notion of the possibility of the opening up of new horizons, which prevents us from uncritically accepting our contemporary criteria and prejudices and which helps us to evaluate those criteria and prejudices within their own historical horizon. Secondly, Hannah Arendt's thought on (Socratic) thinking (1978) – which finds its dangerous counterpart in Eichmann's thoughtlessness (Arendt 2006) and in totalitarian fear for the activity of thinking and a plurality of perspectives (Arendt 1979) – will be introduced in order to underline the importance of thinking through (also) mainstream assumptions. Furthermore, notions developed by Amartya Sen (2010) and various critical pedagogues regarding social justice will help us understand that citizenship education has to be critical in order to prevent us from uncritically reproducing unbalanced power structures. Therefore, making heard the voices of the oppressed can be considered a major purpose of citizenship education. Finally, the importance of conflict (Appiah 2006) and dissensus (Mouffe 2013) will be explored to understand why citizenship education cannot do without making heard the voices of minorities having contrasting and conflicting opinions (compared to the majority).
This theoretical paper contributes to existing discussions on critical citizenship education within the RDC Education for Social Justice, Equity and Diversity.

**Keywords:** Critical Citizenship Education; Social Justice; Philosophy

## Introduction

In 1981, Raymond Carver published his nowadays famous collection of short stories *What we talk about when we talk about love*. In the final story of this collection, which is the title story as well, two befriended couples debate the nature of love, only to find that their ideas are wildly different: instead of love, they seem to be talking about all different kinds of things like jealousy, misunderstanding, and pain. At a certain point, one of the characters named Mel – the man who does most of the talking – questions what they all talk about now that they talk about love, adding that "it ought to make us feel ashamed when we talk like we know what we're talking about when we talk about love" (Carver 1981, 146).[1]
Difficulties like these arise as well when we talk about citizenship or citizenship education: we talk like we know what we're talking about when we talk about citizenship, but do we? Whereas policymakers and educators underline the importance of citizenship education, underlying ideas and assumptions about good citizenship often remain unspoken despite of the fact that these assumptions can vary considerably.

[1] Nathan Englander's story *What we talk about when we talk about Anne Frank* (2012) with its morbid Anne Frank game in which two Jewish couples debate who would hide them during an imaginary second Holocaust, will be left aside.

To illustrate this variation in underlying ideas on good citizenship, we compare two very different types of texts containing completely different assumptions of the good citizen.
First, the collected guidance from government, civics and scouting handbooks of the 1920s till the 1960s named *The Good Citizen's Handbook*, opens as follows:

> "A GOOD CITIZEN is well-groomed and fun to be around. She's trustworthy, helpful, courteous, and kind. He's loyal, thrifty, clean and brave. Good Citizens beware delinquency and obey even minor laws. They tend their yards, brush their teeth in a circular motion, vote in every election, and always try their best." (McKnight-Trontz 2001, 6)[2]

With his or her proper behaviour, McKnight-Trontz's good citizen ensures the prosperity of his or her family, community and country.
A completely different talk about citizenship can be found in Dave Eggers' dystopian novel *The Circle*, presenting a terrible, completely transparent world dominated by a private internet and social media company named The Circle. The mission of the people working at The Circle is to improve the world by making it transparent and by sharing all human experiences:

> "'…[W]e're obligated, as humans, to share what we see and know. And that all knowledge must be democratically accessible. (…)' 'So what happens if I deprive anyone or everyone of something I know? Aren't I stealing from my fellow humans?'" (Eggers 2013, 302-303).

The company's adage "Secrets are Lies – Sharing is Caring – Privacy is Theft" (Eggers 2013, 303) asserts that the good citizen shares everything with everyone, follows everyone, replies to all shared messages and thereby lives under complete control of this private company.
So what is it we talk about when we talk about citizenship or citizenship education? Because of the wide range of unspoken conceptions of good citizenship, this theoretical paper will argue that citizenship education has to be critical. In order to explore the critical aspect of citizenship education, various mainly philosophical notions will be examined. First of all, Hans Georg Gadamer's (2004) notion of the possibility of the opening up of new horizons will be explored. Secondly, Hannah Arendt's thought on (Socratic) thinking will be introduced, including its dangerous counterpart of thoughtlessness. Furthermore, notions developed by Amartya Sen and various critical pedagogues regarding social justice will help us understand that citizenship education has to be critical in order to prevent us from uncritically reproducing unbalanced power structures. Finally, the importance of conflict (Appiah 2006) and dissensus (Mouffe 2013) will be explored to understand why citizenship education cannot do without making heard the voices of minorities having contrasting and conflicting opinions (compared to the majority).

**Critical Citizenship Education: Changing Horizons**

Taking a firm standpoint against 19th century historicism with its trust in people's ability to disregard themselves, Hans Georg Gadamer argues that "real historical thinking must take account of its own historicity" (Gadamer 2004, 299). He considers standing outside history and having objective knowledge of the situation an impossibility: we cannot take ourselves away from history in order to understand it properly (and that is: objectively). To Gadamer, the interpreter belongs to the history or tradition he interprets; and understanding itself "is, essentially, a historically effected event." (Gadamer 2004, 299).[3]

[2] Whereas this handbook might be considered as a parody on being a well-behaved and obedient citizen, reviewers from Canada and America take it very seriously praising it for "the refocusing of our moral compass" (Middleton 2001), and being a "remind[er] of our responsibilities to one another by valuing our reputation and being the example we wish to see, or as McKnight-Trontz puts it, 'Good citizenship starts with you!'" (Lichtman 2008).
[3] In German: *ein wirkungsgeschichlicher Vorgang*.

In this sphere of understanding as a historically effected event, Gadamer brings up the concept of horizons:

> "The horizon is the range of vision that includes everything that can be seen from a particular vantage point" (Gadamer 2004, 301).

Whereas we can speak of narrowness of horizon, of the possible expansion of horizon, of the opening up of new horizons, and so forth, it's important to stress that there is no such thing as a *closed* horizon that is supposed to enclose a culture or a set of ideas and beliefs:

> "The horizon is, rather, something into which we move and that moves with us. Horizons change for a person who is moving." (Gadamer 2004, 303)

Our horizon can move when we encounter new horizons, meeting other people with their own standpoints and horizons, understanding their ideas without necessarily having to agree with them.
Critical citizenship education encourages students to become people on the move, with changing horizons, meeting people with different ideas and trying to understand them. Not just because it's fun to move around (that as well!), but mainly to prevent us from narrowness of horizons and uncritically following ideas based on historically determined assumptions of for instance the good citizen.

**Critical Citizenship Education: Critical Like Socrates**

Responding to the catastrophes of the 20th century, Arendt includes the concept of (critical) thinking in her works and essays that constitute her contribution to a new framework of political thought. Whereas the Attorney General Hausner referred to the German Nazi *SS-Obersturmbannführer* (lieutenant colonel) Adolf Eichmann as "the monster responsible for all this" (Arendt 2006, 8) during Eichmann's trial in 1961, Arendt was agonized over his thoughtlessness:

> "The longer one listened to him, the more obvious it became that his inability to speak was closely connected with an inability to *think*, namely to think from the standpoint of somebody else" (Arendt 2006, 49).

The term 'banality of evil' she coined for this total lack of imagination, gave rise to many perplexities and controversies. Reflecting on a story by Ernst Jünger, Arendt clarifies her interpretation of this word 'banality'. In Jünger's story, a peasant who had taken in starving Russian prisoners of war during the Second World War, considered the Russian prisoners subhuman, like cattle, because they ate the pigs' food. Whereas Arendt continues:

> "You see, there's something outrageously stupid about this story. (…) The man doesn't see that this is just what starving people do, right? And anyone would behave like that. (…) That was what I actually meant by banality. (…) There's simply the reluctance ever to imagine what the other person is experiencing, right?" (Arendt 2013, 48)

Therefore, the thoughtlessness Arendt witnessed during Eichmann's trial can be defined as this hesitancy or inability to think from a perspective different than one's own (cf. Berkowitz 2014). With all the horrifying consequences that this entails.

Whereas Arendt considered Eichmann hesitant or unable to think from different viewpoints, she regards totalitarian regimes as ideological enemies of this thinking from multiple perspectives because of their striving for the total destruction of human plurality. Totalitarian regimes presuppose "someone in command who thinks and wills, and then imposes his thought and will on a thought- and will-deprived group – be it by persuasion, authority, or violence" (Arendt 1979, 325). This assumed power

of the leader to impose what is supposed to be 'thought' on the people, entails that the people living in this totalitarian state are regarded a danger to the system itself:

> "Simply because of their capacity to think, human beings are suspects by definition, and this suspicion cannot be diverted by exemplary behaviour for the human capacity to think is also the capacity to change one's mind" (Arendt 1979, 430).

For this reason, a totalitarian regime will do anything to destroy human freedom, the ability to move around, and the capacity to make new beginnings[4] by creating an "iron band of terror, which destroys the plurality of men and makes out of many the One who unfailingly will act as though he himself were part of the course of history or nature" (Arendt 1979, 466). Consequently, Arendt considers totalitarian ideology and the activity of thinking as opposites:

> "[I]deology demands assent, is founded on certainty, and determines our behaviours within fixed horizons of expectation; thinking, on the other hand, requires dissent, dwells in uncertainty and expands our horizons by acknowledging our agency" (Nixon, 2015).

Whereas Eichmann's thoughtlessness and the destruction of pluralistic viewpoints in totalitarian regimes can be regarded as counterparts of the Arendtian concept of thinking, Arendt drew positive inspiration from Socrates, who discovered the two-in-one as the essence of thinking. Having been in a dialogue with others, Socrates returns home where he is not alone but *by* himself, questioning his unexamined opinions.

> "It is this *duality* of myself with myself that makes thinking a true activity, in which I am both the one who asks and the one who answers. Thinking can become dialectical and critical because it goes through this questioning and answering process (…)" (Arendt 1978, 185).

In thought I can contradict myself because in thought I am two-in-one; I live in the condition of plurality. This condition of plurality in thought implies that, to a certain extent, I question myself from the perspective of 'others'.
This activity of thinking cannot be considered a luxurious, passive, or academic pastime. On the contrary, a life without thinking is not fully alive and even dangerous: "unthinking men are like sleepwalkers" (Arendt 1978, 191), holding to the *possession* of whatever prescribed set of rules instead of critically examining the content of the rules. For this reason, critical citizenship education wants to prevent people from this state of non-thinking sleepwalkers and aims to challenge students to question themselves and the world they live in from the perspective of 'others'.

**Critical Citizenship Education: For the Sake of Social Justice**

This critically thinking through yourself and the world you live in, also entails questions on social justice and systemic inequities. To Amartya Sen, the question of social justice can never be an abstract or academic question aiming at the characterization of perfectly just societies, but it can serve as the basis of practical reasoning including "ways of judging how to reduce injustice and advance justice" (Sen 2010, ix). Since differing or even conflicting opinions might emerge toward the (in)justice of concrete situations or events, advancing justice requires a form of public reasoning which takes into account voices and views from 'elsewhere'. To Sen, taking note of these different viewpoints from elsewhere is indispensable due to people's positionality and the need to transcend the limitations of these positional perspectives. Sen's idea of positionality is closely comparable to Gadamer's concept of horizons:

[4] Because of this destructive and dehumanizing power of totalitarianism, *The Origins of Totalitarianism* can be regarded as the negative version or counterpart of *The Human Condition* (1998), a study in which Arendt seeks to formulate an answer to the question what is required to preserve a human and stable world.

> "What we can see is not independent of where we stand in relation to what we are trying to see. And this in turn can influence our beliefs, understanding and decisions" (Sen 2010, 155-156).

Illustrating the difficulty of achieving a positionally unbiased comprehension, Sen describes a society with a long-established tradition of relegating women to a subordinate position, in which, as a consequence, women are not encouraged to study, leading to a paucity of women scientists:

> "The observation that there are few women scientists in a particular society may not be at all mistaken, even when the conclusion that women are no good at science – when drawn from that positional observation – would be entirely erroneous" (Sen 2010, 162).

The independence of mind required to go beyond this positionality of local observations can be enhanced by making heard the voices of a plurality of people having different local positionalities and by taking those voices seriously in public reasoning.
To a certain extent, Sen's idea that many social injustices remain as a result of positional perspectives can also be found in the work of critical thinkers and pedagogues like DuBois, Freire, Giroux, Green, Apple and McLaren, who emphasize the systemic and power related aspects explicitly:

> "Over the decades, critical educational theorists have tried to fathom how schools are implicated in the process of *social reproduction*. In other words, they have attempted to explore how schools *perpetuate or reproduce the social relationships and attitudes needed to sustain the existing dominant economic and class relations of the larger society*" (McLaren 2009, 77).

Critical pedagogues acknowledge that existing unequal power relations in society and between participants in educational processes are often based on membership in social groups and supported by societal structures. Instead of considering these inequities as "isolated events of individuals or deficiencies of the social structure", they regard inequities as a "part of the *interactive context* between individual and society" (McLaren 2009, 61). This more dialectical approach of the critical pedagogy

> "enables the educational researcher to see the school not simply as an arena of indoctrination or socialization or a site of instruction, but also as a cultural terrain that promotes student empowerment and self-transformation" (McLaren 2009, 62).

Critical citizenship education recognizes the danger of reproducing inequitable and unjust structures in societal and educational settings, especially when the character of these structures is neglected due to positionally dependent observations. Therefore, critical citizenship education aims to establish awareness of biases within constructed content knowledge taught in schools (Apple 2014; Banks 1993, 2008) and of biases within societal and educational settings in general (Freire 2000; Cochran-Smith 2004). Examples of this in various practitioner research studies emphasize the importance of making heard the voices of those not in power in order to raise awareness of socio-economic disadvantages (Jones 2016) and biases within constructed knowledge (Leijgraaf 2014).

**Critical Citizenship Education: Space for Dissensus**

Making heard the voices of a plurality of people holding different positions within various societies also implies the need to accept that a plurality of even conflicting reasons may play a role in people's judgments. As Kwame Anthony Appiah points out, conversation between people from different ways of life is inevitable but should not be accompanied by the expectation of reaching consensus:

> "People are different (…) and there is much to learn from our differences. Because there are so many human possibilities worth exploring, we neither expect nor desire that every person or every society should converge on a single mode of life" (Appiah 2006, xv).

Notions like dissensus, conflict and adversaries are crucial in Chantal Mouffe's political work on pluralist democracies. According to Mouffe, to banish conflict from our democratic society is both impossible and undesirable as a result of the hegemonic and contingent nature of every kind of social order:

> "Things could always be otherwise and every order is predicated on the exclusion of other possibilities. Any order is always the expression of a particular configuration of power relations. What is at a given moment accepted as the 'natural' order, jointly with the common sense that accompanies it, is the result of sedimented hegemonic practices" (Mouffe 2013, 2).

Since what is considered the 'natural order' lacks an "ultimate rational ground" (Mouffe 2013, 131) but is temporary, precarious and contingent, this 'natural order' is "susceptible to being challenged by counter-hegemonic practices" (Mouffe 2013, 2) that strive to undermine it and install another form of hegemony. Mouffe argues that this challenge should not take the form of an antagonism (a struggle between enemies who want to defeat each other) but of an agonism (a struggle between adversaries who recognize the legitimacy of each other's demands):

> "[T]he aim of democratic politics is to transform *antagonism* into *agonism*. This requires providing channels through which collective passions will be given ways to express themselves over issues, which, while allowing enough possibility for identification, will not construct the opponent as an enemy but as an adversary" (Mouffe 2000, 16).

To deny or try to banish conflict or dissensus by striving for a form of consensus which "deprives democratic citizens of an agonistic debate where they can make their voices heard and choose between real alternatives" (Mouffe 2013, 119), might result in the creation of a breeding ground for violent forms of antagonism:

> "[W]hen institutional channels do not exist for antagonisms to be expressed in an agonistic way, they are likely to explode into violence" (Mouffe 2013, 122).

Therefore, pluralistic democracies have to provide spaces for dissensus, find ways to deal with conflicts instead of ignoring them and minimize the danger that conflicts might take a violent, antagonistic form. However, Mouffe's plea for dissensus does not entail a total banishment of consensus. On the contrary, some form of consensus on the ethico-political principles is needed for a democracy to exist, whereas the interpretation of those principles may vary according to people's different perspectives:

> "[S]ince those ethico-political principles can only exist through many different and conflicting interpretations, such a consensus is bound to be a "conflictual consensus". (Mouffe 2000, 16)

Critical citizenship education seeks to give space to voices, opinions and ideas opposing dominant ideologies and being marginalized by dominant ideologies. Furthermore, it endeavours every participant in the educational process to practice the agonistic struggle "that constitutes the specificity of a pluralist democratic politics" (Mouffe 2013, 139), in which adversaries meet who recognize the legitimacy of the demands and ideas of their opponent.

**The Critical Role of the Arts**

According to Mouffe, artistic practices can make a decisive contribution to giving voice to those being marginalized by dominant ideologies:

> "The agonistic approach sees critical art as constituted by a manifold of artistic practices bringing to the fore the existence of alternatives to the current post-political order. Its critical dimension consists in making visible what the dominant consensus tends to obscure and obliterate, in giving a voice to all those who are silenced within the framework of the existing hegemony" (Mouffe 2013, 92-93).

Because of this 'giving voices to the silenced ones', Chinua Achebe stipulates that process "of 're-storying' peoples who had been knocked silent by the trauma of all kinds of dispossession" (Achebe 2001, 79) continues; a process striving for a "balance of stories among the world's peoples" (ibid.) in which not only the colonizing, Western powers make themselves heard, but the silenced, colonized peoples as well, taking "back their own narrative" (Achebe 2001, 44).

Maybe the most famous Afro-American novel that contributed to "the creation of a multiplicity of sites where the dominant hegemony can be questioned" (Mouffe 2013, 104), making visible the invisibility of marginalized people, is Ralph Ellison's *Invisible Man*, first published in 1952 and opening with the following lines:

> "I am an invisible man. No I am not a spook like those who haunted Edgar Allan Poe; nor am I one of your Hollywood-movie ectoplasms. I am a man of substance, of flash and bone, fiber and liquids – and I might even be said to possess a mind. I am invisible, understand, simply because people refuse to see me. Like the bodiless heads you see sometimes in circus sideshows, it is as though I have been surrounded by mirrors of hard, distorting glass. When they approach me they see only my surroundings, themselves, or figments of their imagination – indeed, everything and anything except me.
>
> Nor is my invisibility exactly a matter of bio-chemical accident to my epidermis. That invisibility to which I refer occurs because of a peculiar disposition of the eyes of those with whom I come in contact. A matter of the construction of their *inner* eyes, those eyes with which they look through their physical eyes upon reality" (Ellison 1982, 3).

These inner eyes have the power to make the protagonist of this book an invisible man, thereby reducing him to a man who was made invisible by the majority and the dominant ideologies.

Along with the critical arts, critical citizenship education aims to criticize imbalances and inequalities, addressing practices in which people are being made unheard and invisible, questioning unexamined assumptions.

To end with the question we started with: what do we talk about when we talk about citizenship? From my point of view, the heart of the issue is being addressed by the question itself: what *do* we talk about? Citizenship and its unspoken assumptions should be questioned over and over again, and as a consequence citizenship education has to be critical. To prevent us from slavishly obeying rules we never examined or discussed, and that could lead to inhumane and unjust practices.

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# High Quality Differentiated – A Checklist for Teacher Professional Development on Handling Differences in the General Education Classroom

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**Abstract**
This paper presents the results of a review study on differentiated instruction. It discusses the way the concept of differentiated instruction may be applied in an evidence-informed way by presenting a checklist for high-quality differentiated instruction (DI). This concept has been developed to handle differences in learning status, interests and learning profiles within a classroom (C. Coubergs, Struyven, Gheyssens, & Engels, 2013; C. Tomlinson, 2000; C. Tomlinson, 2001). Differentiated instruction may be described as a comprehensive concept including a variety of teaching approaches. Both Tomlinson (2000) and Coubergs and Struyven (2015) have tried to define the concept by proposing a model for DI. The comprehensive character of differentiated instruction makes it sensitive to critique as it is rather difficult to state whether DI is an effective classroom practice. Research on effectivity of DI is scarce and focusses on elements of the construct rather than on the construct as a whole (Firmender, Reis, & Sweeny, 2013; Riviou & Kouroupetroglou, 2014; Smit & Humpert, 2012).
We tried to tackle the question of how to implement differentiated instruction in a research-informed way. We sought answers in meta-analyses on effective teaching practices, by using the work of Hattie (Hattie, 2009, 2012), Marzano (Beesley & Apthorp, 2010; Marzano, 1998) and Muijs and Reynolds (Muijs & Reynolds, 2011). In their work they make various references to elements that constitute a defining part of the construct of differentiated instruction. To investigate accordance between this literature and both models for DI, we have operationalized all elements in these models. We scrutinized whether the operational elements in these models are characterized by the afore mentioned authors on teaching effectivity as effective teaching practices. The result is an evidence-informed checklist (Scriven, 2005) that helps teachers who want to apply the concept of DI in their practice.
The need for this evidence-informed checklist is clear as many practices exist of teachers implementing differentiated instruction in a selective or ineffective way. Some authors describe DI as merely an attitude (Van Aevermaet & Sierens, 2011). Our checklist clearly indicates that DI also requires a repertoire teaching methods. Other authors such as Wijnia, Hulsebos, and Hummel (2010) propose differentiated instruction practices that cannot be supported by evidence.
This checklist may help teachers to assess their own teaching practice. It deserves a role in teacher professional development programs. It is not designed as a definitive set of criteria that every kind of differentiated instruction must meet, rather it is a tool to discuss high quality evidence-informed teaching practices that aim at making teaching in diverse classrooms more accessible. It may therefore also be applied by preservice teachers and teacher educators as a tool to discuss the practicum experiences.
We would like to present the checklist for high quality differentiated instruction on the ATEE conference in an interactive way by proposing in our session two examples of differentiated instruction approaches to the public. We will let the attendants discuss in small groups whether they regard the proposed approaches as high quality DI. After this moment of unstructured discussion we scaffold the discussion by presenting the checklist and ask the attendants to write down suggestions to improve the presented examples based of the checklist criteria. To summarize the discussion we present our own estimate of the approaches and we formulate our own suggestions for improvement. In a more extended way this paper may also be elaborated as a workshop.
This paper is relevant for the conference theme of innovation. The checklist presents a tool for high quality DI for teachers, teacher educators and preservice teachers that want to innovate their own teaching in a thoughtful evidence-informed way.

**Introduction**

As diversity in many European countries increases, the need for educational innovation increases concurrently. Diversity in schools is not only a cultural diversity that has roots in historical and recent migrations, it also may be presented as a pedagogical diversity in terms of differences in readiness level, interests or learning profiles. Diversity challenges teachers to take this diversity as a starting point from which any educational process must take off.

Education in diversity is now one of the priorities of educational policymakers (Raitano & Vona, 2013; Schleicher, 2013). Teachers are supposed to provide educational opportunities for a variety of different learners in their classrooms. In Flanders this is supposed to be an elementary teacher competence (Vandenbroecke, 2007).

Reality is often different. Many teachers regard the ambition to provide inclusive teaching opportunities for a variety of students as a difficult task. Many teachers don't know how to adapt their teaching habits to the new demographic reality. They often feel a lack of support and find it sometimes hard to imagine how a differentiated classroom could work (De Neve & Devos, 2016; Smets, 2016).

Different approaches are proposed to handle differences in the classroom and thus to provide inclusive educational opportunities for a wide variety of learners. Tomlinson ( Tomlinson, 2000; 2001) proposed the concept of differentiated instruction as a framework that included a variety of teaching strategies and methods aiming at maximizing learning profit for all learners in a classroom. The concept of differentiated instruction has until now not been going through academic effectivity research. This is probably due to the difficulty of developing a research design that is suitable for analyzing a such a broad teaching concept.

The aim of this study is to bridge the gap between academic research on teaching effectivity and practice-based research on differentiated instruction. Through a comparison an evidence-informed (Zwozdiak-Myers, 2012) checklist that supports teachers when they are innovation their teaching habits is introduced.

**Method**

A checklist-methodology was chosen based on Scriven's recommendations for research dissemination (2005). The checklist that is proposed in this study is based upon a comparison of academic and practice-oriented research. A lot of practice-oriented research has been conducted by researchers of the ASCD. The most well-known expert in the field is Tomlinson who has published extensively on the topic (Tomlinson, 2000; Tomlinson, 2001; Tomlinson et al., 2003). In Belgium, where this study was conducted, the largest research expertise on the matter is centered at the university of Brussels were Struyven and Coubergs have built up substantial experience (Coubergs, Struyven, Gheyssens, & Engels, 2013; Coubergs, Struyven, Gheyssens, & Engels, 2015; Struyven, Coubergs, Gheyssens, Engels, & Smets, 2016). The research for the checklist high quality differentiated instruction started from two models for differentiated instruction that were developed by each of these experts (Coubergs et al., 2015; Tomlinson, 2000).

***Operational Characteristics of Differentiated Instruction***

Both models were analyzed and summarized into a set of eight operational characteristics. The characteristics of the model of Coubergs et al. (2015) is a translation of the author of the original Dutch version.

| **Tomlinson** | **Coubergs & Struyven** | **Operational characteristics** | |
|---|---|---|---|
| Teacher's response to learner's needs | Handling differences in the classroom | Teacher reacts to different student characteristics depending on student's needs. | A |
| Adapting to students readiness, interests, learning profile | Interest, learning profile, learning status: aiming at maximizing learning | Teacher adapts to differences in learning status, interest and/or learning profile aiming at maximizing learning. | B |
| Respectful tasks | | Teacher adopts respectful attitude towards students. | C |
| | Teacher philosophy: growth mindset & ethical compass towards student | Teacher acts following principles of growth mindset<br>Teacher's ethical compass is directed towards students | D |
| | Positive, proactive, planned | Teachers handles differences in a positive, proactive and planned way | E |
| Differentiation of content, process or product | | Teacher makes adaptations to content, process and product | F |
| Flexible grouping | Flexible grouping | Teacher uses flexible grouping | G |
| Ongoing assessment and adjustment | Input = output | Teacher gathers continuously information<br>Teacher adapts lessons based on this information | H |
| Range of instructional and management strategies | | Teacher uses a range of instructional methods and organizational strategies. | I |

*Table 1: set of operational characteristics of differentiated instruction.*

***High Quality Teaching***

A selection of works on effective teaching was consulted in order to analyze whether all of these operational elements can be regarded as high quality teaching. The three selected works are to be seen as expert-references in the field (Hattie, 2009; Marzano, 1998; Muijs & Reynolds, 2011). The choice to work with these generalist summaries for effective teaching is argued on the fact that teachers in practice also have to make these choices, and on the fact that many teachers use these works as a reference. Teachers have in their everyday-practice no time to discuss particular details of effective teaching but need generalist advice on what works in classrooms.

Assuming that these meta-analyses provide a relevant overview of educational research, they were used as a reference to scrutinize the operational characteristics proposed in 2.1. A thematic analysis was made of the elements in these works that relate to the operational characteristics mentioned in table 1. Details of the analysis are published in Dutch in a research report that is available on the university college's website (Smets & Sas, 2016). The results of the thematic analysis are clustered in a checklist (Scriven, 2005) as presented below.

**Results**

The comparison of practice-oriented expertise of Tomlinson on the one hand, and Coubergs and Struyven on the other hand with international literature on teaching effectivity resulted in three sets of characteristics of high quality differentiated instruction. These characteristics are more specified than the operational elements we found in the models of Tomlinson and Coubergs & Struyven. In this section each of the sets is shortly explained.

***The Teacher and His/Her Students***

The teacher stands in close relation with his/her students. Opportunities to discuss with students about their learning are offered. This implies that the teacher cannot be continuously talking and that questions are equally distributed between the teacher and the students. By considering social relationships between students the teacher creates a safe climate where learning is possible for anyone. In this climate failure is possible and even encouraged as it proves that a student is giving effort to leave the proper zone of comfort. The teacher gathers assessment data in order to integrate them in the student's learning process. The teacher does not let himself be guided by labels, but uses information on the student as a start of a learning process. Fundamental is a growth mindset towards students' learning possibilities. By setting high, but not necessarily equal, expectations the teacher helps them to set high expectations for themselves.

| **Criteria: The teacher in relation to his/her students**<br>**The teacher…** |
|---|
| Shows interest for the students and relates to them with regard to their learning |
| Installs a classroom culture where failure is possible |
| Has high expectations for all students and help them surpass themselves |
| Has a well-balanced view on students with knowledge of personal characteristics and without one-dimensional stereotyping |
| Considers learning attitude and habits of students, and helps improving these |

***The Teacher and the Learning Goals***

The teacher is well aware of the goals he/she pursuits. He/she understands the levels of and interconnectedness between learning goals and has insight in how learning goals can be attained trough different learning paths. In structuring learning goals to complexity the teacher creates challenges that fit with students personal readiness level. By clearly stating the desired level of competence at the end of the learning process, and by formulating intermediary goals the teacher specifies for students what is expected. During the learning process the teacher provides ongoing formative assessment in order to give students insight was has and what has not been learned yet. This formative assessment provides students with insight in the proper learning path, and creates for the teacher the opportunity to adapt his/her lessons to it. The assessment data are thus not only an assessment of learning but also an assessment for learning.

| **Criteria: The teacher and the learning goals**<br>**The teacher…** |
|---|
| Understands learning goals and know how to structure them towards complexity |
| Provides students with insight the learning path to follow |
| Provides students with feedback of what has been learned, and feedup for what still needs to be learned |
| Gathers assessment data on what has been learned, and uses this in the future teaching design. |

***The Teacher and the Lesson Design***

At the start of a learning process a teacher always builds on what students already know and can. Study materials are thus never entirely new. Thanks to a rich set of teaching strategies the teacher is capable of meeting students' diverging educational needs. The choice of teaching strategies is always based upon maximizing learning outcome for all students in the class. Hence they are always adapted to where students are in the learning process. By adapting to students' interests, learning profiles and readiness levels the teachers makes sure that anyone's learning process is enriched. Where necessary or useful temporary homogeneous or heterogeneous collaborative learning groups are created to provide tailor-made instruction or learning materials.

| **Criteria: The teacher and the lesson design**<br>**The teacher…** |
|---|
| Builds on existing knowledge, skills and attitudes |
| Uses a diversity of different teaching strategies |
| Adapts the teaching strategy depending on where students are in the learning process |
| Uses flexible grouping depending on students interest, learning profile and learning status |

**Discussion**

***High Quality Differentiated Instruction***

Teachers that implement differentiated instruction in their classroom may use the models that were used in this study. Almost all of the elements in these models are explicitly or implicitly mentioned by authors of international effectivity research as elements of good or effective teaching. It may be concluded that the framework of differentiated instruction can be a helpful guidance for teachers that want to address differences in the classroom and at the same time want to bridge the gap between research and practice in this field.

The operational elements under scrutiny in this study resulted in a selection of checklist-criteria for high quality differentiated instruction. Some of them show important overlap with good teaching in general. In particular the elements of the first set of criteria that concern the relationship of the teacher with his or her students.

Two elements deserve more specific comment as research is not entirely clear on how to bring them into practice. These elements are the aspect of flexible grouping and the aspect of considering learning styles.

***Flexible Grouping***

Experts on differentiated instruction promote the use of flexible grouping techniques. These techniques are in particular relevant with all kinds of cooperative learning activities. Flexible grouping permits teachers to accept different interests and different readiness levels in the same classroom as an opportunity rather than as a problem. Flexible grouping may also encompass using temporary homogeneous grouping. Research however is often negative on the possibility of homogeneous grouping. Both Hattie (2009) and Muijs and Reynolds (2011) are arguing against it.

It remains doubtful whether the contexts in which research warning against homogeneous grouping is an appropriate way to make statements on homogeneous grouping in differentiated instruction. It seems for instance not sure whether homogeneous grouping based on interests is really problematic. Still it emerges that homogeneous grouping based on readiness levels may be problematic as a result of decreasing students self-efficacy and teachers expectations. Particularly if this kind of grouping is often practiced. These effects are important effects to consider for teachers that want to implement differentiated instruction.

***Learning Styles***

Much discussion has been made over de last few years on the matter of learning styles. This discussion must not be overdone here. However it is clear that the topic has been labelled problematic by many theorists, and that still a lot of practitioners see a substantial added value of different theories on learning styles.

With regard to differentiated instruction the question must here be whether teaching time sacrificed to framing a student's learning style is really spent effectively. Given the problematic character of learning styles I think it would not be advisable to lose much time on this topic. However some of the learning style models may help students to enhance their self-knowledge and could in this way provide some added value.

Another question is whether it makes sense to direct students assignments on a prior analysis of his or her learning style. Given the problematic character this topic the answer would be easily negative. Moreover, based on principles of self-determination it may be argued that students in a differentiated classroom should be provided with a maximum of choice to stimulate students autonomy, and therefore also motivation. If this integration of choice would encompass differences in learning styles where students are allowed to make choices depending on their own preferences probably no harm would be done.

**Implications for Teacher Education**

The introduction of differentiated instruction is often a long and difficult process that requires a lot of time (Smets, 2016; Smit & Humpert, 2012). As a consequence it is not easy to prepare teacher education students for this difficult task. Teacher education is by consequence challenged to adapt its curriculum in order to prepared its students adequately for dealing with diversity in the classroom, and in particular for implementing differentiated instruction in their practice.

Many beginning teachers find differentiated instruction a difficult task to fulfill (De Neve & Devos, 2016). As a result of that teachers ask for support when they start introducing differentiated instruction (Smets, 2016). The aim of the checklist that is presented in this article is to support pre-service and in-service in this difficult task. It may serve as a document for personal or collective reflections of teams of in-service teachers and teacher students.

**Conclusion**

Differentiated instruction is a construct that enables teachers to integrate differences amongst the students in their classroom into everyday teaching practice. Most of the experts' recommendations are grounded in research on teaching effectivity. However, the implementation of differentiated instruction needs careful consideration as some concepts may be problematic. In particular the use of homogeneous ability grouping may be sometimes counterintuitive. The use of learning styles is even more problematic. All other operational elements in the models under scrutiny in this study are accepted as elements of effective teaching, a checklist was developed for teachers who want to implement differentiated instruction in a high quality teaching environment.

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# Teacher Educator as a Broker: The Partnerships among Local Universities to Educate Future Teachers

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**Abstract**
In education, teachers are human beings who bring something new to an educational situation to support individual students so that they can live better tomorrow. But what then is the role of the teacher educator? Currently, a variety of roles for teacher educators have been proposed: teacher of teachers, researchers, coaches, facilitators, practitioners, gate keepers, curriculum developers, etc. I dare to say that, as a teacher educator at a local small university, the role of broker, serving to connect individuals and groups of pre-service teachers to others, is crucial in order to share new things with learners. Collaboration and partnerships with other institutions and organisations have been a top priority in recent years.
It is often said that Japanese university students have a lower sense of self-esteem than those in other countries. In particular, students at local small universities, usually placed in the bottom of the school hierarchy, suffer from lower self-esteem. Their self-esteem has been deprived in the school culture. Deprived self-esteem should be restored through interactions with others. Their individual development both as a human being and a teacher through encountering, having dialogues with, connecting with others, especially others about the same age is extremely necessary. Students do not have strong enough academic backgrounds, although they surely have their own core quality (in another word, strength) (Korthagen et al. 2013) as a teacher. Since academic abilities and sense of self-efficacy are co-related, their academic backgrounds will develop as well.
In 2009, two local and small sized universities started a mock lesson meeting together. This February, the 6th conference was held. Students from thirteen universities participated in the conference, created study lessons and discussed their lesson purposes, lesson flows, evaluation criteria, plans of writing on blackboards and so on. This conference stimulates future teachers to conduct autonomous reflection. This paper presents the outline of partnerships with the teacher education programme of AU University and then examines the learning outcomes of these mock lesson meetings.

**Keywords:** Pre-service teacher education, collaborations, cooperation and partnerships, teacher education programmes of local small universities

## Introduction

Collaboration/cooperation is essential in teacher education, as highlighted by the main theme of the 2015 annual conference of Association for Teacher Education in Europe [ATEE]: 'Teacher Education through Partnerships and Collaborative Learning Communities'. However, this is often difficult, and sometimes impossible. Particularly, local small universities face problems even finding another party to collaborate with. Before I turn to the main theme of this paper, readers should be familiar with the main principles of teacher education in Japan.
There have been two major principles in Japanese teacher education: university based teacher education[5] and open system for teaching certificate[6]. The latter principle is more closely linked with the theme of this paper. School teachers and society have generally distrusted teacher education at

[5] There are three kinds of teaching certificates: Premier (Master's), 1st class (Bachelor's), 2nd class (Associate's). However, there is no difference in professional duties.
[6] Students get certified studying not only at 47 national universities (former normal schools) but also teacher education programmes (with a certain number of extra credits) and 800+ other national/public/private universities which are approved as teacher education institutions by MEXT.

universities[7]. However, 800 plus private, public and national universities/junior colleges including 47 formal normal schools, have teacher education programmes through which students can obtain their teaching certificates. Many of these are for secondary school level. In 2014, according to the Ministry of Education, Culture, Sports, and Technology (MEXT), 117,629 secondary level teaching certificates were issued while there were only 492,308 in-service teachers in secondary school education (MEXT 2015). Many of those who are certified do not choose teaching as their profession, making the teaching job less attractive[8]. Combining an open system of teacher education with tough working conditions of Japanese teachers, student teaching is regarded as 'pollution'. Particularly, student teachers from local small universities are regarded as those taking teaching certificate as their memento of their college days.

Thus it is crucial to consider how local small universities support their students seeking a career as a teaching professional. In this paper, I will report on partnerships with the teacher education programme of AU University[9], especially among teacher education programmes of local small universities and examine the results of a mock lesson meeting held annually since 2009.

**The Role of Teacher Educator at AU University: A Broker**

AU University is a local small university, located in the city centre of a depopulated area in the northern part of Japan. In 2016, it had 723 students in total and 35 students enrolled in the teacher education programme. Every year, a couple of students start their career as a non-tenured teacher, who later become tenured only if they pass the employment examination of teachers. Academic advisor A of AU University, one of the founders of this conference, has perceptions about pre-service teachers are as follows:

- They have a lack of [serious] interactive experiences with others, and have lost their sense of self-efficacy.
- They are focussed on the learner/customer and teacher/provider approach.
- Although they do not recognise it, they have their own 'core qualities' (Korthagen, Kim, and Greene 2013).

As a teacher educator, how to support these students' development both professionally and individually through 'communication' (Dewey 1916/2004) is the most critical issue. As shown in Figure 1, it is necessary for them to experience this cycle of learning in order to step out from their small world.

Characteristics of teacher educators are developed and classified as follows (Lunenberg, Dengerink, and Korthagen 2014): teacher of teacher, researcher, coach, curriculum developer, gate keeper, broker. All six categories are important for teacher educators. They do their job in a variety of social contexts, so if academic advisor A should choose this role, it would be a broker as teacher of teachers. More precisely, the most influential identity is the first description: teacher of teachers. The mission as a teacher of teachers is to support future teachers to develop their sense of respect for students with different backgrounds. Prospective teachers also frequently give a one-sided view on matters they are not familiar with and many times are disrespectful to others. Thus, his role should promote prospective teachers to encounter a variety of people and experiences, and as a result, he chooses his characteristic as a broker as a teacher of teachers.

[7] There are many problems in teacher education of higher education, but the biggest one would be lack of common understanding among professors that teacher education programmes have to support professional development of future teachers.

[8] As shown in the 2013 Teaching and Learning International Survey (TALIS), working hours of Japanese teachers are the longest in the world (MEXT 2014).

[9] AU University is a pseudonym.

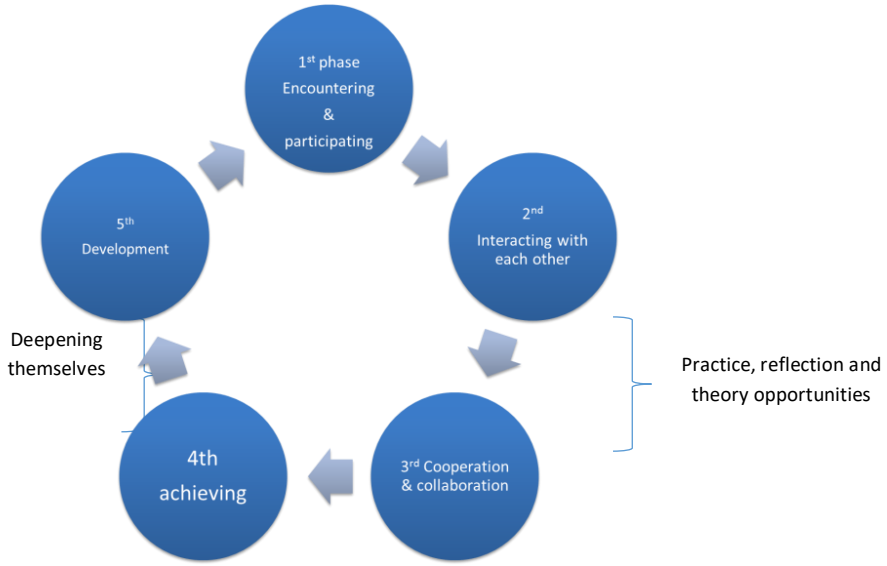


*Figure 1. Spiral learning for empowerment*

The teacher education programme of AU University has several partnerships with other organisations: Board of Education of the prefecture, Board of Education of the city, Board of Education of a nearby town, school-university partnership with local schools, other local small universities. The goals of the partnerships are: to develop students' learning and to contribute to local communities[10]. In order for these partnerships to become meaningful both for students and local communities, long term relationships, connecting needs and goals of every participant, and safe environment are highly regarded. In addition, it is possible to have other partnerships with NPO/citizen groups and other professionals like nurses, social workers, counsellors, private companies, and student groups.

**Mock Lesson Meeting with Other Local Small universities**

Mock lesson meeting is when students from a variety of universities get together and share their lessons with each other. Students except for those with teacher roles take elementary and secondary school student roles in accordance with the mock lessons they participate in. A couple of students take leadership roles and become a facilitator after lesson conferences. After the conferences, students put their opinions, ideas and remarks on worksheets and hand them out to the student in charge of lessons. They are used by students who provided the lesson in order to reflect and improve it. This mock lesson was first held in 2009 and since then it has been held annually[11], six times (see Table 2 for more details).

[10] While the partnership with local governments is crucially important, it could be said, in other words, students take over governments' responsibilities. This situation is closely connected to governments' financial and human deficits. Students are not of course subcontractors of the government. Therefore, perhaps, it is very crucial that students' learning should be centre.

[11] In the 2013 school year, the meeting was scheduled on Feb. 2014 at B University. However, due to a heavy snow storm, it was canceled.

| | date | Number of participating universities |
|---|---|---|
| 1st | 12. 12. 2009 | 4 |
| 2nd | 22. 1. 2011 | 6 |
| 3rd | 15. 12. 2012 | 7 |
| 4th | 17. 2. 2014 | 8 |
| 5th | 21. 2. 2015 | 9 |
| 6th | 13. 2. 2016 | 15 |

*Table 2. Mock lesson meeting: history*[12]

The purposes of the mock lesson meeting are as follows:

1. An opportunity to experience improving lesson skills.
2. An opportunity to exchange ideas and to cultivate learning as a future teacher.
3. An opportunity to foster more profound perception of education and becoming a teacher.

Students of local small universities often have a lack of opportunities to reflect on their lessons with a variety of perspectives from others. The key goal of this project is that students learn by interacting with other students from different majors. For six years, participants with a variety of majors get together. Most of the participants were majoring in: business management, economics, education, humanities, human life science, law, psychology, primary education, systems and informatics, and social welfare.

**Research Method**

I employed inquiry-oriented approaches as in other this type of researches. Data was gathered from observations, reflective journals/reports, e-mails, individual conversations, face to face/telephone interviews, group discussions, and post-teaching/observation group discussions. Research participants were chosen among those who had participated in this meeting actively. Interviews and discussions were all recorded. Data on students' learning from first to fifth meeting were analysed by three teacher educators including the author while data on students' learning from the sixth meeting and on learning of academic advisors were analysed by the author only. However, all of the interviewees were provided opportunities to see and correct the manuscript.

**Students' Learning**

The students' learning can be summarised in the following five items (Saito, Kikuchi, and Matsuda 2015, 82-84):

1. Cultivating the perception of a teacher (mission, identity and belief as a future teacher).
2. Cultivating the perception of teaching (importance of lesson theme, difference between knowing and understanding, in line with students' development).
3. Upgrading skills (how to ask a question, lead students to cultivate their ideas with questions, write on the blackboard, utilise handouts and worksheets etc…).
4. Fostering their awareness about other subjects and other school categories (primary ⇔ secondary, e.g., active learning or content based?).
5. Awareness of link between educational theories and practices.

For example, student A from AU University, who became a social studies teacher at the secondary level, participated in the meeting by taking on the role of teacher[13] when he was a junior. His motive to become a teacher was the respect he felt towards his friend of his junior college who explains his knowledge so skilfully that he desired to become like him. So, his perception of a lesson was to deliver

[12] In the 2011 school year, this meeting was canceled due to a heavy snow storm.

[13] Students from AU University have participated in the meeting as a seminar activity and they are asked to prepare a lesson (lessons) as a group.

the subject matter knowledge tactfully. More precisely, teaching was just delivering pieces of knowledge and students should learn by rote, which was rather simple and perhaps no proper lesson theme was needed. This simple perception of a lesson had been developed through his preparation with his fellow students and his participation in the mock lesson at the conference.

First of all, he became more aware of the importance of a lesson theme when preparing lessons. He had been taught that the lesson theme was very important many times in every course in the teacher education programme, such as pedagogy of social studies course. However, he was not aware of the importance of the lesson theme, given his perception of a lesson. One day, when he was participating in a mock lesson, in collaboration with his peers, he first recognised that the lesson theme was really important. In the introduction part of the lesson, he asked a question, and wrote down every answer his peers provided. The introduction part lasted over ten minutes. One peer student said, 'Wait! Is it necessary to write down all the answers?' At this time, he wrote down all the answers, many of which were not important to the lesson context, and it was really time consuming. He was anxious about running out of time. For the first time, he understood that the written content on blackboards should be linked with lesson themes, and without concrete lesson themes, he would face problems even when writing students' answers on a blackboard. In addition, he later understood his questions were not developed enough because of shallow lesson themes, so even his peers did not understand his question. He imagined how this would play out had he actually been teaching junior high students rather than a group of his peers.

Second, he became aware of the difference between knowing and understanding. He had first thought he could explain social events well because he knew them. However, during mock teaching, he could not explain them well enough. Many times he was at a loss for words. Some of his peers, especially those who did not enrol in the teacher education programme, did not understand his explanations. Even when he thought his explanations were clear, they told him after the conference that they did not understand what he presented. Specifically, he did not understand the learning process of social studies: knowing, understanding, exploring, value judgements, actions as a citizen.

Third, he became aware of himself as someone who easily gives up when trying to understand others. He recognised that when he encountered an individual that did not get along with him, that he stopped paying attention to them and did not take them seriously. After the mock lesson meeting, a student at another university, who was becoming an elementary school teacher, reflected on her own lesson that, although peers did not raise their hands actively, if they had been elementary school students, they would have participated more actively. Student A reflected on his own student teaching at high school in the latter half of his junior year. There were many students who did not seem interested in his lessons. He was really nervous, and delivered the subject matter in a one-sided manner. He had given up trying to discern how the students felt. He remembered that he had been taught in the pedagogy of social studies course that without understanding students, teachers cannot teach. His mentor teacher also asked him frequently, for example, to share social events that were familiar with his students in the introduction part of lessons. Without knowing his students, he was not able to see what events were familiar to his students. He had thought of himself as someone giving lessons without trying to understand his students. Although, in a sense, this was a method to protect himself, as someone who was not self-confident about his lessons; he began thinking about how he should transform himself as a future teacher. He summarised his learning during this period as 'knowing the diversity among people'. For student A, by participating in the mock lesson meeting, he learned: to develop his perception as a teacher [from a delivery man of subject matter knowledge to a facilitator of learning]; to develop his perception of lessons [from a time to memorise subject matter knowledge to a time to become understood and interested in society]; to improve his lesson skills [teachers' questions and blackboard writing are closely linked with the lesson theme]; to connect theory of social studies pedagogy to his practice.

When examining students' learning at the 6$^{th}$ meeting, two more items should be mentioned. Frequently, students' learning does not delve deep into subject matter knowledge. Since many of them are interested in becoming a teacher, their interests are focused on teaching skills such as how to write on blackboards, how to ask a main question among others. However, the story after the 6$^{th}$ meeting

was different. About a week later, four students of AU University had a discussion[14] about after war reparation, which was linked with a lesson topic student B brought up in the 6th meeting. Student B said, "(The Japanese government has apologised in 1993, 1995, 2005, and 2015) it is not necessary to apologise more. There is no reason for their argument (Which is about Japan having not apologised about its military aggressive past)." He added that with multiple perspectives, people should think about this kind problem. Student C said, "This is not a matter of past, but a matter of future. For example, territory disputes should not be solved now. It should be put off, which is a realistic way to solve this dispute." Student D[15] show another perspective that [China, South Korea, and Japan] should set up a new project to share historical views. He mentioned how to focus on the voices of victims should be most crucial. In the end, they did not agree with each other and their discussion continued during the school year.

In addition, it was a good opportunity for some students to network. One student wrote on his worksheet:

> At my university, only a few students enrol in teacher education programmes, and in my class there are only two students. So, I always observe mock lessons of the other student and vice versa. This time, I have participated in this meeting and gained incentives to improve my teaching from students at other universities. In addition, it was a good opportunity for me, as I am from outside of the prefecture, to meet students at other universities. (Association of 6th mock lesson meeting 2016, 21)

His university has a very small number of students who are enrolled in the teacher education programme. He participated in the meeting with other students from the same university. This provided many opportunities to talk with students from universities.

However, since the number of students from AU University participating in the meeting was about twenty, not quite half the participants but they were the largest, there were few comments like this from them. The size of groups participating might have contributed to this. In the 5th meeting for instance, over half of the participants were from AU University. When student D of AU University presented a lesson for about 10 students, only a student from another university joined his lesson. So 'it was overwhelmingly home game' (student E of AU University). The student gave his comment to student D, which was he often mistook writing orders of Kanji letters. The reaction to his comment from student D was, 'It is true, but should I indeed correct it?'[16] Student C of AU University provided a comment that he paid attention to details of the lesson. Student E added that she did not feel perspectives from others were included.

It is not necessary that students from a big group interact with those with other backgrounds.

**Academic Advisors' Learning**

In addition to pre-service teachers, academic advisors also learned. Two academic advisors participated in this research and summarised as follows:

1. Students from a variety of backgrounds help them to learn from each other (especially for pre-service elementary school teachers at junior college).
2. The sense of achievement with their fellow students leads students to have greater self-efficacy, which brings about more professional development.
3. Team building is essential: subject matter knowledge plays a crucial role, and building a safe environment is extremely important. These are all connected to civic education.

[14] This opportunity was not set up. It was during a seminar class that they had the discussion.

[15] Student D was a member of student B's group and helped during his lesson preparation.

[16] Student teachers often receive comments from in-service teachers that they make mistakes in writing orders of Kanji during student teaching.

Academic advisor B of KU University often emphasises more insightful learning is produced when pre-service teachers with a variety of backgrounds get together. He is in charge of teacher education at a junior college, which has two departments: life design studies and childhood studies. The latter has about 120 students a year, most of whom graduate with a second degree teaching certificate for kindergarten and elementary school. He also teaches geography related subjects at AU University and is involved in secondary school pre-service teacher education as a part-time lecturer. Moreover, he is a former high school teacher. His professional career has led him to this awareness.

Academic advisor A of AU University points out first that preparing for the mock lesson meeting produces a sense of achievement and then increases their self-efficacy. 18 students from AU University were supposed to create a lesson plan as a team. However, only C, D, E and some other students actively engaged in preparing a 50-minute lesson. They were satisfied with the cooperation, but were disappointed about other students showing little interest in it. Student C said, 'Sense of achievement, a different experience [that others have not had] increase our sense of self-confidence'. However, those students 'have attended meetings to prepare lessons just for their credits. It is truly difficult to make a team. It is OK that they have their own goal, but at least we should have a common understanding [about participating in the mock lesson meeting as a seminar activity]'. Student D also shared his opinion, '[Other students] felt weary of participating in this seminar activity. [We] could gain a sense of fulfilment [through it]. [There are] many things [we cannot] achieve alone'. Student E added, '[This was] an assignment which I could not complete by myself, but could complete through collaboration among the three of us. I have come to accept different ideas from others. It is simply fun to collaborate with others'. These remarks highlight that their communication has developed their sense of teaching practices. They have increasingly focused on cooperative studies.

But why were other students participating in preparation for the mock lesson meeting? First, many of those students showed less interest because they were not becoming a teacher. As mentioned before, the teaching certificate system in Japan is open to any institution in higher education. Most students enrolling in teacher education programmes are getting teaching certificate(s) but they do not choose teaching as their profession. It is also easy to drop out from teaching certificate programmes for personal reason(s). Secondly, they had a lack of both subject matter knowledge and pedagogy content knowledge. Students actively involved in this project frequently asked such students to give them their ideas, remarks, comments, or whatever they felt freely. They had expected them to take on the role of students. However, such students muttered, 'What should I say?' A female student of AU University said, 'I do not know what to do'. Academic advisor A knew such students also had some knowledge about subjects and pedagogy, as they had at least 12 years of student experiences and often spoke about their learning experiences during seminar classes. Students of AU University have not found individual 'core qualities' (Korthagen, Kim, and Greene 2013) each other. Consequently, they could not have produced the common understanding about the mock lesson meeting nor the common goal as a team. Even in such a small group, there were surely power-relations connected to knowledge of teaching, which academic advisor A strongly believes reflected self-confidence.

**Conclusions and Implications**

It is crucial that teacher education maintains its diversity. I strongly support open teacher education systems in which such a small local private university like AU University can also provide teacher education. Thus, in order to keep the quality of teacher education in such a limited situation, teacher educators from a couple of institutions, which are all local, small-sized and private universities have collaborated with each other and opened mock lessons with six meetings. There is no excuse like 'We cannot do it because our institution is small and/or local'. We should overcome such burdens through collaborations. It is true that future teachers are pretty busy in their studies, research, lectures, club activities, volunteer activities and part-time jobs to pay for their tuition given their economic situations stemming from economic disparities. However, they found their own meaning in preparing their lessons and practicing them during the meeting. They cultivated their perceptions of being a teacher and teaching, and pedagogy content knowledge. Academic advisors also learned from their students as interaction with those from a variety of backgrounds help develop future teachers professionally.

As in this paper's title, the role of a broker is crucially important as a teacher of teachers especially in small-sized universities.

On 14th May 2016, given the success of the mock lesson meeting, the Association of Teacher Education Practice and Research[17] was established. The purposes are mainly to support pre-service teachers to develop as future professionals and the main projects are to open mock lesson meetings and workshops for pre-service teachers. This association is a platform where parties involved in teacher education have partnerships with and learn from each other. However, they should still consider more proper missions and goals of the association: What size of the organization is appropriate? How should we meet financial goals when research budgets and school budgets have been decreasing yearly?

Lastly, a critical question is worth asking. Should teacher education be solely tied to individual efforts of students, teacher educators, and organisations? For years, subsidies from the central government for national universities have been decreasing gradually. Private universities, located in depopulated areas, are struggling to survive. Universities teaching the humanities, especially education, have even lower budgets. Competition, measurements, and improvements have been encouraged. Carrot and stick policies are actively employed by the government and receive a certain approval from society. They have twisted the power relationships between teacher education and governments. Politicians as well as citizens should understand the significance of teacher education and education, which place a lot of influence on the future of our children and our society.

**Acknowledgement**

I am sincerely grateful for students and academic advisors who have participated in this research, and my colleagues of higher and secondary education institutions, city or town government officials, and NPO officials who have made a number of contributions to professional development of future teachers in spite of their harsh working conditions.

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[17] The English name of this association is still being authorised by the board.

# Science and Mathematics Education

# Balancing Content Knowledge and Pedagogical Content Knowledge in Educating the Best Mathematics Teachers: An Irish Case Study

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**Abstract**
The idea that teachers need both to know their subject and to be skilled in teaching it is of long standing. However, Shulman's seminal papers in the 1980s provided a focus and a language for discussing the balance that might be struck between the two aspects in teacher education programmes. In particular, his constructs *content knowledge* (CK) and *pedagogical content knowledge* (PCK) have been rich fields for subsequent research. Work in the last fifteen years has addressed the construction of test items to measure CK and PCK, and has provided empirical evidence that the two constructs are distinct, although related; also, connections between teachers' CK and PCK and their students' achievement have been investigated. The results have important implications, both for teacher education and for official accreditation of teachers.
This paper offers a historical case study; it addresses the changing emphases in professional development for 'post-primary' (grades 7-12) mathematics teaching in the Republic of Ireland over the past 55 years, focusing on courses run to support changes in post-primary curricula. The main theoretical framework is provided by Shulman's work and its subsequent developments. The study relies largely on document analysis; however, since documentation especially from the early period is scarce, it also draws on insights from people who designed and/or or attended courses. Findings emphasise how the changing balance between CK and PCK reflect contemporary contexts and understanding of teacher knowledge, and point to areas for future development.

**Keywords**: Content knowledge, pedagogical content knowledge, professional development

## Introduction

The idea that teachers need both to know their subject and to be skilled in teaching it is of long standing. In the 1980s, two seminal papers by Lee Shulman (1986, 1987) provided a language for discussing the different kinds of knowledge that teachers ought to have, and hence for considering the balance that might be struck between them. Shulman distinguished several categories of content knowledge, including what he called subject matter content knowledge and pedagogical content knowledge; he referred also to general pedagogical knowledge. The constructs now commonly labelled as content knowledge (CK), pedagogical content knowledge (PCK) and pedagogical knowledge (PK) resonated with the mathematics and science education communities in particular, and have been much used to frame subsequent research.
This paper offers a case study set in the Republic of Ireland. Written in the context of increased stringency in accrediting teachers for working in Irish post-primary schools (schools for students typically aged 12 to 18), it addresses the changing emphases in continuing professional development (CPD) for mathematics teachers over the past 55 years. The focus is on CPD provided by the State Department of Education, or under its aegis, to support changes in post-primary mathematics curricula. The case study relies largely on document analysis. However, especially since documentation from early in the period is scarce, it also draws on insights from key participants in order to elicit their intentions, perceptions and/or experiences in designing or attending different sessions. The main aim, as well as recording the past, is to improve understanding of the contexts and influences that affected it, and so help to prepare for educating the best mathematics teachers in the future.
Some information about the Irish education system is relevant here. Post-primary education is divided into two cycles; the first leads to the Intermediate Certificate (up to 1988) or Junior Certificate (from 1989), the second to the Leaving Certificate. Current details are available on the Department of

Education website (www.education.ie; the name of this Department has changed twice during the period, but for convenience the simplest form is used here). Official documents specifying course content and related matters at post-primary level are designated as 'syllabuses' rather than curricula. Teacher accreditation, formerly the task of the Department's Registration Council, is now carried out by the Teaching Council (www.teachingcouncil.ie).

**Research Questions**

- For CPD provided to support the implementation of revised Irish post-primary mathematics syllabuses from the 1960s, what was the balance between CK and PCK?
- What were the cultural and contextual influences affecting this balance?

**Theoretical Framework**

The theoretical framework for the paper is provided by Shulman's (1986, 1987) categorisation of types of knowledge required by teachers. Shulman's starting point was recognition of a so-called missing paradigm in teacher education and accreditation, at least in the USA in the 1980s. He distinguished three categories of content knowledge, described as follows.

- *Subject matter content knowledge* referred to "the amount and organization of knowledge per se in the mind of the teacher." Unlike non-teacher users of mathematics, the teacher "need not only understand *that* something is so; the teacher must further understand *why* it is so..." (Shulman 1986, 9).
- *Pedagogical content knowledge* encompassed "the ways of representing and formulating the subject that make it comprehensible to others" (Shulman 1986, 9). It is "that special amalgam of content and pedagogy that is uniquely the province of teachers, their own special form of professional understanding" (Shulman 1987, 8), and includes meaningful ways of explaining concepts and results, as well as knowledge of likely student misconceptions.
- *Curricular knowledge* involved "grasp of the materials and programs that serve as 'tools of the trade' for teachers" (Shulman 1987, 8).

In addition to these forms of content knowledge, Shulman stressed the importance of *general pedagogical knowledge*, "with special reference to those broad principles and strategies of classroom management and organization that appear to transcend subject matter" (Shulman 1987, 8). In both papers, he also mentioned – but did not discuss – other forms of knowledge.

Rowland (2014) points out that Shulman's ideas emerged from an empirical study; however, they were expressed in theoretical terms. More recent studies have attempted to validate operationalised versions of CK and PCK and to investigate relationships between them. A review, emphasising the cultural contexts, is provided by Blömeke and Delaney (2012). Two major studies referring to secondary education – COACTIV (**Co**gnitively **Activ**ating Instruction) and TEDS-M (**T**eacher **E**ducation and **D**evelopment **S**tudy – Learning to teach **M**athematics) – are discussed in turn below. A third major source is the work of Deborah Ball and her team (see for example Hill, Ball and Schilling [2008] and, with regard to Ireland, Delaney [2010]); however, it considers primary teachers, so is not examined here.

***COACTIV***

COACTIV is a German study of teachers and pre-service teachers (Krauss, Baumert, and Blum 2008; Krauss et al. 2008; Baumert et al. 2010). It avails of the diversity of the German education system to address some key issues, though findings may not generalise to other countries. The study aimed at "conceptualizing and assessing a broad spectrum of teacher competencies" using the constructs CK and PCK (Krauss, Baumert, and Blum 2008, 874-5), and assessing operationalised versions via test items. The PCK items examined meaningful explanations, knowledge of student misconceptions, and also the ability to address mathematical tasks (Krauss et al. 2008). Begun in 2003 in conjunction with PISA (the Programme for International Student Assessment, a cross-national study of the achievement of 15-year-old students [www.oecd.org/pisa]), it related mathematics teachers' scores on the COACTIV

tests to the PISA mathematics scores of their students. The tests were also administered to comparison groups, including teachers of biology and chemistry, student teachers of mathematics, and mathematics undergraduates, all of whom might be expected to have lower mathematical CK and/or PCK than the qualified teachers of mathematics. A follow-up element in 2004 studied the relationship between the mathematics teachers' COACTIV scores and the increase in the scores of their students.
Findings for the different groups were broadly in line with expectations. For example, the scores of the teacher groups were consonant with differences in their subject specialisms and pre-service preparation, with mathematics teachers having higher CK and PCK than the teachers of biology and chemistry. This provided some validation that the tests measured the intended constructs (Krauss, Baumert, and Blum 2008). Also, the analysis indicated that CK and PCK are genuinely different, albeit overlapping, constructs (Krauss et al. 2008).
While it was an assumption of the study that *some* CK is a prerequisite for PCK (Baumert et al. 2010), the question arises as to what extent it is sufficient. The rather strong performance of the mathematics undergraduates in PCK (which they had not studied) was among the surprising outcomes; one interpretation is that strong CK can support the development of PCK. However, the longitudinal element of the study revealed PCK as the better predictor of student gains. Rowland (2014, 97) summarises the findings as follows: "weak CK puts limits on the growth of PCK. However, teacher PCK (as measured by the COACTIV instruments) predicts student progress – in the German secondary setting – better than teacher CK."

***TEDS-M***

TEDS-M was conducted by the International Association for the Evaluation of Educational Achievement (IEA), the body that runs the Trends in International Mathematics and Science Study (TIMSS) (timssandpirls.bc.edu). It examined the knowledge – 'MCK' and 'MPCK' – and also beliefs of pre-service primary and lower secondary teachers at the end of their teacher education programmes (Blömeke et al. 2014). MPCK was defined to include Shulman's category of *knowledge of curriculum*, an approach taken also in other research (Oldham and English 2005). Since some of the countries (more correctly in an IEA study, 'education systems') in TEDS-M also took part in TIMSS, it is possible to relate mean student-teacher scores to mean school-student scores. In seeking to identify patterns across 16 systems, TEDS-M allows for possible generalisation in a way that COACTIV does not, but it lacks the COACTIV connection between participating teachers and school students.

As in COACTIV, the constructs MCK and MPCK were operationalised via test items. The validity and reliability of the tests were deemed satisfactory for the international study, though not all cultures were equally well reflected. Findings with regard to the tests echo those of COACTIV with regard to some MCK being necessary for MPCK and for the two constructs ('concepts' in TEDS-M), though distinct, being difficult to separate.
For both populations, countries' rankings for MCK and MPCK were similar. Moreover, where TIMSS scores for the corresponding populations of school students were available, the rank order of mean student-teacher MCK scores in TEDS-M was remarkably similar to that of mean student scores in TIMSS; however, the implications are not obvious.

***Summary***

Findings from the two studies can be summarised as follows:

- The constructs CK and PCK can be operationalised via tests that are acceptably valid and reliable;
- The constructs are strongly related to each other, but can be distinguished;
- CK appears necessary but not in general sufficient for supporting or developing PCK;
- (Student-) teachers' CK and PCK are positively related to their countries' or students' achievement.

This has implications for teacher education and teacher accreditation. In particular, it provides a rationale for studying the balance between CK and PCK in specific teacher education programmes, and

critiquing it in the light of the contexts in which they operate. The Irish case study is built on that premise.

**Research Methods**

As the case study was essentially historical, key tasks were:

1. To identify documents that describe and analyse changes in Irish mathematics education from the 1960s, paying especial heed to sources addressing context (mathematical, educational and social);
2. To locate documentation referring to CPD provided in support of the syllabus changes.

The outcomes of the document analysis are reported below. However, documentation in the public domain with regard to CPD is sparse, so a third task had to be addressed:

3. To augment the information on CPD by consulting people who were involved, preferably as organisers, but with participants' voices also being relevant.

Discussion of methodology addresses this empirical element of the study.

Twelve people – Department of Education Inspectors, CPD organisers on behalf of the Department, and participants – were picked out to span the time period and provide a cross-section of experience. The author also figured, as an early participant and a later (minor) organiser. Use of a questionnaire or a rigid interview schedule was rejected, as being unsuited to the intended respondents' different ages and differing familiarity with Shulman's classification. Rather, it was decided to approach people by personal contact (via telephone, email or face to face), and to engage them in conversations that might elicit their perceptions of the main focus of the CPD in which they had been involved. Typically, the context was set by using Shulman's classification or an informal version of it, and options were offered with regard to priorities:

- Actual mathematics (content new to teachers)?
- Changes in syllabus content ('ins and outs')?
- Teaching methods?
- Changes to assessment?
- Something else?
- Any combination of the above?

Respondents were encouraged to provide reasons that related to the context at the time.

**Historical Analysis and Results**

Literature about Irish mathematics education especially for the early part of the period is rather scarce, and unfortunately much of it is the work of the present author. Considerations of space necessitate giving priority to papers that provide overviews and list key references (for example, Oldham [1980] and Oldham [2007]). With regard to CPD, there is even less documentation in the public domain. A paper by the present author and a colleague (Oldham and English 2005) traced the development of CPD over much of the period; it provides a major source for the current paper. However, its focus was on the extent to which CPD was increasingly driven by theoretical considerations, including, but not restricted to, work on teachers' knowledge; concentration now is on a more nuanced view of the latter topic. Of the twelve people approached, ten – spanning the time period studied and the different roles – offered insights and/or referred the queries to colleagues; where multiple interactions took place, the dates recorded below refer to the most recent.

The period can be divided into four phases. The first and last encompassed radical development in mathematics education in Ireland; the two middle phases cover less dramatic syllabus reviews, with the third phase also including significant alterations in the focus of CPD. Changes in culture and context, in particular increased uptake of post-primary education and entry for State examinations, form a backdrop to the entire period (Oldham 1980, 2007). Material otherwise unattributed below is drawn from the paper by Oldham and English (2005).

***Phase 1 – 1960s to mid-1970s: radical syllabus change, CK predominant***

The first phase was marked by major revisions of post-primary mathematics syllabuses in Ireland, reflecting the 'modern mathematics' movement of the late 1950s and 1960s. Personnel from the Department of Education engaged deeply with the movement (Oldham 1980). To prepare teachers for the significant change in content, involving material that many of them had never encountered, the Department organised courses held in the summer holidays ('summer courses') at which new topics were presented. It was natural that the focus of the courses was on CK. Attendance was voluntary, and many teachers were enthusiastic participants. One teacher recalled discourse around addressing, in school, topics such as groups that by then were part of university mathematics courses. However, she also indicated that her own learning style entailed understanding "every single hieroglyphic," so that she could register the process of learning and therefore help her students appropriately (Elizabeth Caird, personal communications, 10 August 2016). In other words, while the courses explicitly emphasised CK, she herself viewed them also through the lens of PCK. So, perhaps, did a friend of hers:

> I have been … attending this mathematics course conducted by three teachers from Belgium, Sweden and England, the course having been arranged by the Department of Education…. I have a long way to go before I feel sufficiently conversant with all these new ideas so as to be able to teach with confidence. (Letter from Freda Yates to Elizabeth Caird, 24 June 1964)

It is worth noting that, since the content was new to school curricula worldwide, even "teachers from Belgium, Sweden and England" did not have an established body of PCK to share with participants.

After the initial introduction of new material for the Leaving Certificate in 1964, two further rounds of change took place in just over a decade. In each case, alterations were made to the Intermediate Certificate syllabuses first (1966 and 1973), with consequent revisions to the Leaving Certificate three years later (Oldham 1980). Summer courses continued to be offered to support the changes. While the original summer courses were of up to three weeks' duration, the norm became a single week, with the focus mainly on CK for the more advanced material.

An exception to this trend is worth noting. One topic that caused difficulties for both CK and PCK was geometry, especially for the Intermediate Certificate. A traditional approach with proofs based on congruency had been successful only for higher-achieving students. Initially (1966), it was augmented by an approach using transformations, in the spirit of modern mathematics (Oldham 1980). The author of this paper, a school teacher at the time, experienced the difficulty of making the two systems mutually coherent. In the 1973 revision, a unified system based on equipollent couples was introduced, and CPD was provided to support it. The inspector chiefly responsible – both for the new system and for the CPD – agreed in conversation with the author that the main focus was on CK, as people needed to know the content before they could teach it (Con Ó Caoimh, personal communications, 6 October 2016). The author attended a geometry summer course in 1974; her notes confirm the emphasis on CK, but also indicate that the lecturers – Irish teachers – made references to how they might present the material in school classes.

***Phase 2 – later 1970s and 1980s: ongoing context change, little CPD***

From the late 1960s to the 1980s, the number of students taking State examinations was increasing rapidly, and syllabuses originally designed for (relatively speaking) an academic elite did not necessarily suit lower achievers (Oldham 1980, 2007). "In hindsight, it would appear that, from the 1970s, in-service courses focusing on … PCK would have been appropriate" (Oldham and English 2005, 5). However, this was not the tradition at the time. Moreover, as such CPD would have been addressing a change in the student body rather than the syllabuses, the issue lies outside the remit of this paper.

The next cycle of revision was implemented for the Intermediate Certificate in 1987 and for the Leaving Certificate over the period 1990-95 (Oldham 2007). The Intermediate Certificate changes belong to Phase 2. They included introduction of an additional syllabus catering for the lower achievers (Oldham 2007); for this syllabus, CPD focusing on PCK – in particular on constructivist approaches consonant with the (intended) character of the primary school curriculum – would have been particularly suitable. However, at a time of economic recession, there was no money for meaningful support.

***Phase 3 – 1990s and early 2000s: increasing emphasis on PCK***

The culture for CPD had changed by the 1990s when the Leaving Certificate syllabuses were reviewed (Oldham 2007). For the main revision implemented in 1992, teachers were encouraged (though again not required) to attend one of a number of one-day meetings during school term. Such short sessions obviously did not allow for CK to be addressed in depth, and in any case there was little new content. With regard to Shulman's classification, the emphasis was on *knowledge of curriculum* – aims, content, and assessment, which are identified as part of PCK by some writers, as mentioned above – in order to help teachers understand the rationale for and scope of the changes. The present author contributed to that focus; details are in the paper by Oldham and English (2005).

That paper omitted reference to summer courses supporting the new syllabuses. As part of the official provision, they were designed and run by the Irish Mathematics Teachers Association (IMTA) at the request of the Department. The then chairperson of the IMTA noted the emphasis given to PCK while also providing content coverage: "We put together a top class team of professional teachers … with quality notes. The focus was on methodology and making the teaching exciting with plenty of examples…." (Sean Ashe, personal communications, 29 September 2016). He also referred to the success of the courses with regard to numbers attending, demands for repeat versions, and the social atmosphere in which lasting friendships were developed.

When the junior cycle syllabuses were next revised (Oldham 2007) – for the examination by then called the Junior Certificate – a new team of Departmental inspectors was in charge. While the inspectors in the 1960s had engaged with worldwide trends in curriculum content, their successors focused more on teaching and learning. Additionally, greater funding was available than heretofore. A four-year programme of CPD was provided, from 2000 to 2004; during the first two years, presenters addressed teachers from groups of schools at half-day sessions (similar to provision for the Leaving Certificate in the 1990s), while for the second two years a small number of Regional Development Officers (RDOs) actually visited schools to dialogue with teachers. Work done in the early period contributed to a book of guidelines for teachers (www.projectmaths.ie/documents/PDF/JCMathsGuidelines.pdf) and in particular to its emphasis on methodology: a major 'first' for Irish post-primary mathematics. All three respondents who commented on this programme – two inspectors, and a teacher who ultimately led the RDO team – endorsed the priority given to PCK. In the words of the inspector chiefly responsible:

> Our main priority was to support teachers in 'teaching for understanding' and … this was a new concept to be pushing for [post-primary] teachers back in 2000. So, while some emphasis was on 'ins and outs' and on the new format of exam papers, our approach was to pull teachers' attention away from these 'mechanical' aspects and focus instead on methodologies…. (Doreen McMorris, personal communications, 6 October 2016)

Some 'methodologies' involved PK rather than PCK, but the *lesson ideas* that form the core of the guidelines offered key aspects of PCK: meaningful explanations and ways of addressing misconceptions. The other inspector noted that CK was not a focus – except for one topic echoing earlier times: "everyone getting their heads around what kind of geometry we were doing" (Hugh McManus, personal communications, 3 October 2016). The RDO team leader stated that "emphasis was very much on active teaching methodologies," citing work done with ICTs and on using teaching aids and approaches for algebra, geometry and functions (Joe English, personal communications, 6 October 2016).

***Phase 4 – 2008-2016: more PCK but renewed emphasis on CK***

This phase saw the first *root-and-branch* reform of mathematics education for fifty years. The reform initiative, known as Project Maths and launched in 2008, addressed the Junior and the Leaving Certificate syllabuses simultaneously, advocated active methodologies more strongly than before, and made changes in assessment to emphasise problem solving and applications (Merriman et al. 2014). The Project Maths Development Team was set up to support teaching and learning. It provided CPD in the spirit of that offered earlier for the Junior Certificate, but on a larger scale: for example, via a series of ten workshops, each run many times, with much more extensive support material (www.projectmaths.ie). The national co-ordinator pointed out that though the main emphasis was on

methodologies – hence, PCK (and PK) – some coverage was also given to CK where inspectors' reports and research studies had indicated that it was lacking (Anne Brosnan, personal communications, 11 October 2016).

During this phase, a new element emerged: teacher qualifications. The recently instituted Teaching Council updated requirements for accreditation of new teachers, specifying in detail the subject content that they must have studied in their degree programmes (www.teachingcouncil.ie). The qualifications of many current teachers of mathematics did not match the requirements (Cosgrave et al. 2004; Ní Ríordáin and Hannigan 2011), and policymakers saw this as likely to hinder the success of Project Maths. Funding was provided for a two-year part-time Professional Diploma in Mathematics for Teaching, developed by a consortium of higher education institutions led by the University of Limerick and the National University of Ireland, Galway (www.ul.ie:8081/graduateschool/course/professional-diploma-mathematics-teaching-level-8). One of the developers noted the prominence given to research-based principles: for example, that strong CK is essential for good teaching, and that PCK and CK are not independent and should be treated together (personal communications, John O'Donoghue, 5 October 2016). The programme, delivered in blended format, has already been taken by hundreds of teachers. A participant, in his favourable comments, emphasised the fact that it leads to certification – a new feature for Department-initiated CPD (Horst Punzet, personal communication, 30 August 2016). The involvement of higher education institutions will facilitate documentation, evaluation and research for future use.

**Discussion and Conclusion**

This paper explored the balance between CK and PCK over the past 55 years in professional development for Irish post-primary mathematics teachers, in particular that offered by the state Department of Education or under its aegis to support the introduction of revised syllabuses. Review of the literature providing the theoretical framework – Shulman's (1986, 1987) and subsequent writings on knowledge for teaching, especially content knowledge (CK) and pedagogical content knowledge (PCK) – indicated the validity of using the constructs, of treating them as distinct although overlapping, and indeed of seeking ultimately to operationalise them for measurement purposes. The historical study identified how the shifting balance reflected and responded to contemporary contexts (mathematical, educational and social). Mathematical content issues dominated early on. Deeper understanding of mathematical knowledge for teaching helped to inform the design of the later sessions; in particular, the most recent ones are based on findings about the positive interaction between CK and PCK, and provide good opportunities for research into effective professional development.

While initial teacher education lies outside the main remit of the paper, the findings are applicable there also. The most common route to post-primary teaching in Ireland is 'consecutive' – a subject-specialist degree, traditionally followed by a one-year professional diploma in education. That pathway now requires an honours degree and a two-year professional qualification at master's level, opening up possibilities for developing both CK and PCK more fully. However, challenges still remain; the CK in the degree is not normally focused on knowledge specifically for teaching, and the professional course has to cover many aspects – foundational and practical – in addition to subject-specialist work. The question arises as to whether use might be made, at entry to the teaching profession or at some interval(s) subsequently, of tests such as those used in the COACTIV and TEDS-M studies. There is room for innovation and research.

The issues are relevant beyond the limited context addressed in this paper. Depending on the routes to qualified teacher status – which differ both between and within countries – mathematics teacher educators responding to research may find it necessary to place more emphasis on CK or PCK than has traditionally been the case. There may also be a need for authorities regulating membership of the teaching profession in some countries to move beyond looking only at general information provided by teachers' degrees and professional qualifications, and to assess aspects of teachers' CK and PCK most relevant to student achievement. Such work may help in the ongoing task of educating the best mathematics teachers.

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# Prospective Primary School Teachers' Knowledge of the Ratio Concept

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**Abstract**
Prospective primary school teachers (PPST) learn about some mathematics concepts in several courses besides the mathematics ones. This happens with the ratio concept which is a cross subject and instrumental concept. Research has shown that this concept is quite hard to master even though it is often used in school as well as in everyday life. This research aims at investigating PPST's knowledge on the ratio concept, namely with regard to their ability to interpret and compare ratios in two different contexts. Data were collected from 81 PPST attending a Portuguese university by means of a questionnaire. Participants were asked to answer to two questions that involve the ratio concept: one of them deals with a pizza division and requires a comparison of homogeneous quantities; the other one deals with the speed concept and involves a comparison of heterogeneous quantities. Both questions require information from a graph to be picked up. Data analysis showed that, in the pizza question, participants in the study tend to use numerical representations under the format of a fraction, which led them to do correct comparison between two ratios. In the case of the speed question, PPST showed more difficulties which seem to have been caused by the physical meaning of speed. Thus, the results suggest that most of these PPST hold a limited and rigid knowledge of the ratio concept that may be due to learning process based on numerical representations and carried out within mathematics courses. An implication of this is that teacher educators need to find ways of developing PPST's cross subject knowledge of the ratio concept so that they can be better prepared to teach this concept to young children embedded into cross disciplinary everyday life contexts.

**Keywords:** Prospective primary school teachers, ratio comparisons, ratio representations

## Introduction

After the implementation of the Bologna process, primary school teacher education in Portugal is a two-step process, including a 180 ECTS three yearlong undergraduate programme (*Licenciatura* in Basic Education) followed by 120 ECTS two yearlong master programmes. These master's curricula depend on whether prospective teacher qualify to teach up to the 4$^{th}$ grade or up to the 6$^{th}$ grade (with a specialization either on science and mathematics or on Portuguese language, history and geography). The undergraduate programme provides training on the diverse subjects that teacher candidates will teach in the future (Portuguese, mathematics, natural and social sciences, arts and physical education) as well as on education. The master programmes provide further training on education and on the school subjects that prospective teachers are preparing to teach, but they concentrate especially on subject specific methods courses and on teaching practice.

Thus, prospective primary school teachers (PPST) learn mathematics (at least 25 ECTS, as dictated by the Portuguese Law) in their undergraduate programme. This encompasses all the mathematics knowledge they would formally acquire within the scope of their training to teach the mathematics component to 1$^{st}$ to 4$^{th}$ graders. As matter of fact, only those PPST that choose a science and mathematics master's specialization (that would enable them to teach Science and Mathematics to grades 5 and 6) will learn some more mathematics (10 ECTS).

Taken together, the undergraduate programme and the master's programme cover all the knowledge components that Shulman (1986) has highlighted as being necessary for a teacher to teach effectively. These components are: content knowledge; pedagogical content knowledge; curricular knowledge and pedagogical knowledge.

Ball and others (2008) differentiate between two types of mathematics content knowledge: the common one and the specialized one. The former has to do with mathematics knowledge that anyone with a formal background in mathematics holds; the latter has to do with the understanding of the

procedures and language relative to a given mathematics concept. This type of content knowledge distinguishes the mathematics teacher from another person with a mathematics background and it enables teachers to use and teach appropriate representations of mathematics concepts. This paper focuses on content knowledge, more specifically on mathematics knowledge.

**Objective of the Research**

The ratio concept is a multifaceted mathematics concept that relates to other mathematics concepts and that is used in other subjects, namely in science. The ratio concept dependency on other concepts and the variety of conceptions and representations that may be associated with it may require teachers to hold a good level of specialized content knowledge (Ball, Thames, & Phelps, 2008) if they are expected to appropriately teach this concept.

Thus, the aim of this piece of research was find out how PPST deal with problem situations involving ratio representations and comparisons. It draws on and adds to previous research dealing with PPST's understanding of ratio as it compares how PPST perform in different problem situations which is an issue that seems to have not yet been tackled.

**Theoretical Background**

***Representations of Mathematics Concepts***

The representations of mathematical concepts have concentrated researchers' attention for a long time. Lesh, Post and Behr (1987) state that representations are related to the internal assimilation of mathematics ideas, and therefore they have to do with the mental reproduction of a concept, and to the representation of images, symbols and signals associated with it. Thus, representations may be pictures and diagrams, spoken and written language, manipulative models, and real world situations (Lesh, Post, & Behr 1987). Thus, a representation "is a configuration that can *represent* something else in some manner" (Goldin 2002).

Several authors (e.g., Dreyfus 2002; Goldin, & Kaput 1996) differentiate internal from external representations. The external representations are ways of personalization of ideas and concepts that use written or spoken language and that aim at making the communication about the concept easier (Dreyfus 2002). Maps, tables, graphs, diagrams, models, and formal symbol systems are examples of external representations. Friedlander and Tabach (2001) distinguish four ways of doing external representations that they believe are at the core of mathematics: (i) verbal; (ii) numeric; (iii) graphic; (iv) algebraic. The internal representations are the cognitive constructions that are formed in an individual's mind (Goldin, & Kaput 1996). They are often named as mental images and have to do with internal schemes or frameworks through which a person interacts with the external world.

The use of several representations of a given concept, object or situation facilitates the transition from a concrete and limited understanding to a more flexible and abstract one (Dreyfus 2002). Lesh, Post and Behr (1987) stated that the understanding of a mathematics idea depends partly on: "(1) the capacity to recognize it when it is absorbed in a variety of different representational systems; (2) the capacity to manipulate the idea in a flexible way through representational systems; and (3) the translation of that idea from one system to the other" (p. 36).

In order to take most profit from the different representations, Dreyfus (2002) argued for the complementarity of the processes of abstraction and representation and added that they should develop in four stages as follows: (i) use of a single representation; (ii) use of more than one representation; (iii) establishment of connexions between representations; and (iv) integration of representations and establishment of flexible relationships among them. This way of conceiving the formation of mathematics concepts from multiple representations aims at facilitating the attainment of an ever increasing abstract conception of a mathematics concepts. The process that underpins the links among representations is translation which indicates that a change from a formulation of a mathematics relationship to another one is taking place.

***The Ratio Concept***

The ratio concept, taken as a comparison between quantities, is a multifaceted concept that is related with several other mathematics concepts, including rational number, proportionality and similarity. There are several conceptions of ratio and consequently there is no consensual way of defining it.

The ratio concept has connections with the rational number concept. This is why Lamon (2007) includes ratio in one of his constructs related to rational numbers. On one hand, the part-whole interpretation of rational numbers has to do with measure, and operator. Going through this type of interpretation processes facilitates the development of an understanding of measurement units and equivalent fractions. On the other hand, the quotient interpretation of rational numbers has to do with ratio and rates which are necessary to compare and to sum and subtract fractions. Besides, the operator interpretation has to do with multiplication and division of fractions which is an appropriate context for introducing these operations.

Lamon (2007) assumes that a ratio is a comparison between two quantities and he distinguishes between internal or homogeneous ratios and external or heterogeneous ratios. The former involve comparison between quantities of the same magnitude (within the variable); the latter involve comparisons between quantities of different magnitudes (between variables). Besides, according to Suggate, Davis and Goulding (2006), there are three types of ratio comparisons: part-part (e.g., Joseph eats two parts of the cake and Maria eats three parts of it); part-whole (e.g., Joseph has eaten two of the three parts of a cake); and whole-whole (e.g.; 1m in the map corresponds to 1 000 000m in reality). However, Viana and Miranda (2016) found out that when students are asked to compare ratios, they only use the equivalence of fractions (by reducing to the same denominator) or the transformation of a ratio into a decimal number or a percentage.

Besides, there is some empirical evidence that textbooks are sparse to support teaching of ratio in the primary school (Stafford, Oldham, & O'Dowd 2015). These results may at least in part be responsible for the fact that primary school teachers show a limited domain of mathematics content knowledge and do not perceive the difference between fraction and ratio and proportional reasoning (Livy, & Vale 2011). However, it is worth noting that this lack of ratio content knowledge may also be due to the fact that initial teacher education does not include the formal study of the ratio concept (Stafford, Oldham, & O'Dowd 2015) in some countries, including Portugal.

Berenson and others (2013) found out that prospective American, Irish and Portuguese mathematics and science teachers defined ratio as a comparison/relationship or as a fraction/percentage/proportion/division. As far as the representations of ratio through mathematical symbols are concerned, they used column (:), either isolated or integrated in expressions like: X:Y or 3:2, and fractions. In what concerns representations about how fractions are used, they made drawings, diagrams or other pictorial representations, showing comparisons or numerical representations (usually in everyday settings) or geometric properties (e.g., similarity) or statistical representations (e.g., bar graphs); very few participants in the study showed drawings (e.g., map scales in architecture or design settings) to illustrate applications of ratio.

Price (2014) also collected data with American elementary and secondary school teachers. She concluded that even though the results were similar to those reported by Berenson and others (2013), the elementary school teachers showed more diversity in their answers that the secondary school teachers did probably because the latter's training focused on a narrower content knowledge area and therefore they had more limited choices for their answers.

Data collected from prospective kindergarten teachers and PPST teachers (Fernandes, & Leite 2015) through the same questionnaire used by Berenson and others (2013) showed that subjects conceptualize ratio as a comparison or a relationship between magnitudes or as a mathematical operation but they do not make explicit the type of comparison involved in a ratio. Besides, they hardly relate it to rational numbers. Also, even though they used mathematical symbols to represent ratios, the majority used operations with letters or with constants or even the operation signals only. However, when they were asked to describe how they would explain ratios, they still used mathematical symbols but diagrams and graphs were the most used types of representations.

A follow up study, with an improved version of the questionnaire, mainly for language issues, was carried out with Irish prospective mathematics teachers (Oldham, & Shuilleabhain 2014). Even though the authors got more extensive responses, the results were also similar to the ones obtained by Berenson and others (2013). Afterwards, another research study (Oldham, Stafford, & O'Dowd 2015) focusing on primary school Irish prospective teachers highlighted their lack of readily available mathematics content knowledge to answer to the ratio questions, probably because ratio has not given enough attention in the teacher education curricula.

Ilany, Keret and Bem-Chaim (2004) concluded that the use of investigative activities that include tasks focused on settings that are familiar to prospective mathematics teachers and that require the use and the relationship of concepts that are relevant for a good understanding of the ratio concept may promote prospective teachers content knowledge as well as pedagogic content knowledge.

Oldham and Shuilleabhain (2014) have pointed out that ratio has been largely accepted as intuitively understood by students and teachers alike. However, the results of the research reviewed show that this is not the case. Rather, research involving PPST reveals 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 to another (Oldham, Stafford, & O'Dowd 2015). Thus, further understanding of prospective teachers' conceptual difficulties with the ratio concept is necessary if action is to be taken by teacher educators to improve prospective teachers' content knowledge on this concept.

**Methodology**

To attain the objective of this study, 81 PPST attending the 6$^{th}$ (that is the last) semester of a three yearlong undergraduate studies programme (*Licenciatura* in Basic education) in a University of the north of Portugal answered to a questionnaire on ratio. The subjects' age range was 20 to 34 years old with an average of 22,0 years old. All of them had studied a few mathematics courses at university. However, some of them had taken mathematics in secondary school while other had not. It is worth mentioning that they had not studied the ratio concept at university and had no experience of explaining the ratio concept to someone else.

Questionnaires on ratio (e.g., Berenson et al 2013; Oldham, & Shuilleabhain 2014) were not appropriate for the purpose of this study as they were not focused on subjects' performance in different ratio situations. Thus, two problem situations dealing with representations and comparisons of ratio were designed: the pizza question, involving part-whole comparisons and homogeneous magnitudes; the speed question, dealing with part-part comparisons and heterogeneous magnitudes. The problem situations were reviewed by science and mathematics education specialists. The versions of the problems that were used in this study are given in figures 1 and 2, after translation from Portuguese to English.

PPST were invited by one of the authors, in a face to face basis, to participate in the study during a class time. They were informed about the objective of the study and the anonymous character of the questionnaire and that they would be allowed to withdraw at any time even after initiating the process of answering to the questionnaire. All of them volunteered to participate. Data were collected under exam conditions by one of the authors who was teaching them the final mathematics course of their undergraduate studies. This fact may have led PPST to engage deeply into the questionnaire problem-solving process.

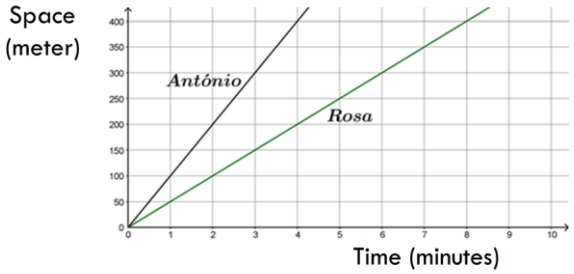
João and Maria bought a certain amount of pizza each one, as shown in the picture. The two pizzas are equal and so are the parts in which each pizza is divided.

Give other representations (as much as you can) of the amounts of pizza that João and Maria have bought. Explain those representations.

Who bought the largest amount of pizza, João or Maria? Explain your answer.

*Figure 1: The pizza problem*

António and Rosa went out for a walk. Their movement is shown in the following graph:




Who moved faster, António or Rosa? Why?

*Figure 2: The speed problem*

Data were content analysed based on a set of categories emerging from answers obtained in each question. Afterwards, absolute frequencies and percentages were computed for each category. To promote data reliability, content analysis was done by two of the authors, separately and discrepant cases were discussed with a third author.

## Findings

### *Results Relative to the Pizza Problem*

PPST were asked to give other representations (different from the one given in figure 1) of the amounts of pizza that João and Maria have bought and to explain those representations. Table 1 shows that they gave three general types of representations (diagrammatic, numeric, and numeric line representations), with some specific subtypes of representations in the diagrammatic and the numeric types. The types of representations obtained include two of the four types of external representations that Friedlander and Tabach (2001) consider as essential in mathematics.

The numeric representation was the one given by larger number of PPST. Almost all students (94%) used the fraction representation subtype and some of them also used the decimal (30%) and the percentage (10%) ways of representing a ratio. Most of the students that used decimal and percentage subtypes of representation started by doing a fraction representation and afterwards they transformed the fraction into the other subtypes of representation, through operative processes.

*Table 1: Types of other representations given by the PPST (N=81)*

| **Types of representation of Ratio** | | **f** | **%** |
|---|---|---|---|
| Diagrammatic representation | Continuous model | 61 | 75 |
| | Discrete model | 6 | 7 |
| Numerical representation | Fraction | 76 | 94 |
| | Decimal | 24 | 30 |
| | Percentage | 8 | 10 |
| Numerical line | | 3 | 4 |
| Do not answer | | 1 | 1 |

According to Lesh, Post and Behr (1987), the ability to translate an idea from one system of representation to another provides evidence of understanding of the idea that is at stake. In fact, the fraction could be obtained directly from reading the representation provided in the problem but the others needed to be computed and this requires understanding. Figure 3 shows an example of an answer that uses these three subtypes of numeric representation and even adds a diagrammatic representation which is different from the one given in the pizza problem (see figure 1). However, attention was given to the number of parts only and not to the rectangles that represent the unit (which are different in the two cases).

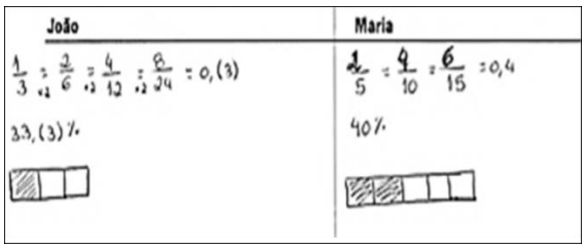



*Figure 3: representations of ratio (S14)*

As shown in table 1, large percentages of students gave diagrammatic representations, being the continuous (75%) subtype of representation much more frequent than the discrete one (7%). The larger use of the continuous representations may be due to the fact that it is usually used in classes to work with fractions and therefore it was probably very familiar to PPST. Figure 4 shows an example of a numerical (fraction) and a discrete representation.

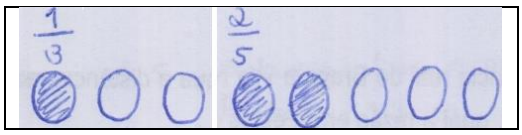


*Figure 4: representations of ratio (S11)*

The numeric line representations were the least frequent (4%) and they divided the unit in three and five parts respectively. Figure 5 shows an example of this type of representation.

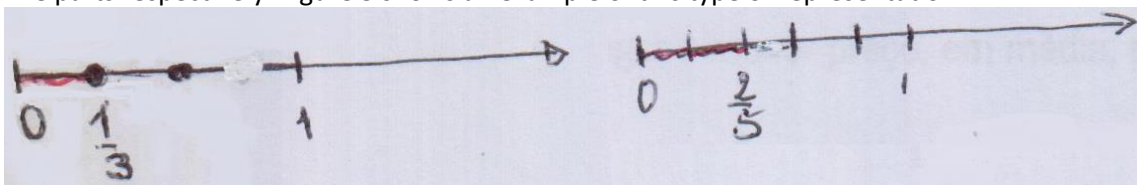


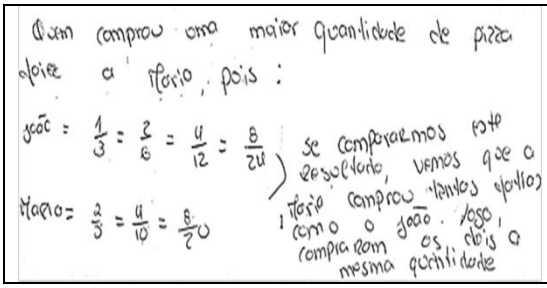

*Figure 5: Numeric line representation of ratio (S33)*

Thus, PPST were able to do part-whole representations of ratio that differ from the one given in the problem. Besides, as the values of the percentages obtained for the most frequent subtypes of representations indicate, several PPST gave more than one type of representation. In fact, they have combined numeric representations (mainly of the fraction and/or decimal subtypes) with diagrammatic representations (mainly of the continuous subtype). These types of representations had been found in previous studies focusing on PPST (e.g., Berenson et al 2013; Stafford, Oldham, & O'Dowd 2015) even though Fernandes and Leite (2015) found that the diagrammatic representations were more popular to explain ratio to someone else than to just represent ratios.
Afterwards, PPST were asked to compare the two ratios and to identify the biggest one. To do so, they would need to select and use a type of representation. Table 2 shows that about one third (31%) of them did not explain how they reached that answer or why it is the correct answer. The remaining 68% used numerical representations to do the required ratio comparison.

*Table 2: Types of comparisons of ratio done by the students (N=81)*

| **Types of comparisons** | | **f** | **%** |
|---|---|---|---|
| Fractions comparison | Reducing to same numerator/denominator | 21 | 26 |
| | Intuition | 12 | 15 |
| Percentage comparison | | 4 | 5 |
| Decimal comparison | | 18 | 22 |
| No justification | | 25 | 31 |
| Do not answer | | 1 | 1 |

Most of the PPST that used fractions computed equivalent fractions by reducing fractions to the same denominator or to de same numerator, that is they used a strategy previously described by Viana and Miranda (2016). However, some of the students that have opted for reducing fraction to the same numerator found some difficulties that are illustrated in figure 6.




Who bought the largest amount of pizza was Maria, because:

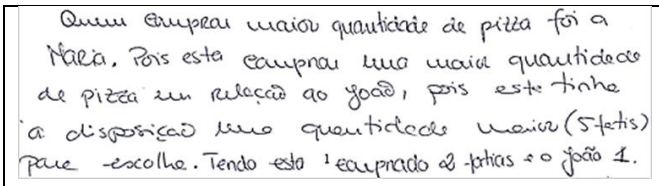
$João = \frac{1}{3} = \frac{2}{6} = \frac{4}{12} = \frac{8}{24}$

$Maria = \frac{2}{5} = \frac{4}{10} = \frac{8}{20}$

If we compare these results, we will note that Maria has bought as many slices as João. Then, they bought the same amount.

*Figure 6: Fractions comparison based on reduction to the same numerator (S77 original answer | translated answer)*

In fact, by focusing only on the numerator, they forgot about the denominators (which were different) and drew a wrong conclusion. Besides, in some cases, they gave answers containing internal contradictions (which the PPST seem to have not perceived). It is the case of the answer given in figure 6 that started by stating that Maria had bought the largest amount of pizza and that ended by concluding that both João and Maria bought the same amount of pizza.
PPST that made intuitive comparisons did an intuitive comparison of the areas of pizza bought by João and Maria based on the number of parts of pizza bought by each of them. They compared the fractions 1/3 and 2/5 and concluded that 2/5 would represent the largest amount as it corresponds to two parts while the 1/3 corresponds to only one part. They just ignored that the areas of each slice were different in the two cases and drew a conclusion without taking it into account. This reasoning is illustrated in figure 7. Even though 2/5 is larger than 1/3 and the result is correct, this type of reasoning (that ignores the denominators) does not give any systematic guarantee of reaching a correct answer through it.


Quem comprou maior quantidade de pizza foi a Maria, Pois esta comprou uma maior quantidade de pizza em relação ao João, pois este tinha a disposição uma quantidade maior (5 fatis) para escolhe. Tendo esta 1 comprado a fatias e o João 1.

Who bought the largest amount of pizza was Maria. Because she bought more pizza compared with João, as she had a larger amount of pizza (5 slices) to choose from. And she bought 2 slices and João bought only 1.

*Figure 7: Intuitive comparison based on the numerator only (S03 original answer | translated answer)*

Thus, a considerable amount of PPST used decimals (22%) but only a few used percentages (5%) to compare the parts of pizza that João and Maria have bought. Most of them did correct answers showing ability to do what Lamon (2007) and Suggate, Davis and Goulding (2006) call part-whole comparisons.

***Results Relative to the Speed Problem***

Table 3 shows the types of strategies that PPST used to find out who moved faster (António or Rosa). It should be emphasised that to succeed in doing so they were required to calculate ratios (speed values) and to do part-part comparisons.

*Table 3: Types of strategies used to obtain the highest speed (N=81)*

| **Type of strategy** | **f** | **%** |
|---|---|---|
| Compute speeds to choose the highest | 28 | 35 |
| Compare times needed to follow a certain path | 42 | 52 |
| Compare spaces followed in a given time interval | 7 | 9 |
| Do not answer | 4 | 5 |

PPST that computed the highest speed started by calculating António's and Rosa's speeds, afterwards they compared them and finally they identified the highest speed. This was the case shown in figure 8. It should be noted that as no information was provided on the units that should be used for speed, most PPST used m/min, as it was in the graph but a few used the international units' system speed unit (m/s), as S36 did. A few PPST reached a wrong result because they took wrong values from the graph or they did not pay attention to units that were used in the graph.

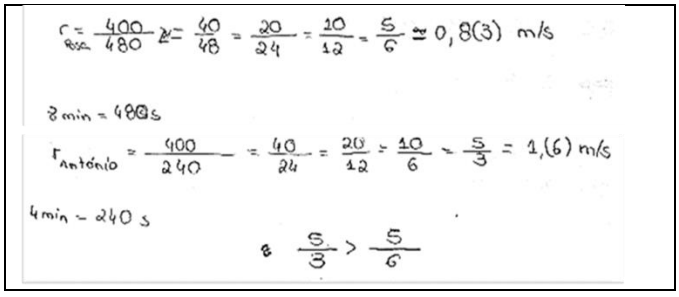



*Figure 8: Computation of the highest speed through speeds comparison (S36)*

As far as the comparison of times needed to cover a certain path is concerned, PPST compared the times used by António and Rosa to cover the path and concluded that the highest speed belongs to the person hat used less time to do it. Most of these students took as reference 400m that is the highest path length value given in the graph (figure 9). It would be interesting to understand the reasoning underpinning this choice. Half of the other PPST used other path values and the remaining just did a qualitative comparison without mentioning any specific path length value.

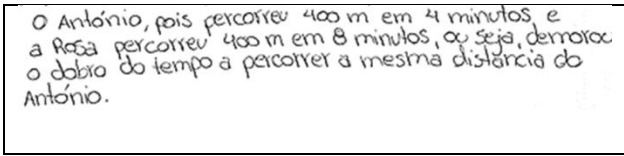
| | |
|---|---|
|  O António, pois percorreu 400 m em 4 minutos e a Rosa percorreu 400 m em 8 minutos, ou seja, demorou o dobro do tempo a percorrer a mesma distância do António. | António because he walked 400 m in 4 minutes and Rosa walked 400 m in 8 minutes that is, she doubled the time used by António to walk the same distance. |

*Figure 9: Computation of the highest speed through times comparison (S13 original answer | translated answer)*

PPST that opted for comparing the path covered in a given time by António and Rosa, they took the values from the graph to conclude that the person that walked faster was the one that walked more meter. This time, they concentrated on 1 min or on 2 min that are the lower times explicitly shown in the graph. However, one did it for several time instants. These types of strategies should be further investigated as they may be due to speed alternative conceptions or to lack of graphicacy.
Hence, more than half of the PPST succeeded on solving the problem by comparing times or path lengths for the same space or the same time, instead of calculating and comparing heterogeneous ratios based on the speed mathematics formula and doing part-part comparisons.

**Conclusions and Implications for Teacher Education**

Results indicate that most PPST that participated in the study were able to solve problems that require operating with ratio in two different contexts: a context with homogeneous magnitudes and part whole comparisons and a context with heterogeneous magnitudes and part-part comparisons. However, nearly two thirds of them were not able to give more than one or two types of representation, about one third was not able to explain ratio comparisons, and only about one third were able to compare path covered/time ratios.
Thus, the results of this study suggest that a considerable number of PPST that participated in the study reported in this paper may lack content knowledge on the ratio concept. They also suggest that initial primary school teacher education needs to pay more attention to the ratio concept, by formally integrating it in the teacher education curriculum and by approaching it explicitly. Besides, the complex nature of the concept (Lamon 2007; Ilany, Keret, & Bem-Chaim 2004) together with the differences between the results obtained in the two problem situations suggest that this concept should be approached in several contexts (and not only in the mathematics one) from a conceptual and a representational points of view. This means that ratio content knowledge and ratio pedagogical content knowledge should be approached in an integrated manner to trigger each other. Finally, this may require mathematics' teacher educators and mathematics educators to work together to foster the development of PPST content knowledge of ratio.

**Acknowledgements**

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# Teacher Education and Digital Technology

# E-Skills of Prospective Teachers

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**Abstract**
Digital skills are an integral part of the teachers' qualification. The fourth annual European campaign e-Skills for Jobs 2015 initiated by the Directorate General for Enterprise and Industry of the European Commission took place in year 2015. As a part of the campaign, the IT Fitness Test 2015 took place in both Czech and Slovak Republic. It is an online test of digital knowledge and skills (e-Skills) that was designed primarily for self-evaluation of public participants. The test was designed and coordinated by the Slovak IT Association under the auspices of the Department of Informatics Education, FMFI, Comenius University in Bratislava in the Slovak Republic and in parallel to that, in the Czech Republic it was coordinated by The Centre for International Cooperation in Education under the auspices of the Ministry of Education, Youth and Sports. Hence, in 2015 it was made available in two languages – Slovak and Czech. Beyond the scope of the campaign, the IT Fitness Test in 2015 was specifically used to survey e-skills of students of the teacher training study programmes at three faculties of education – Jan Evangelista Purkyne University in Ústí nad Labem and Technical University in Liberec, both in the Czech Republic, and Comenius University in Bratislava, the Slovak Republic. The main focus are e-skills of prospective special and special educators. The paper describes the methodology and results of testing achieved by students. Student performance is compared to each other as well as to the results of the last year's IT Fitness Test 2014.

**Introduction**
Knowledge and skills in *digital technologies* (DT, in the same sense it is used the term Information and Communication Technology, ICT) belong to the important skills of people in the modern information society. In the Czech Republic, these competencies are not included among the so-called *core competencies* namely stated in the *Framework education programs*, nor at the primary, nor the secondary level.
However, DT affects many areas of human activities. Knowledge and skills in DT seem to be necessary for both the labour market and for self-fulfillment in private lives. The trend is clear—school-leavers living in an information society that is full of digital technologies will not be able to participate fully in society without mastering them. Although the use of many programs is not difficult, it is necessary to obey certain procedures and rules. Merely intuitive use can lead to mistakes and blunders with far-reaching consequences. Already today we can speak about so-called digital disadvantage—the individual cannot meaningfully and efficiently use the DT at work and in the daily life. An individual equipped only with “a classic education” (i.e. from pre-ICT era), will not have a chance to fully join the digital world even if his education was the most perfect one.

**E-Skills**
The full definition of e-skills used within the *e-Skills for Jobs* campaign is relatively broad and covers three categories of e-skills: ICT user skills, e-Skills (ICT practitioner skills) and e-business skills (a hybrid of technology and business skills sets). This definition has been used in the multitude of studies and projects and e-skills carried out by different actors and stakeholders in Europe since then. It has also been referred to and presented in the Tender Specifications of the present call for tender stating that the term “e-skills for competitiveness and innovation” should be used as the overarching term covering three main categories:

ICT practitioner skills: the capabilities required for researching, developing, designing, strategic planning, managing, producing, consulting, marketing, selling, integrating, installing, administering, maintaining, supporting and servicing ICT systems.
ICT user skills: the capabilities required for the effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work. User skills cover the use of common software tools and of specialised tools supporting business functions within industry. At the general level, they cover "digital literacy": the skills required for the confident and critical use of ICT for work, leisure, learning and communication.
e-Leadership skills: these cover a range of skills, attributes and attitudes related to: knowledge of the capabilities and limitations of software systems and information systems in use; ability to quickly assess new capabilities of existing systems and the relevance of offers of software and web services emerging on the market; ability to describe prototype solutions; understanding of the fundamentals of alignment of business and IT functions in an organisation (Gareis 2014).
When surveying the e-skills of prospective teachers by the IT Fitness test, the main focus is the ICT user skills mainly understood as the capabilities required for the effective application of ICT systems and devices by the individual.

**E-Skills for Jobs & IT Fitness Test**

***IT Fitness Test 2014***
In 2014, an on-going campaign *e-Skills for Jobs* has been launched under the European Commission's *Grand Coalition for Digital Jobs*. The main aim of the campaign is to help motivate young people to study and seek career opportunities in the field of ICT. Another goal is to stimulate public interest in increasing their level of IT skills for both ordinary life and professional purposes (DZS 2016). One of the campaign activities is the *IT Fitness test* by which the public can test their knowledge and skills related to information technology.
IT Fitness Test was carried out online in an interactive way through a web application www.itfitness.cz. There were two different tests of the multiple choice type. The first test was designed for basic school level (BSL, estimated participant age between 14–16 years) and the second test was intended primarily for high school, or even for those in higher age groups (HAG). Both tests were introduced by descriptive information section. Summary results of the test are given in the IT Fitness Test 2014 Report – Results (DZS 2016).
IT Fitness Test 2014 was used to determine the digital knowledge and skills of students in different branches of the study program Specialization in Pedagogy at Faculty of Education, University of J. E. Purkyne in Usti nad Labem (FEd UJEP), the Czech Republic. It was found that UJEP participants' results in BSL test were comparable with the results of other participants currently studying university, but FEd UJEP participants were significantly worse in the HAG test. It was shown that there are significant differences among college students. Their digital knowledge and skills range almost the whole evaluation scale from students without functional digital skills to students with above-average digital knowledge and skills that can be considered as individuals with functional literacy (Pešat 2015).

***IT Fitness Test 2015***
In 2015, an analogic structure of the test was used as in 2014. IT Fitness Test 2015 had introductory information section followed by the knowledge and competence test section. There were 25 multiple-choice items divided equally into the following five sections:

- Internet search;
- Internet safety;
- Social networking;
- Office applications;
- Complex tasks.

Each multiple choice test item (question) was randomly generated from four options. Thereby a large number of variants were provided and the test results were practically non-transferable among participants. When designing alternatives, an experience from the IT Fitness Test 2014 was used and four variants of questions were of about equal difficulty. Significantly harder items occurred only exceptionally (Kubincová 2015). The estimated time required to complete the whole test has increased to 45-60 minutes. Summary results of the test are given in the IT Fitness Test 2015 Report – Results (DZS 2015).

***IT Fitness Test 2015 at prospective teachers***

It Fitness test 2015 was used to determine the digital knowledge and skills of prospective teachers in different philology branches at FEd UJEP. Two groups of the reference samples to prospective teachers (TT—Teacher Training) were chosen – prospective teachers of non-informatics and informatics branches at the Faculty of Sciences, Humanities and Education, Technical University of Liberec, the Czech Republic (TUL) and students of pedagogical branches providing non-teacher qualification namely in special education (nonTE—nonTeacher Education) at both FEd UJEP and Faculty of Education of the Comenius University in Bratislava, the Slovak Republic (UNIBA).

Both tests (BSL and HAG) were given *as an obligatory homework* to students who enrolled ICT courses at FEd UJEP and TUL in the winter semester 2015/2016. Only the HAG test was given *as an obligatory homework* at UNIBA. A different methodology of participant selection was used at Faculty of Education, Palacky University in Olomouc, the Czech Republic. This group of participants was asked *to participate voluntarily* in testing. However, the return of completed test was only a few percent and it was marginal from the statistical point of view. The results of this group were not sufficient for the correct statistical processing.

The on-line testing application was provided by an external company. Due to the specific properties of the testing application, it was not possible to extract students' results directly from the online recorded results data file. Therefore, students have always copied their test results from the display into the picture (screenshot). Subsequently, they sent an e-mail with the screenshot to the mail address itfitness2015@gmail.com for further processing. In the email subject, the students reported their identification in the form of an exact text string as follows: E-skills_university abbreviation_year of study_branch of study_date of lecture_name&surname initials. Students were instructed to complete the test without any help because one of the objectives of the ICT subject was the practicing and consolidation of digital knowledge and skills. They were informed that they can use test results by themselves as an indicator of their knowledge and skills (self-assessment). The teachers declared not to apply their results in the assessment of their study except verifying that the file with the test results was delivered at all.

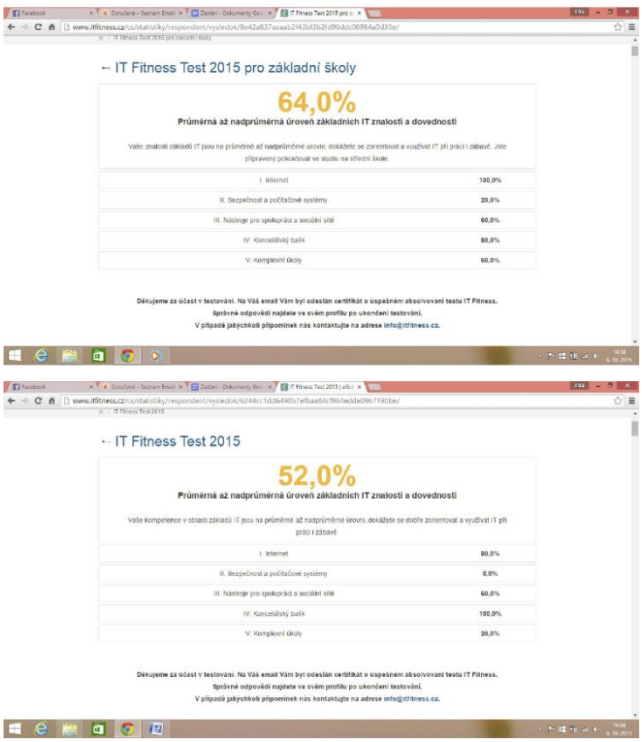


***Figure 1*** *An example of the screenshot with results of the IT Fitness Test 2015 that was sent by student to further processing*

An example of student results is shown in Figure 1. When processing the results, it was visually checked that there are no identic numerical combinations of values and that the screenshots vary in fine details, i.e. that students did not forward screenshots with results one to each other.

The test was entered to students as is described above. Results of individual participants were tabulated and basic quantities of descriptive statistics were calculated. The comparable groups of students of the following study programmes were chosen for further processing and analysis:

A. Philology (UJEP Bc. level, general base within teacher training, year 1 of 3, total 180 ECTS credits, full-time);
B. Czech Language for Media and Public Sphere (UJEP Bc. level, non-teacher education, year 1 of 3, total 180 ECTS credits, full-time);
C. Physical Education and Sport (UJEP Bc. level, general base within teacher training, year 1 of 3, total 180 ECTS credits, full-time);
D. Special pedagogy—intervention (UJEP Bc. level, non-teacher education, year 1 of 3, total 180 ECTS credits, full-time);
E. Social pedagogy (UJEP Bc. level, non-teacher education, year 1 of 3, total 180 ECTS credits, full-time);
F. Non-Informatics Prospective Teacher (TUL Bc. level, teacher training, year 1 of 3, total 180 ECTS credits, full-time);
G. Informatics Prospective Teacher (TUL Bc. level, teacher training, year 1 of 3, total 180 ECTS credits, part-time);
H. Informatics Prospective Teacher (TUL Master level, teacher training, year 1 of 3, total 120 ECTS credits, full-time);
I. Special pedagogy (UNIBA Bc. level, non-teacher education, year 1 of 3, total 180 ECTS credits, full-time);
J. Special pedagogy (UNIBA Master level, non-teacher education, year 1 of 3, total 180 ECTS credits, full-time).

The average score was calculated as well as standard deviation, modus & median of scores and minimum & maximum of scores. The resulting values are given in Table 1.

It was found that in the same group of participants the BSL results of the IT Fitness Test 2015 significantly differ from the HAG results, the average scores in the HAG test are about 10% lower. There are no significant differences in results of both prospective teachers in non-informatics branches (mainly philology) and non-teacher branches (special education) at surveyed groups of students at UJEP, TUL and UNIBA. When comparing students of bachelor's and master's degree, the difference is about the threshold of statistical significance, there is a tendency to better results at the master's students comparing to undergraduate students. It was found that there are students with a significantly different level of digital knowledge and skills in any group. Any respondent was successful at least in one item, the minimum score in the BSL test was 25 % and 16 % in the HAG test respectively. If these results truly reflect the digital knowledge and skills of prospective teachers, these students cannot be considered as teachers with a functional digital literacy. The maximum score of any group in the BSL test was above 80 % and above 76 % in the HAG test respectively (except the physical education group). These students can be considered as individuals with above-average digital knowledge and skills, i.e. individuals proving functional digital literacy.

Participants' knowledge and skills in different areas were examined as well, the results are shown in Table 2 and in Figure 1 for a clear overview. It was found that statistically the best knowledge and skills students have in searching information on the Internet. The worst knowledge and skills students have in the area of internet safety. In other areas the differences are not statistically significant, the complex tasks section shows a tendency to worse scores.

***Table 1*** *IT Fitness Test 2015 – results of prospective teachers and special educators (reference sample)*

| | IT Fitness Test 2015 | Basic School Level (BSL) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | program of study | sum of particip. [n] | average score [%] | standard deviation [%] | modus [%] | median [%] | min. score [%] | max. score [%] |
| UJEP | A = Bc. Philology (TT, 1Y, FT) | 31 | 64,4 | 12,4 | 60 | 68 | 36 | 84 |
| | B = Bc. Czech Language (nonTE, 1Y, FT) | 22 | 62,9 | 11,1 | 60 | 62 | 44 | 84 |
| | C = Bc. Physical Education (TT, 1Y, FT) | 12 | 59,0 | 15,8 | 56 | 56 | 28 | 84 |
| | D = Bc. Special pedagogy (nonTE, 1Y, FT) | 25 | 62,2 | 10,9 | 56 | 60 | 48 | 84 |
| | E = Bc. Social pedagogy (nonTE, 1Y, FT) | 29 | 59,7 | 12,7 | 52 | 60 | 32 | 80 |
| | Teacher Training overall | 43 | 62,9 | 13,6 | 60 | 64 | 28 | 84 |
| | nonTeacher Education overall | 76 | 61,5 | 11,7 | 60 | 60 | 32 | 84 |
| | overall | 119 | 62,0 | 12,5 | 60 | 60 | 28 | 84 |
| TUL | F = Bc. non-Informatics (TT, 1Y, FT) | 29 | 63,4 | 18,1 | 60 | 68 | 24 | 96 |
| | G = Bc. Informatics (TT, 1Y, PT) | 8 | 65,3 | 15,3 | 76 | 68 | 40 | 84 |
| | H = NMgr. Informatics (TT, 1Y, FT) | 5 | 68,0 | 7,7 | not stated | 66 | 60 | 80 |
| | overall | 42 | 64,7 | 15,9 | 60 | 68 | 24 | 96 |
| | IT Fitness Test 2015 | Higher Age Groups HAG | | | | | | |
| UJEP | A = Bc. Philology (TT, 1Y, FT) | 31 | 55,4 | 11,8 | 48 | 56 | 32 | 84 |
| | B = Bc. Czech Language (nonTE, 1Y, FT) | 22 | 55,6 | 10,7 | 60 | 56 | 40 | 76 |
| | C = Bc. Physical Education (TT, 1Y, FT) | 12 | 51,7 | 11,5 | 52 | 54 | 32 | 64 |
| | D = Bc. Special pedagogy (nonTE, 1Y, FT) | 25 | 51,0 | 11,4 | 48 | 48 | 32 | 80 |
| | E = Bc. Social pedagogy (nonTE, 1Y, FT) | 29 | 52,3 | 13,4 | 52 | 52 | 16 | 80 |
| | Teacher Training overall | 43 | 54,3 | 11,8 | 56 | 56 | 32 | 84 |
| | nonTeacher Education overall | 76 | 52,8 | 12,2 | 48 | 52 | 16 | 80 |
| | overall | 119 | 53,4 | 12,0 | 56 | 52 | 16 | 84 |
| TUL | F = Bc. non-Informatics (TT, 1Y, FT) | 29 | 49,2 | 12,6 | 44 | 48 | 24 | 76 |
| | G = Bc. Informatics (TT, 1Y, PT) | 8 | 52,0 | 13,3 | 44 | 46 | 36 | 76 |
| | H = NMgr. Informatics (TT, 1Y, FT) | 5 | 63,2 | 7,3 | 56 | 64 | 56 | 76 |
| | overall | 42 | 51,4 | 13,0 | 44 | 48 | 24 | 76 |
| UNIBA | I = Bc. Special pedagogy (nonTE, 1Y, FT) | 37 | 54,4 | 9,6 | 52 | 56 | 32 | 76 |
| | J = NMgr. Special pedagogy (nonTE, 1Y, FT) | 34 | 56,4 | 14,3 | 52 | 56 | 16 | 76 |
| | overall | 99 | 55,6 | 13,1 | 52 | 56 | 16 | 84 |

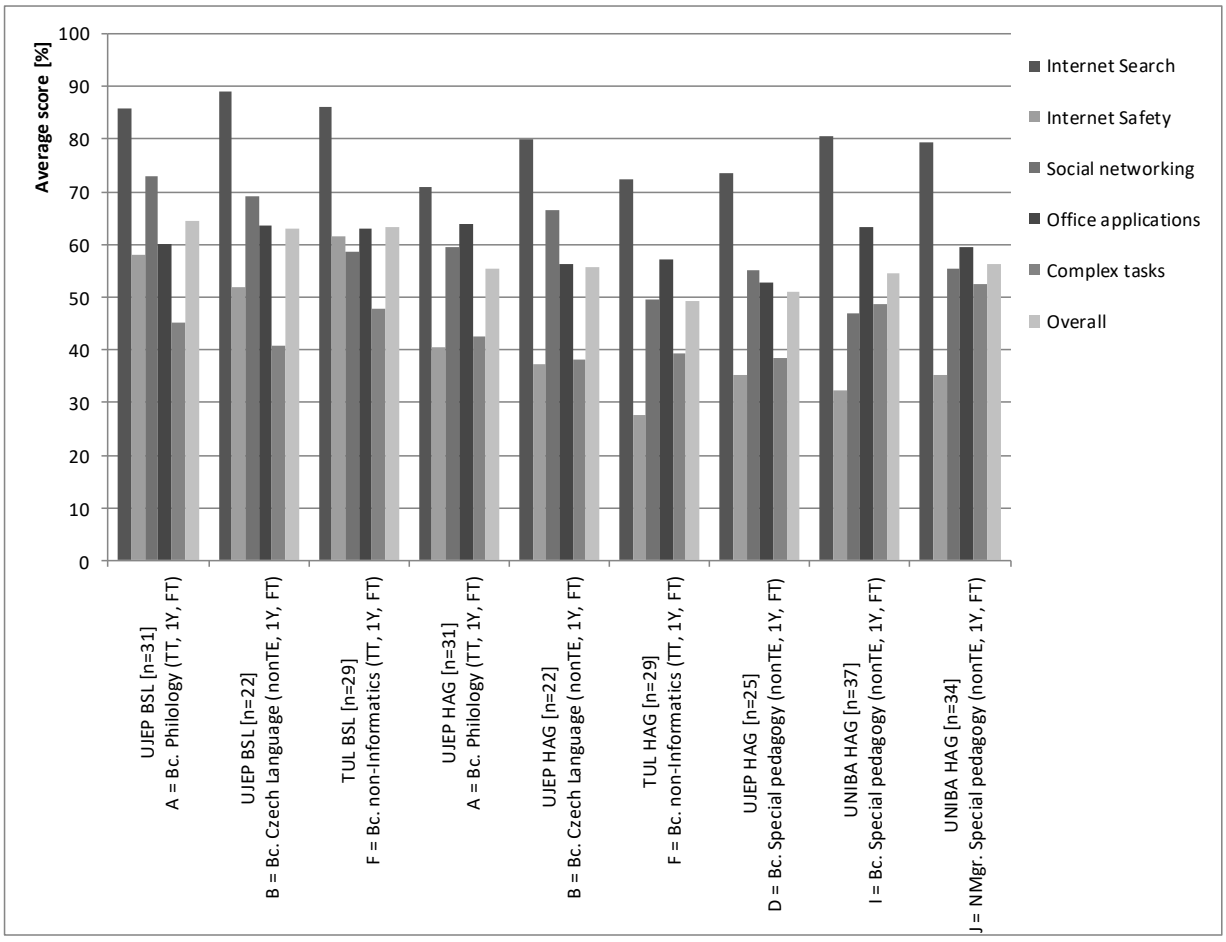


***Figure 2*** *IT Fitness Test 2015 – relative scores in test sections*

***Table 2*** *IT Fitness Test 2015 – results of prospective teachers and special educators*

| | IT Fitness Test 2015 | BSL: A = Bc. Philology (TT, 1Y, FT) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | section | sum of particip. [n] | average score [%] | standard deviation [%] | modus [%] | median [%] | min. score [%] | max. score [%] |
| UJEP | Internet Search | 31 | 85,8 | 16,2 | 80 | 80 | 40 | 100 |
| | Internet Safety | | 58,1 | 25,1 | 60 | 60 | 20 | 100 |
| | Social networking | | 72,9 | 21,3 | 60 | 80 | 40 | 100 |
| | Office applications | | 60,0 | 22,7 | 60 | 60 | 20 | 100 |
| | Complex tasks | | 45,2 | 26,9 | 40 | 40 | 0 | 100 |
| | Overall | 31 | 64,4 | 12,4 | 60 | 68 | 36 | 84 |
| | | BSL: B = Bc. Czech Language (nonTE, 1Y, FT) | | | | | | |
| | Internet Search | 22 | 89,1 | 10,0 | 80 | 80 | 80 | 100 |
| | Internet Safety | | 51,8 | 25,3 | 60 | 60 | 0 | 100 |
| | Social networking | | 69,1 | 26,1 | 60 | 70 | 0 | 100 |
| | Office applications | | 63,6 | 16,7 | 60 | 60 | 40 | 100 |
| | Complex tasks | | 40,9 | 20,4 | 60 | 40 | 0 | 80 |
| | Overall | 22 | 62,9 | 11,1 | 60 | 62 | 44 | 84 |
| | | HAG: A = Bc. Philology (TT, 1Y, FT) | | | | | | |
| | Internet Search | 31 | 71,0 | 22,6 | 80 | 80 | 20 | 100 |
| | Internet Safety | | 40,6 | 22,4 | 40 | 40 | 0 | 80 |
| | Social networking | | 59,4 | 22,4 | 80 | 60 | 20 | 100 |
| | Office applications | | 63,9 | 19,3 | 60 | 60 | 40 | 100 |
| | Complex tasks | | 42,6 | 25,3 | 20 | 40 | 0 | 100 |
| | Overall | 31 | 55,4 | 11,8 | 48 | 56 | 32 | 84 |
| | | HAG: B = Bc. Czech Language (nonTE, 1Y, FT) | | | | | | |
| | Internet Search | 22 | 80,0 | 19,1 | 80 | 80 | 40 | 100 |
| | Internet Safety | | 37,3 | 27,2 | 20 | 40 | 0 | 80 |
| | Social networking | | 66,4 | 25,1 | 80 | 80 | 0 | 100 |
| | Office applications | | 56,4 | 18,7 | 60 | 60 | 20 | 100 |
| | Complex tasks | | 38,2 | 19,0 | 40 | 40 | 0 | 80 |
| | Overall | 22 | 55,6 | 10,7 | 60 | 56 | 40 | 76 |
| | | HAG: D = Bc. Special pedagogy (nonTE, 1Y, FT) | | | | | | |
| | Internet Search | 25 | 73,6 | 21,0 | 60 | 80 | 40 | 100 |
| | Internet Safety | | 35,2 | 17,2 | 40 | 40 | 0 | 60 |
| | Social networking | | 55,2 | 21,4 | 40 | 60 | 20 | 100 |
| | Office applications | | 52,8 | 16,9 | 60 | 60 | 20 | 100 |
| | Complex tasks | | 38,4 | 21,9 | 40 | 40 | 0 | 80 |
| | Overall | 25 | 51,0 | 11,4 | 48 | 48 | 32 | 80 |
| TUL | | BSL: F = Bc. non-Informatics (TT, 1Y, FT) | | | | | | |
| | Internet Search | 29 | 86,2 | 21,8 | 100 | 100 | 20 | 100 |
| | Internet Safety | | 61,5 | 25,9 | 80 | 80 | 20 | 100 |
| | Social networking | | 58,5 | 30,5 | 20 | 60 | 20 | 100 |
| | Office applications | | 63,1 | 22,5 | 80 | 60 | 20 | 100 |
| | Complex tasks | | 47,7 | 27,3 | 60 | 60 | 0 | 100 |
| | Overall | 29 | 63,4 | 18,1 | 60 | 68 | 24 | 96 |
| | | HAG: F = Bc. non-Informatics (TT, 1Y, FT) | | | | | | |
| | Internet Search | 29 | 72,4 | 17,7 | 80 | 80 | 40 | 100 |
| | Internet Safety | | 27,6 | 19,2 | 20 | 20 | 0 | 60 |
| | Social networking | | 49,7 | 25,0 | 40 | 40 | 0 | 100 |
| | Office applications | | 57,2 | 21,5 | 60 | 60 | 0 | 100 |
| | Complex tasks | | 39,3 | 19,3 | 40 | 40 | 0 | 80 |
| | Overall | 29 | 49,2 | 12,6 | 44 | 48 | 24 | 76 |
| UNIBA | | HAG: I = Bc. Special pedagogy (nonTE, 1Y, FT) | | | | | | |
| | Internet Search | 37 | 80,5 | 15,8 | 80 | 80 | 40 | 100 |
| | Internet Safety | | 32,4 | 22,0 | 40 | 40 | 0 | 80 |
| | Social networking | | 47,0 | 27,2 | 60 | 60 | 0 | 100 |
| | Office applications | | 63,2 | 20,5 | 60 | 60 | 20 | 100 |
| | Complex tasks | | 48,6 | 22,1 | 40 | 40 | 0 | 100 |
| | Overall | 37 | 54,4 | 9,6 | 52 | 56 | 32 | 76 |
| | | HAG: J = NMgr. Special pedagogy (nonTE, 1Y, FT) | | | | | | |
| | Internet Search | 34 | 79,4 | 22,0 | 80 | 80 | 20 | 100 |
| | Internet Safety | | 35,3 | 24,3 | 20 | 40 | 0 | 80 |
| | Social networking | | 55,3 | 23,8 | 60 | 60 | 0 | 100 |
| | Office applications | | 59,4 | 17,1 | 60 | 60 | 20 | 80 |
| | Complex tasks | | 52,4 | 23,8 | 60 | 60 | 0 | 100 |
| | Overall | 34 | 56,4 | 14,3 | 52 | 56 | 16 | 76 |

**Conclusions**

In the Czech schools, information and communication technologies are not used at a level required by the needs of the modern information society, in accordance with the actual results of the educational research and global trends in the world. There are exceptions in the positive as well as negative sense. Respondents can be found in the whole range of e-skills—from individuals without functional digital literacy to people with excellent ICT competencies. It seems that the Master degree graduation leads to an improvement in the e-skills, but this improvement is not significant enough. This may be due to the relatively rapid obsolescence of user ICT knowledge and skills or by preserving/fixing digital skills and knowledge at the secondary school level.

It was found that all participants including prospective teachers have significantly bad results in the area of internet safety, the vast majority of students do not know the principles of digital safety what they cannot teach their pupils. That seems to be an important problem in the education of pupils with special education needs because pupils with SEN are a risk group due to the limitations of their disabilities.

It must be clearly stated that the detraction of systematic and comprehensive training in the field of digital technology leads to the worse knowledge and skills of ICT users and negatively reflects in their digital competence.

From this perspective, it is necessary to support activities aiming to improve the quality of ICT training of prospective teachers, both in terms of general digital knowledge and skills, and in terms of making better use of ICT in didactics. Results of the IT Fitness test is just another argument for the full implementation of the Strategy for Digital Education 2020 in the Czech Republic, which states: "*It seems that a relatively large investment in teacher training in the use of digital technologies has not a whatsoever effect, because the newly acquired skills in the use of digital technologies are not applied in practice. This is probably due to the fact that the effective use of digital technologies is not supported nor included in our curriculum nor in the career system. The interconnection of different learning environments is still not used in education—it can be a school or class, but also a home, a virtual online environment, various forms of informal learning (in peer groups, in leisure, etc.). Just outside the school environment, the digital technology is used commonly and often in the inspiring ways the school education would benefit from*."

Beyond that above stated, it seems that relatively poor results of the IT Fitness test can be probably caused by both ineffective application of technology in the teaching practice and a formalism in teacher training in ICT skills, which leads to an illusory improvement of digital knowledge and skills of teachers without a relevant impact on their functional digital literacy.

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# The Use of Video in a Teacher Training Course to Promote the Correct Use of Formative Assessment for Improving Mathematics Teaching and Learning

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**Abstract**
In the last years the teachers' professionalism is an important topic of international research; this has been central in the matter of teacher training, as a strategic factor to improve the national educational systems.
In particular, a good part of the scientific debate about teachers training activities seems to focus on a fundamental “crux” given by the relationship between theory and praxis, between knowledge and competences, i.e. by the research of how to train the teachers in such a way to get that the information they gain will really develop into new behaviours and competences that will enter into play in their everyday teaching practices.
There are several different contributes to this debate, based on interdisciplinary studies, that seem to validate the idea that a fundamental step for the professionalization of teachers is the identification of the most suitable ways to *conceptualize* their explicit practices in teaching by means of recursive processes, integrated and interdependent among them (observation, comprehension, anticipation or prediction of what happens and can happen after a specific action).
From these premises some indications derive about the most effective methodologies to promote the co-presence of theory and praxis in the teachers training (both in-service or pre-service). Such are many techniques that can be based on the use of specific support tools, such as, in particular, the videos.
Several studies, moreover, confirm the effectiveness of video-based interventions in the teachers’ training: the video becomes a tool which is able to integrate and support, via the visual activity, the direct observation and the learning of good teaching practices of which, otherwise, there could only be a description, oral or written.
Following these ideas, our project of research is aimed at the elaboration of a pilot model of a course for mathematics teachers that should integrate and use the analysis of videos made in class with teachers involved in the project with different modalities.
The project of research is the LLP Comenius "FAMT&L - Formative Assessment in Mathematics for Teaching and Learning" and it is aimed to promote the use of formative assessment in teaching mathematics to students aged from 11 to 16.
The research started in 2014 with an observational study carried out by a plan of systematic observations of teachers' behaviour in the classroom with the help of video recording. Thanks to a specific tool of video analysis (a structured grid), developed using indications from international literature and experiences of teacher training in the five Partner countries involved (Italy, France, Holland, Switzerland and Cyprus), we managed to gather many different indicators on good and bad practices of formative assessment carried out by Mathematics teachers.
A significant number of analysed video sequences have been archived in a web repository, integrated with a e-learning platform in which will take place videos and other materials which could be used in several different activities (in presence or in distance), such as: activities of self training (for expert teachers) or training activities, where teachers are guided using analysed videoes to promote development of assessment skills.
This paper presents the main activities designed for Italian teachers to be used in the training course, which, integrating the use of videos, tools and activities for reflection, can hopefully lead to a change and an improvement in their teaching.

**Keywords:** teacher training, formative assessment, se of videos, theory and praxis

**The Teacher Professionalism Between Theory and Practice**

The research which I refer to in this paper wants to insert itself in the current international debate on teacher professionalism (Anderson 2004; Perrenoud et al. 2006; Darling-Hammond and Bransford, 2007; Koster and Dengerink 2008; European Commission 2002; OECD, 2012; UNESCO 2005) and on their training as a strategic factor to improve the national educational systems (see Richardson and Placier 2002; Darling-Hammond et al. 2007; Coggi 2014).

In this debate a very important role is assumed by the relationship between theory and praxis, between knowledge and competences, and in particular the attention is on how to get that the information obtained will really develop into new behaviours and competences that will be activated in their everyday teaching practices.

In this line of thought, it is particularly relevant the concept of recursivity between theory and praxis, meaning an alternation between distinct (but at the same time interrelated) steps in a specific learning process (Altet 2003) which are able to translate theoretic knowledge and methodology into action and also, at the same time, reflection on the action itself (a reflection that, in turn, becomes new knowledge, and so forth).

Many interdisciplinary studies have aimed to point out the crucial factors in teaching behaviours in order to valuate and promote effective teaching methods. In these studies seems to be already validated the idea that a fundamental aspect of the professionalization of teachers can show how they manage to conceptualize their teaching practices and the recursivity (Seidel and Stürmer 2014).

When it is, in particular, an in-service training, which aims to modify certain conceptions and certain practices of teachers, care should be taken to the fact that change is difficult and possible only when the person in training can cause distress to their beliefs through the comparison and testing of alternative methods of teaching. In these cases, it is very important to promote change through:

- the constant reference to the concept connection between theory and practical experience in classroom settings (Doyle 1979), where the theory acquires meaning only when read through the lens of their own personal and professional experience;
- the *new* concepts must be: intelligible, plausible, fruitful in that they must highlight a real advantage and a relapse in actual practice (Tyson et al. 1997);
- the previous misconceptions must turn out unproductive, i.e. it linked to ineffective actions and it is necessary to test even the smallest actions consistent within contexts.

In any case, the centrality assumed by the thoughtful and systematic thinking on and practice (from Dewey to Schön) must be clear and recognizable as well as the restructuring of thought through observation of inconsistencies and discrepancies.

From that, several indications result about the most effective methodologies to promote the co-presence of theory and praxis in teachers training (both in-service or pre-service) and about many techniques that can be based on the use of specific support tools, as, in particular, the videos.

**The Use of Video in Teacher's Training**

Methods that make use of video in training are classified as "media education" and in particular those which are addressed to teachers can be distinguished depending on the specific use that is made of the video itself (Masats and Dooly 2011):

- as both an object and a tool for observation and analysis, to show a subject to the teachers (we speak of *video-viewing*, in this case);
- as an example or display, when the video shows the practices and the behaviour of experienced teachers in specific situations (*video modelling*);
- as a record of teachers themselves, which is shared with the others, making it an occasion of comparison and debate with colleagues or with a trainer (*video coaching*).

Content, length, aim of a video can be various. For example, a video can be presented as an example of everyday teaching activity (Carbonneau and Hétu 2006), or as a "best practice" which rarely could be directly observed, or as a specific experience or experimentation (Santagata and Guarino 2011).

Anyway, many studies seem to confirm that the video-based interventions in the training of teachers are very effective: videos are used as a tool able to integrate and support, via the visual activity, the direct observation and the learning of good teaching practices (Santagata, Zannoni and Stigler 2007).
For instance, we can refer to a technique actually used, based on experiences made in the ’60-’70's by K. Romney and D. Allen at Stanford University (Allen 1967). This is the technique of *microteaching* which consists mainly in having the trainee teacher to present to a small group of students a short time teaching session, concentrated on a specific subject. The short session is monitored by trainers which use video recording as main tool. The trainees, analysing a teaching sequence, can reflect asking themselves about the abilities which will help them to solve a specific problem in a the teaching practice and on the errors they can do in their activities. Such an analysis can promote and facilitate a reflexion on what is done in the class, which contributes to an improvement of the teaching practices. The purpose of the technique is to encourage the mastery of techniques and teaching practices through simulation and refine observation skills and educational performance analysis.
From an initial behavioural model type, afterwards microteaching received indications from the cognitivist directions, for example also concerning the methods of decision-making and development of the teacher's thinking, and landing on the issues of reflexivity (Schön 1993) given by the opportunities for the teacher to be able to "look in the mirror" and assessing the "educational situation in its entirety" (Calvani, Bonaiuti, and Andreocci 2011, 31). Trainees and student teachers refine their ability to reflect, being encouraged to describe, explain, critically examine the educational performance of their own and others.
The complexity of such actions is also highlighted in reference to the context and the target, the development of a just communication, the use of the most suitable teaching devices, in the choice of teaching strategies themselves.
The use of video recording allows that a group of trainee teachers can observe and analyze the same lesson together, exchanging reactions, ideas, motivations and reflections which is typical of communities of practice (Wenger 2006). The same recording can then be used for self observation also repeated at a distance of time.
In this direction it also moves the lesson analysis model (Santagata, Zannoni ans Stigler 2007) which starts from the assumption that through a careful analysis of the their pupils learning and the specific situation activated in the teaching-learning process, teachers can learn a lot from their daily work in the classroom and then from their practice itself (Sherin 2007).
A number of studies also show how teachers can learn through the sharing of teaching thinking processes and strategies on specific effects on their students learning with other teachers and experienced teachers.
"Lesson Analysis Framework" model leads to integrated analysis of three fundamental elements of the teaching / learning process: the teacher (his/her actions and activities created for his/her pupils) the students (what they say and what they do); the discipline (concepts and procedures that make up the lesson objective). It has been demonstrated that the lesson analysis so conducted leads teachers to the development of new knowledge and, even in this case, the use of a video recording allows the application of this analysis to their teaching practices.
Several studies and experiences, show that the video training is also useful in learning experiences as laboratories or workshops, especially to improve the teaching skills of knowing how to learn through reflection, discussion, interpretation and finally to share meanings (Perrenoud et al. 2006; Goldman. 2009).
In general, therefore, the use of video practices in initial training and for in-service teacher (Pasquay and Wanger 2006) are inserted either at the time of the transformation of the theory into practice and in the transformation of the practice experienced in theoretical knowledge (Mottet 1997).

Anyway, it is also important that this use takes place within a well structured educational path, characterized by:

- a clear and thought over choice of the learning objectives that one wants to achieve with the trainees teachers (Blomberg et al. 2013; Seidel et al. 2011; Rossi et al. 2015);
- the production or selection of the videos best suited to the defined objectives;
- a good support and guide to the vision, comprehension and analysis of the video;
- elaborating suitable tools for evaluation, appropriate to the objectives (Calvani et al. 2014).

Following these ideas, the FAMT&L project (see in the next paragraph) aims to the elaboration of a pilot course for Mathematics teachers that can be followed in part as a distance course and in part face to face. Such a course should integrate and use the analysis of videos made in class with teachers involved in the project with different modalities, but all oriented to the achievement of specific formative targets for their acquiring specific skills in the use of formative assessment as an element that improves the quality of teaching..

**The Pilot Course for the Teacher in Service Training in the European Project FAMT & L**

***The Project***

The European Project (LLP Comenius), which I refer to, is a 3 years project aimed to promote the correct use of FA in the classroom, specifically in teaching mathematics, with students aged from 11 to 16 years old. This project "FAMT&L" (Formative Assessment in Mathematics for Teaching and Learning) involved five European Universities as member partners: the Alma Mater Studiorum University of Bologna in Italy, the University of Applied Sciences and Arts of Southern Switzerland, the University of Cergy-Pontoise in France, the University of Cyprus, and the Netherlands' Hogeschool Inholland.

The research started with observational studies and surveys in order to understand analytically Maths teachers' and students' beliefs and practices (Michael Chrysanthou and Gagatsis, 2015). In this way it has been possible to detect training needs to design specific courses aimed at promoting a correct use of methodologies and tools to conduct correct formative assessment activities.

During the first explorative phase of the work, with the administration of questionnaires about beliefs and practices on assessment, we also conducted some case studies, with the help of video recording, to develop and try out an observational tool (a structured grid) to analyse assessment practices in the classroom.

In the second phase, research group has carried out a systematic observation study on a larger sample of video sequences of teachers in the five Partner countries involved with the use of a specific tool. The tool was defined by using indications from international literature and experiences of in-service training and it is useful to gather many different indicators on good and bad practices for the formative assessment of Mathematics teachers (e.g. their habits about gathering information on the students' learning process, correcting errors and using feedback to support learning). With the videos collected about formative assessment situations, researchers created a web-repository and designed a training program based on the use of such repository aimed to promote formative assessment in the practices of in-service Math teachers.

The videos collected consist in recordings of real class situations, when teachers were performing assessment practices, such as the administration of a test or a task to students, the conduction of a written, oral or practical task; the reflection on the mistakes that were made in a test; the correction of an assigned task (in group, individual or in pairs); the teacher's formative feedback during the work on an individual exercise, and so on.

From the "long" videos, a number of short video-sequences were obtained: they have became the main training tool for the pilot course. With the use of a grid for the video analysis researchers obtained a scheme that allowed a meta-dating of each sequence and so a system of annotating the videos that had facilitated their storing in the web repository. These systematic processes should give an easy way to find specific materials in the repository, and also to integrate them into "pilot" training courses

which should be a guide to promote a correct use of formative assessment as a tool to improve the teaching of Maths.
Such courses are aimed to the acquirement of specific skills in the use of formative assessment as an element that improves the quality of teaching. In these courses suggestions coming from the contemporary debate on teacher training will be integrated. It states that the observation by the teachers of their own practices would allow them to change their behaviour by themselves and encourage processes of reconsideration on assessment and teaching.

***The Pilot Course: Training Model, Activities, Monitoring and Tools***

The common application model is created by defining a series of essential elements that should be contained within each pilot course.
In particular each partner, during the course, would have to use the evaluation-monitoring instruments in a well-defined moments (before, during and after the course). In specific, the tools used at the beginning and at the end of the course have common elements to allow a comparison between the results.
From a methodological point of view it has been important to establish that, in all the courses, there have to be moments of discussion and reflection of teachers on video and on the construction of the formative evaluation concept using video and the web repository then. Another important aspect is given by the traceability of the change of convictions and beliefs in the process of teachers' educational innovation. This has been done through the use of grids to detect significant points concerning teachers' opinions on formative assessment.
In general, the training program is based both on teaching general knowledge related to didactic design and assessment practices, and on specific knowledge of Mathematics education, with particular regard to formative and summative assessment, and assessment *for* learning. In fact, we think that the appropriate use of correct FA methods and techniques is a key element to make Mathematics teaching more effective and innovative.
Using the common template for all project partners we now intend to represent more details on the pilot course designed for the Italian pilot course. Characterizing elements are given by the arrangement of learning activities combining the theoretical content and teaching. Practical contents are founded on direct experience to action and reflexive processing accompanied by the intervention of university teachers, supervisors, mentors or critical friends (teachers experts and already partly trained on the topic participating in the course as critical friends). Proposals for communication, analysis, discussion and reflection centred on issues related to the development of evaluation practices, the development of data collection tools, the preparation of concrete experiences and practices, the path documentation are being tested through a number of stimuli and reflections / discussions shared and applied in the virtual environment.
All these activities, however, are not sufficient to give life to the experience of change in the evaluation practices of the teachers concerned. Therefore, it is particularly important that they are accompanied and supported by instruments and figures to serve as guidance and orientation. Recent researches have shown the critical role of driving figures or mentoring to stimulate learning "*from"* and *"in"* the experience, highlighting how the professional performance improve when teachers are supported by a guide emphasizing on the connections with their previous experience (Filliettaz 2014).
In this sense it is also important to emphasize the use of strategies and methods drawn by research experiences that show how the video recording for educational practices becomes even more incisive if intertwined reflection and dialogue provoked by questions-stimulus guided by a researcher / facilitator or by the use of tools such as drills and tasks with questions stimulation or learning diaries that guide the subject to a meta-cognitive level.
To this purpose, we propose two examples of the required activities that accompany teachers throughout the course.

*Learning diary*

The activities of reflection is guided both by the recall of theoretical materials and / or used in activities in the presence (and therefore with the supervision of the teacher of the course and the tutors in the classroom), and through some questions stimulus to draw attention to part of the students about their own experiences and the convictions that dictate their assessment practices.

Another element of aid is given by the request to make an assessment of the activity in terms of acquiring of knowledge and abilities and specific skills development, but also through the awareness of the strengths and difficulties that have characterized the conduction of the specific activity.

*Individual or in group activities*

As in the diary, the activities to be carried out individually or in groups (in the classroom or at a distance) require critical reflection by the students on what they usually do in the classroom or on the beliefs influencing their assessment practices. In the classroom the students are divided into small groups who, with the help of the teacher and a tutor, perform specific activities and then, at the end of the lesson, share with other groups the ideas that are emerged.

As can be noted, there is the reference to video, analysed or to be analysed, which shows the integration of the videos themselves and repository in the didactic path with all the methodological elements explained above.

**Detect Changes Through Monitoring**

As mentioned above, to measure the effective change in teachers' assessment practice participating in the course, the European partners have defined a specific evaluation model of the course.

Effective evaluation of a training is seen as an important step for different reasons:

Reflection ensures a higher standard of the training course thanks to structured feedback and consequent adaptation of model and materials;

In the development of a training the direct feedback of participants, being the trainer and trainees, are most likely not received;

It can create a higher commitment from future participants.

During the development of the training course and web-repository in the FAMT&L project a strategy was put in place for evaluation based on five steps. The fifth and final form of evaluation is the evaluation of the pilot training course:

It is important that the results are defined in measurable terms so that, all people involved, can see the ultimate destination of the initiative. Clearly defined results will increase the likelihood that resources will be used most effectively and efficiently to accomplish the mission.

Adopting the Kirkpatrick model (Kirkpatrick 1959) we designed a specific plan to evaluate and validate the course model. In particular, specific evaluation instruments have been designed, as some questionnaire to be administrated before, during and after the training path. These tools are common for all partners but everyone was able to choose whether to add specific questions to detect, for example, opinions and beliefs on specific topics of the school.

In order to illustrate briefly phases and instruments used, the following scheme presents steps, aims and a brief description of tools used for monitoring Italian course.

| Objects and aims | Time | Tool | Common (Used in each Country) |
|---|---|---|---|
| Questions about beliefs and conceptions on assessment and about teachers' assessment practices | Before beginning of the Course | Questionnaire | X (some section in addiction: opinions on certain statements regarding educational issues and drawn from interviews with teachers) |
| Evaluation of training: Acquisition of knowledge and skills, achievement of objectives | During | Evaluation form | X |
| Evaluation of training path and experiences (by trainer and trainees) | At the end of the course | Evaluation form | X |
| Questions about beliefs and conceptions on assessment and about teachers' assessment practices. To detect changes of opinions | At the end of the course | Questionnaire (in part as the initial questionnaire) | Italy |

All the actions concerning the evaluation strategy implemented in the project will allow us to get a clear picture on the organizational validity, discipline, teaching and methodology of the implemented course design and, then, on the transferability of the it in other contexts.

**Conclusion**

We would have shown data collected from surveys or specific cases of activities carried out with the Italian trainees, but for administrative problems, the pilot course has been delayed unexpectedly, and currently it has just started.

However this paper presents some activities that will be proposed to stimulate critical reflection by participants on their experiences in the classroom which has been previously carried out or that are going to be carried out in the future in order to promote real improvement in their evaluation practices and, therefore, of their teaching in general.

At the moment, the repository and the platform can be accessed only by the researchers working within the project and by the teachers in training. As soon as the number of videos and other material will be increased to be a valuable support for formative teachers activities of several countries, the repository will become public, to be used in new and other courses for teacher in-service or pre-service.

In this contribution it has not been possible to discuss beyond the whole course of study and research that has produced important results such as the testing of innovative training methods to promote change in the convictions of teachers who may have a relapse into their teaching practices.

The intention of the researchers is to keep on monitoring the teachers involved in such training model to test actual changes in assessment practices. This could allow to validate the training model tested in order to make it transferable to other contexts (teachers from other school levels and other disciplines).

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# Professional Development of Teacher Educators

# The Positioning of School Based Teacher Educators as Partners in Initial Teacher Education

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**Abstract**
In initial teacher education (ITE) internationally there is great diversity in school-based experiences. This research explores how teacher educators in schools in England, working in partnership with a Higher Education Institution (HEI), position themselves and identifies some of the impact that this role had on them.

This study took place in the first year of a new route into teaching in England designed by groups of schools with an accredited provider of ITE. The schools may teach academic aspects of professional and subject knowledge, as well as facilitate the student-teachers' school experiences. The involvement of school-based teacher educators (SBTEs) went beyond traditional mentoring. The research question was: how does taking on the newly emerging role as a SBTE, and developing as a second-order practitioner (teacher of teaching, Murray and Male 2005), impact on the teacher, student-teachers and HEI-based teacher educators (IBTEs) in terms of the positioning and professional learning of the SBTE?

Eight of the thirteen SBTEs completed an emailed questionnaire. From these eight, five were selected using purposeful sampling and two took part in an interview as well as two IBTEs who had worked closely with them. Four of the student-teachers shared their experiences in a focus group. This research draws on a phenomenological approach.

The voices of the SBTEs and those working alongside them, gave a deep understanding of the complexities of this role. There were benefits in working in this way for all involved. The SBTEs commonly positioned themselves as learners *from* and *with* student-teachers and as complementary partners with IBTEs. They were developing a range of complex new skills beyond those required as a first-order practitioner (teacher of pupils) and emerging as gate-keepers of professional learning opportunities for student-teachers and their peers.

Although the research participants are from an alternative programme of ITE, their experience in taking responsibility for more of the academic aspects of the student-teachers' learning warrants attention by policy-makers and programme designers, as there are increasing moves towards school-based teacher education internationally. The results contribute to the improvement of teacher education by raising awareness around the impact of executing the role of mentor and academic tutor simultaneously. Where SBTEs were working as mentors, the tendency towards being positioned as 'mentor', even whilst new aspects of the role were being acquired, could have restricted their development. A job title, description and dedicated time for the role would help to provide a more formal structure to school-based teacher education. Without formal recognition much may be expected of these SBTEs, masking the true cost. The European Commission report (2013, p.10) realised that 'failing to define teacher educators' roles and the competencies they require, and the failure to acknowledge all those who play a part in teacher education, can be barriers to educational improvement and innovation'. Where the relationships between SBTEs and IBTEs are developing as complementary partners, the challenge of sharing responsibility and power can be explored, to strengthen the partnership. This could help to overcome the sense of fragmentation in the community of teacher educators.
**Keywords**: teacher educator; initial teacher education; mentor, School Direct

**Introduction and Theoretical Framework**

'Teacher educators are all those who actively facilitate the (formal) learning of student-teachers and teachers' (European Commission 2013, p.8). This occupational group includes SBTEs and IBTEs. SBTEs include teacher mentors and those who deliver some academic aspects of teacher education. The literature focusses primarily on IBTEs who have left school and entered academia (Swennen, Jones, and Volman 2010).

In many Western countries there are policies designed to promote school-led teacher education (Musset 2010; Zeichner 2014). These changes in ITE are shifting the nature of partnership between schools and HEIs and may lead to 'local' professionalisms causing a break-up of traditional provision (Whitty, 2014). The European Commission (2013) expresses disquiet regarding the fragmentation of the teacher educator profession because of challenges to consistency and quality of provision. Collaborative working between schools and HEIs in the provision of high quality ITE could be upset as shifts in the balance of power affect the positioning of partners. We are employing the term 'positioning' because it helps 'focus attention on dynamic aspects of encounters in contrast to the way in which the use of 'role' serves to highlight static, formal and ritualistic aspects' (Davies and Harre 1990, p.43). Positioning involves the ongoing construction of self-identity through talk.

**Research Questions**

'Teacher tutors' were studied during the first year of School Direct, a new route into teaching in England. School Direct programmes are designed by groups of schools with an HEI or another accredited provider of ITE. Schools recruit their own student-teachers and agree the focus and outcomes of the programme. SBTEs may be involved in academic teaching, as well as facilitating the school experiences for the student-teachers. In this programme the SBTEs of interest were called 'teacher tutors'; they taught sessions with student-teachers in small groups or individually. Some had a mentoring role for the student-teacher that they were tutoring; in other cases they were not currently mentoring any student-teacher on the programme. Two were professional mentors carrying the responsibility for overseeing ITE within their school. Those who were solely teacher mentors have not been included in the research so that a direct comparison can be made between these SBTEs and the IBTEs, where a similar postgraduate teaching role rather than a mentoring role predominates. The research questions were: how do the SBTEs position themselves in relation to student-teachers, colleagues and IBTEs? And how does this link to the professional learning that they have identified as occurring whilst they have been developing as SBTEs?

Initial findings from this data have been published (White, Dickerson and Weston 2015) focussing on the impact that this role had on SBTEs and some of the benefits and challenges they faced.

**Research Methods**

***Research Participants***

This research was carried out in a University School of Education in England. All thirteen of the teacher tutors (SBTEs) engaged in the programme were invited to participate in the project. Eight tutors (62%) responded to an emailed questionnaire; three men and five women (Table 1). One respondent was a primary teacher and seven were secondary teachers. The respondents' prior experience included leadership roles within their school, or across schools, in relation to professional learning; quality assurance of ITE; subject knowledge support and mentoring. Some had no prior experience in leading the professional learning of teachers/student-teachers. The respondents included teachers with each of the three SBTE 'sub-roles': teacher tutor (all); professional mentor; and teacher mentor (Table 1). From these eight respondents, five were selected as *'information-rich cases* for study in depth' using purposeful sampling (Patton 2002, p. 46, emphasis in original). The criterion for the selection of these five was that they were identified as participants from whom 'one can learn a great deal about issues of central importance to the purpose of the inquiry' (Patton 2002, p. 230).

Two of the five teacher tutors took part in the telephone interview (Sofia and Mark). Two IBTEs who had worked closely with these SBTEs were interviewed face-to-face (Graeme and Jodie). Eight student-teachers were invited to a focus group to share their experiences as part of this first cohort of School Direct, being taught by both SBTEs and IBTEs. Four attended the focus group. In total, fourteen participants contributed to the research. As Patton (2002, p. 46) explains 'While one cannot generalize from single cases or very small samples, one can learn from them – and learn a great deal, often opening up new territory for further research…'.

***Research Approach***

This research draws on a phenomenological approach to develop an understanding that involves sensitivity to the uniqueness of the participants and their particular situations (van Manen 2003). For this reason 'the closer the researcher is to the phenomenon under study, the more accurate and valid their interpretation is likely to be' (Davey 2013, p.34). In qualitative research, (Finlay 2002, p. 531) suggests that research is seen 'as a joint product of the participants, the researcher, and their relationship: it is co-constituted'. In this case the lead researcher, an IBTE, who leads the School Direct programme, had experience of working with the programme and the participants. The lead researcher played a significant role in the research design including the development of the data collection instruments, and in data analysis and interpretation. Researchers unknown to the participants conducted the interviews and focus group in order to reduce any impact that a perceived imbalance of power between the lead researcher and the participants might have on the research.

***Data Collection and Analysis***

Data were collected using self-completion questionnaires; semi-structured interviews of selected teacher educators; and a focus group involving student-teachers. The questionnaire and cover email were piloted before sending it to the SBTEs. The responses were used to develop the questions for the interviews with SBTEs. Again, the interview schedule was piloted and the findings used to revise the questions. Finally, the interview schedule was adapted for use with the IBTEs. The participants' were asked about who should be involved in preparing teachers; the multiple roles held by teacher educators in their workplace; their role as a teacher tutor (SBTE only), or supporting a teacher tutor (IBTE only); professional learning for the role of SBTE; benefits of the role; conflicts of interest/complementarity of roles held by the participant; and their sense of professional identity as a teacher educator (SBTE only). Open-ended questions were used to obtain data that would emphasise 'the meanings, experiences, and views of all the participants' (Pope and Mays 1995, p. 43). The interviews were recorded and partially transcribed to develop 'key points' that included some text as paraphrase/note form as well as verbatim quotations.

The interview findings were compared to the questionnaire responses and the focus group discussion. Consistencies between the data supported the trustworthiness of the responses (Yin 2009). The interviews were planned with the intention to benefit all involved (Cohen, Manion, and Morrison 2007). The nature of the questions and the desire to build a mutually safe and supportive environment gave interviewees some power over what was discussed.

The lead researcher repeatedly read the data texts, initially grouping the data according to areas of questioning before carrying out 'categorizing analysis' (Maxwell 2013, p. 107). During the first stage of categorization, data relevant to each of the categories derived from the research question (positioning, professional learning, and professional skills development) were highlighted for closer scrutiny. These categories served as 'organizational categories' that were useful for sorting the data that were of interest for further investigation (Maxwell 2013, p. 107). Following this preliminary sorting, the highlighted data were explored in greater depth and placed into 'substantive categories', which were 'primarily *descriptive'* and closely related to the data (Maxwell 2013, p. 108, emphasis in original). The process of repeatedly re-visiting the data led to new insights emerging.

**Results**

***The Positioning of SBTEs***

As all of the SBTEs are situated in the school where they work as a first-order practitioner, both how they position themselves in relation to others who are involved in teacher education (reflexive positioning); as well as how others position them (interactive positioning) (Davies and Harre 1990) was considered. The reflexive position expressed by all of the SBTEs who were also working as a mentor was that of mentor (Table 1). This could correlate with the role of coach identified by Lunenberg, Dengerink, and Loughran (2014) as one aspect of being a teacher educator. In Sofia's interview she shared that it is 'hard to differentiate it [working as a teacher tutor] from having been a mentor for [X] years'. From the questionnaires and interviews, all the SBTEs were focussed on meeting the learning needs of the student-teachers. Those who were mentors as well as leading academic aspects of the programme did not distinguish the academic leadership as separate from mentoring whilst identifying themselves with the familiar title and position of 'mentor'.

*Table 1. The participants, roles and positioning*

| Teacher Educator | | Age phase | Professional roles | | Teacher tutor | Positioning | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Mentor | Learning *from* and *with* student-teacher | Complementary partner | Gate-keepers of professional learning opportunities |
| Francesca | SBTE | Primary | - | Mentor | 1:1 | * | * | * | |
| Peter | SBTE | Secondary | Subject Leader | Mentor | 1:1 | * | | | |
| Sara | SBTE | Secondary | Subject Leader | Mentor | 1:1 | * | | | |
| Sofia | SBTE | Secondary | Subject Leader | Mentor | 1:1 | * | * | * | * |
| John | SBTE | Secondary | Subject Leader | Mentor | Group | * | * | * | * |
| Tracy | SBTE | Secondary | - | Mentor | Group | * | * | * | * |
| Mark | SBTE | Secondary | Subject Leader | - | Group | | * | * | * |
| Pooja | SBTE | Secondary | - | - | Group | | * | * | * |

Peter and Sara did not appear to position themselves beyond being a mentor. However, all of the other SBTEs also positioned themselves as a learner *from* and *with* the student-teachers (Table 1), which may reflect an inquiry approach to teaching teachers. This was coupled with positioning themselves at the forefront of new knowledge through their involvement in ITE. This is illustrated by:

> 'as a teacher I have gained a great deal from watching new teachers in the classroom and have used lots of ideas I have seen.' (Tracy)

> 'The opportunities are endless as it keeps you at the forefront of teacher training and therefore new ideas. Trainees often experiment greatly during their training year with different methods and skills they have gained from other teacher observations and research. I feel that perhaps I started to teach in exactly the same way all of the time and fell into the 'comfortable trap' that is so easy to follow. Mentoring does not allow this as you constantly observe others and therefore are far more critical and reflective of your own teaching.' (John)

Those same SBTEs positioned themselves as a complementary partner to IBTEs (Table 1) which links to the role of broker identified by Lunenberg, Dengerink and Loughran (2014). For example:

> 'I can see the benefit of both University tutors and practising teachers. The experience of University staff is invaluable, and adds to the academic rigour of the course, however, practising teachers are more likely to be able to add more personal advice based on their experiences, and may be able to challenge the literature because of this.' (Pooja)

There was a sense in which SBTEs were 'gate keepers' who could invite peers to benefit from professional learning experiences by involvement with student-teachers (Table 1). Francesca did not position herself as a gate-keeper which may have been because she was working in a primary setting. John illustrated that his work benefitted his school through:

> 'passing on ideas and theory during inset/meetings… It encourages the whole department to take note of the way in which they deliver information and engage learners'.

Sofia planned learning opportunities for the student-teacher which she delegated to other colleagues, to broaden the feedback that the student-teacher received. There were indications that SBTEs were gate-keepers for learning opportunities for student-teachers. The term 'gate-keeper' has been used with respect to learning opportunities rather than in terms of entry into the profession, unlike Lunenberg, Dengerink and Loughran (2014).

Although Peter and Sara did not indicate that they were gate-keepers of professional learning opportunities this does not mean that they are not positioning themselves in this way, because the themes arose from the data rather than through direct questioning about these aspects. If differences in positioning do exist, these may be due to differences in prior experience, understanding of the role and confidence in carrying it out. This has implications for the professional learning needs of SBTEs.

In terms of interactive positioning, both SBTEs interviewed were seen as key in developing their subject in school. Sofia felt viewed as a 'go to person' by newly qualified teachers in school regarding their professional development. The school governors and senior leadership team valued the role of Mark in the programme as 'raising the profile of the school and supporting the community'. Graeme saw the SBTE as a subject specialist and a colleague with whom to negotiate a suitable programme and invaluable to 'bounce ideas off'. The SBTEs felt that the student-teachers valued them, and this was backed up by the IBTEs working with them and the student-teachers themselves. The student-teachers appreciated the enthusiasm that the SBTEs had for their training and the subject. They valued their availability, approachability and their understanding of the workplace context. They saw them as insightful practitioners working to support their subject knowledge development. The IBTEs were positioning themselves in a quality assurance role with respect to the subject and professional support provided by the SBTEs 'ensuring the training was providing the right amount of challenge and support' for the student-teachers (Jodie). They also recognised their role as critical friend to the SBTEs, balancing support, encouragement and challenge, to ensure the student-teachers can succeed.

The student-teachers felt that SBTEs generally had autonomy, but that the senior leadership team was often unaware of how much SBTEs do. However the SBTEs did not share this perspective, one

commenting that the senior leadership team valued this role because it raised the profile of the school, supported the school community and helped with recruitment of appropriate subject specialists for the future. Mark commented that 'the wider community like the governors have been quite receptive to what's going on' and that it had been noticed that his involvement in ITE had caused his subject to develop quickly within the school.

***Professional Learning of SBTEs***

The SBTEs were developing complex new skills beyond those required as a teacher (Table 2). All could be attributed to working solely as a mentor, suggesting that professional learning associated with the teacher tutor role may need to be formalised, covering such aspects as explicit modelling, articulating tacit knowledge and underlying theory.

| Developing skills identified: | Comments |
|---|---|
| Lesson observation and feedback | 'I enjoy watching others teach and identifying strengths and areas of improvement. It has helped me to be more involved in observations at school' (Sara) |
| Difficult conversations and dealing with concerns | Having a student-teacher who is a cause for concern can be a 'valuable experience in supporting them back on track' (John) |
| Being a critical friend | 'Need to be challenging but being challenging to a grown-up who is clever and an equal' (Sofia) |
| Modelling good practice | I see my role as 'modelling good practice' (Sofia) |
| Developing subject knowledge and pedagogy | Appreciation that 'the way you look at things you need to break down in a lot more depth' to help the student-teachers to learn (Mark) |
| Brokering learning opportunities | 'I often act as a broker between trainees and other teachers who could learn from each other' (Tracy) |
| Working with adult learners | Seeing them as 'academic equals/peers' (Sofia) |

*Table 2. Developing the skills of second-order practitioners*

Some of the ways that the SBTEs recognised that they were learning professionally included:

- workshops for teacher educators facilitated by the HEI;
- preparing with an IBTE;
- reflecting on their own substantial teaching experience;
- the experience of leading the learning of the student-teacher.

**Discussion**

***The Positioning of SBTEs***

Figure 1 shows the two orders of working in ITE: first-order where the student-teacher and SBTE are teaching pupils and second-order (teaching teachers) traditionally held by IBTEs (Murray and Male 2005) but also by SBTEs through mentoring and/or tutoring. Mentoring spans the first and second-order because it requires first-order expertise to guide student-teachers' development. This illustrates the multiplicity of roles that experienced teachers adopt. Where SBTEs worked as mentors they assumed the reflexive position of mentor. This role was familiar to them and their colleagues, whereas the added dimension of leading the academic learning of student-teachers was a new dimension. The SBTEs who did not currently have the role of mentor did not position themselves in this way. The positioning as a mentor may reflect a reticence to embrace being a teacher tutor, or a difficulty in dis-entangling the two roles. The tendency towards being positioned as 'mentor', even whilst new aspects of the role were being acquired, could restrict their wider development as teacher educators and cause them to rely on practical wisdom rather than public knowledge (Boyd 2014). As a counterbalance, in

this particular programme, the SBTEs were working in close partnership with an IBTE, so that student-teachers were having opportunities to learn from a wide range of experienced practitioners.

| **Position** | **STUDENT TEACHER** | **SBTE** | **SBTE** | **IBTE** |
|---|---|---|---|---|
| **JOB TITLE** | | **Mentor** | **Teacher Tutor** | |
| **First-order practice** | **Teaching pupils** | **Teaching pupils**<br>**(Subject leading)** | **Teaching pupils**<br>**(Subject leading)** | |
| | | **MENTORING** | **MENTORING** | |
| **Second-order practice** | | | **Teaching teachers** | **Teaching teachers** |

*Figure 1. The roles of teacher educators*

The sense of being 'gate-keepers' with respect to learning opportunities between teachers and student-teachers in school illustrates the high value that the SBTEs place on both the learning of the student-teachers and the worth they see in being able to learn *from* and *with* them. It also reflects a sense of care for the professional learning environment for student-teachers and for their colleagues. In their study of a professional development school partnership, Ikpeze et al. (2012) recognised that the SBTEs (in this case as mentors) acted as critical bridges in the partnership between the student-teachers and the IBTEs. Here we find that SBTEs are negotiating another go-between role between the student-teachers and colleagues in school.

As Ikpeze et al. (2012) suggested, rapid change in the nature of partnerships of ITE can challenge effective collaboration among all stakeholders. In this research on a small scale pilot within the new School Direct route into teaching, working during a time of rapid change, there is evidence that some of the SBTEs are positioning themselves as complementary partners alongside the IBTEs, which is a positive indication of collaboration between the partners. The SBTEs see themselves as being at the forefront of developing professional knowledge in teaching. Providing opportunities for SBTEs and IBTEs to work alongside each other and to learn from one another is beneficial for developing new ways of working and to enhance the partnership between school and institution. Mark commented that when IBTEs and SBTEs are working alongside each other, the SBTE 'widens the knowledge and capability' of the IBTE, as well as the SBTE benefitting from the experience and knowledge of the IBTE. Sofia and Mark both felt that their work as an SBTE was valued in their schools, which was not confirmed unanimously by the IBTEs. The student-teachers felt the SBTEs were under-valued in school for the second-order aspects of their work. These findings are ambiguous and may reflect the lack of formal recognition of this work.

***Professional Learning of SBTEs***

The SBTEs interviewed were becoming aware of differences between working with pupils and with student-teachers. The content of their teaching shifted from the school curriculum to learning teaching, bringing similar challenges as those experienced by new IBTEs undergoing the transition from being a first-order practitioner to a second-order practitioner (Field 2012). The intricacies of the work of a SBTE are beyond being a good teacher and include harmonising the demands of developing another professional (O'Dwyer and Atli 2014).

Modelling good practice is integral to mentoring; however it is possible that these teacher tutors may not be explicitly modelling their practice to the student-teachers. This is a complex competency for second-order practitioners to develop (Loughran and Berry 2005), where IBTEs could use their understanding to support the professional learning of SBTEs, for example, through the collaborative mentoring approach developed by van Velzen et al. (2012). This approach can support quality and depth of learning of student teachers in school and provides a way for SBTEs to explicitly model and scaffold learning for student-teachers whilst co-teaching a cycle of lessons.

**Conclusions**

The experience of the teachers in taking on the responsibility for some of the academic aspects of student-teachers' learning warrants our attention as school-based teacher education is increasing. Experienced teachers involved in teacher education are predominantly working as mentors, but more will be developing further as second-order practitioners, whilst maintaining their position as first-order practitioners within their school (Figure 1). This research raises important considerations regarding the impact of executing the role of mentor and academic tutor simultaneously. In considering how the SBTEs position themselves and other individuals involved in the programme and how IBTEs, student-teachers and others position them, we have found indications of collaborative working, reflected in the sense of being complementary partners. However, where these teachers are working as mentors, the tendency towards being positioned as 'mentor' by themselves and by their student-teachers, even whilst new aspects of the role are being acquired, could restrict the development of these SBTEs. As 'reflexive positions are always emerging, changing, and shifting' (Moghaddam 1999, p.77), this positioning of these SBTEs may be a temporary phase whilst they embrace both the role of mentor and teacher tutor simultaneously. Job descriptions would help formalise these positions in school-based teacher education. Without formal recognition much may be expected of these SBTEs, masking the true cost. The European Commission (2013, p.10) realised that 'failing to define teacher educators' roles and the competencies they require … can be barriers to educational improvement'. Where complementary relationships are developing, the challenge of sharing responsibility can be explored to strengthen the partnership. This could help to overcome the fragmentation felt by some in the teacher educator community.

Teacher educators situated in HEIs and teachers situated in school may have different values and attitudes about teaching and teacher education which might lead to importance being given to alternative perspectives (Caspersen 2013). Efforts to bring together professional learning in the academic aspects of the programme with those in the school experience involve 'a shift in the epistemology of teacher education from a situation where academic knowledge is seen as the authoritative source of knowledge about teaching to one where different aspects of expertise that exist in schools and communities are brought into teacher education and coexist on a more equal plane with academic knowledge' (Zeichner 2010, p. 95). Through utilising the complementary strengths of IBTEs and SBTEs to educate student-teachers 'new synergies are created through the interplay of knowledge from different sources' (Zeichner 2010, p.95).

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# Problematising Practicum Arrangements. Sharing Experiences from Different Traditions and Contexts

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**Abstract**
Our 2016 ATEE presentation was an active presentation where arrangements of practicum from four different countries were presented, discussed and problematised. Based on the conclusions drawn in the volume "A Practicum Turn in Teacher Education" (Mattsson, Eilertsen, & Rorrison, 2011), these arrangements would be situated within current and emerging theories related to professional experience. After the presentation delegates would be invited to present their own experiences of practicum arrangements or models, through interactive activities, then situate them within the emerging theories and concepts.

The introduction was based on the above edited volume and the concept of renewed interest in practice knowledge and frameworks for organizing practicum. A major contribution of the volume is a list of practicum 'models' that emerges and is theorised as ways of describing how practicum learning might be organised (Chapter 12). As our international collaboration has developed and our discussions have widened we remain committed to developing a deeper understanding of these practicum arrangements both within our local contexts and with a wider lens. We are aware that practicum arrangements are developed incorporating several models and consequently we are suggesting a move from a descriptive view based on 'models' to a process-oriented view based on 'arrangements'. We see this as a natural evolution, as what is actually happening in different contexts is that those responsible for professional learning are creating their own arrangements to meet the needs or constraints of their context.

The different arrangements of practicum were presented by members of the International Network of Practicum Research and Development, representing four countries. An arrangement that combines theory and practice in a curriculum was presented (Paul Hennissen, Netherlands), followed by emergent partnerships and technology (Philip Bonanno, Malta), then Doreen Rorrison (Australia) provided an overview of a range of different programs and finally mentoring dialogues within practicum (Sirkku Männikkö Barbutiu, Sweden) were discussed.

Participants were asked to respond to the emerging concept of 'evolved' practicum arrangements by presenting their own stories of practicum situating them within the key elements of the conceptual models. Unfortunately the next step of aligning their tentative 'models' with one of the presented models and theorising the 'arrangements' within the new concept of evolving models was cancelled due to the scheduling change that allowed only one hour.

Our brief was to provide a presentation that was empowering for teacher educators who were interested in sharing and problematising their practices related to practicum. By sharing what works and what kind of arrangements there are in practicum learning, it was hoped participants would develop their understandings of their own emergent arrangement. Through guiding delegates to an evolving view of practicum, it was hoped that they would be in a position to build new theories to share and critique and take back to their workplace. Although the range of countries represented (20 delegates from 12 countries) added to the richness of the discussion it also limited the impact where quite different arrangements were described with traditions and language so disparate that sharing and problematising was difficult.
**Keywords:** practicum, preservice, models, arrangements, evolve, context

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**Introduction**

The four presentations from four different countries follows. As you will see from the table, each of the four examples of arrangements is based on several models.

| | Netherlands Sittard Combining theory & Practice in a curriculum | Malta Emergent Partnerships & Technology | Australia Over 40 institutions and over 400 courses! | Sweden …Mentoring dialogues as an integrating aspect of practicum |
|---|---|---|---|---|
| 1 Master-Apprentice model. | | Evident between students and course subject methodologists, University-based teacher educators and mentor-teachers. | Still very common especially now with many courses on line | |
| 2 Laboratory model | | Evident in methodology areas where practicum-related 'micro-teaching' sessions are delivered by excellent professional teachers | Teaching schools have been popular but exhausting for teachers- claims of burn-out | |
| 3 Partnership model | Trained Mentor teachers facilitate learning experiences in classroom | Association and collaboration with different stakeholders including formal Institutional partnership between UoM and different schools; interdisciplinary partnership of teacher educators at the FoE; partnership with Faculty students, within subjects of specialisation and with subject experts from within and outside University; Student peer partnerships; partnership with Mentor teachers and with technical staff at IT services. | Supported by AITSL the recently constituted Institute-reduces the control of the universities | Practicum placements require a close collaboration between teacher education and schools. |
| 4 Community development model | | | Has been successful employed in challenging schools and supported by scholarships aimed at preparing teachers for particular groups (e.g. refugees, indigenous, remote schools) | Focus includes community of practice |
| 5 Integrated model | Integrated curriculum to combine T&P | | Popular to a greater and lesser extent depending on staff involved | Integrated curriculum to combine T&P |
| 6 Case based model. | First two years to combine T&P | Discussion of authentic situations during tutoring sessions with university-based | Narratives and case studies are important tools and strategies for | |

| | | | | |
|---|---|---|---|---|
| | | teacher educator, methodology work groups in subject of specialisation, and discussions with the teacher mentors. | preparing preservice teachers | |
| 7 Platform model | | | Previously important but with recently mandated 80 days in classrooms not feasible. | |
| 8 Community of Practice model | | Students develop their identity in academic, school-based, area of specialisation and on-line communities. | Philosophy of socialising preservice teachers into a community of practice critical to most arrangements | |
| 9 Research and Development model | Last two years to combine T&P | The innovations in the Faculty of Education guided by the 'Inquiring-Reflective Practitioner' model, emphasis on Partnerships and the adoption of technology-enhanced approaches necessitates a research-based approach involving a partnership between University, Education Directorates, Schools and the local communities. | Still popular but restricted through the mandated 80 days of classroom teaching. | |

*Table 1: Arrangements in four countries*

**Netherlands: Combining Theory and Practice in a Curriculum**

Within the teacher-training institute of primary education in Sittard in the south of the Netherlands, the main part of the curriculum is based on a combination of four models.

***Partnership-model: Practicum as the Possibility to Learn in Practice***

Within the four-year initial teacher-training program a new curriculum was developed. Within the partnership several agreements were realised. Right from the beginning until the end of their four-year course each preservice teacher spends Thursday in a school and the other days at the university. At every school there are trained mentor teachers to supervise the preservice teachers within the classroom and trained school-based teacher educators to ensure a good educational environment within the school context.

***Integrated-model: Practicum as an Integrated Element to Combine Theory and Practice***

Every year the program consists of four periods of ten weeks, with an alternation between activities located at the university and at primary schools. Every period consists of three 'ABC-weeks' using a five-step procedure (Korthagen, 2001). During the A-week at the university, preservice teachers prepare from different subject angles (Dutch, Arithmetic, Geography, Physical education and Pedagogy) for their experience in the school, and combine this with theory appropriate to their preliminary knowledge. To help the preservice teachers to focus, teacher educators of each of the five subject angles have formulated several suggestions or assignments, which can be worked out during practicum. The B-week is spent at the school during which preservice teacher 'Experience' specific

aspects of practice, like visible differences between children and differences in talent to do certain tasks. They realise that the mentor teacher is using several instruments (like tests) to measure difficulties, analyse data, using a plan for the whole group of children, giving each child a specific place within the classroom, etc. Finally, during the C-week, back at the institute, their experiences are deepened so their practical experiences can be developed and combined with theoretical knowledge. In order to offer preservice teachers more background, the teacher educator now adds Theories from the literature. The C-week is followed by a new A-week. At the end of each period after three 'ABC-weeks' there is one week for assessments.

***Case Based Model in the First Two Years***

Especially during the first two years, each A-week is started with an authentic case in order to learn to identify distinctive aspects of practicum. This case ends in the A-week with specific questions, which can be observed and discussed during the B-week at the school. Finally, during the C-week the answers will be shared and deepened with theory. Pre-service teachers learn how to analyse and interpret practicum cases in the light of research, theory and experience.

***The Research and Development Model in the Last Two Years***

Especially during the last two years (third and fourth), preservice teachers are part of a research group. The purpose of these groups within each school is to improve school development. The school chooses the topic of this research. It is necessary that there is a sense of urgency in the chosen topic. Within the research plan there is a combination of theory and practice. The group is searching for theory relevant to their specific problem, which can be used to develop practice. Finally the outcome of the research will be discussed with the whole team and elements are used to do it better next time.

**Malta The Emergent Connectivist Model for the Practicum**

The Faculty of Education, University of Malta, is currently passing through a period of intensive renovation both academically and administratively. Intensive and extensive discussions, reflection and consultations were carried out to update the underlying epistemology, vision and strategy, to review the organisational structure, the curriculum, the Practicum, the role of digital technologies in the professional development of teachers and teacher educators, and to determine the role of teacher educators in this evolving scenario. Key collective decisions are being taken about the adoption of the Learning School / School as a learning organisation. As a guiding educational philosophy, the 'inquiring-reflective knowledge worker' framework to organise the Initial Teacher Education experience and to structure the Practicum, has been adopted. The other initiatives include the upgrading of the initial teacher education programme to a Masters level, the restructuring of the Faculty into a new set of departments, the restructuring of the curriculum to promote knowledge society competences together with subject content and methodology and the restructuring of the Practicum within professional partnerships. An ePortfolio framework based on a Connectivist methodology has been adopted to address and organise these various proposals.

An emergent model for Practicum has been adopted, considering a number of key principles to create the necessary conditions for practicum learning. These principles are directly in line with the central themes of practicum models proposed by literature such as the book edited by 'A Practicum Turn in Teacher Education' (Mattsson, Eilertsen & Rorrison, 2011). The introduction of so many innovations (ie 'The Learning School' educational philosophy and the related 'Inquiring-Reflective Knowledge Worker' teacher model, Partnerships and technology-enhanced approaches) necessitates the adoption of a research-based approach involving research and development partnership between the University, Education Directorates, schools and the local communities. This is a 'Research and Development model' in the above-mentioned book. The drive to make research and development the main focus necessitated its upgrading to masters level (The Masters in Teaching and Learning).

A 'School as Learning Organisation' is being currently recommended (Kools and Stoll, 2016) as the organising philosophy and as such demands an inquiring, reflective and research-based approach so that novice and practicing teachers translate this theoretical concept into workable pedagogical strategies. The concept of a school as a learning organisation for many school systems will require "rethinking teacher and school leader professionalism in ways that allow them to become high-quality knowledge workers and changing organisational structures and processes in order to create the type of adaptive school organisation that can thrive in a continuously changing external environment" (p. 15). This is done by developing "the capacity to continuously learn, adapt and change" (p. 16). So basically the practicum has to be approached by university students having a 'learner-researcher' frame-of-mind. This is epitomised in the 'Inquiring-Reflective knowledge worker' teacher metaphor showing that university students have to adopt research tools to understand conceptual and profession-related innovations. The 'Teacher as Knowledge worker' identity implies a paradigm shift from 'teacher as instructor' (imparting of information) to one where the teacher organises knowledge acquisition (synthesis of information), knowledge elaboration, knowledge creation and knowledge sharing (UNESCO ICT-CFT; Hines, 2012). Knowledge workers in a knowledge society shift their pedagogical focus from developing competences for dealing with subject-content to ones that promote knowledge society competences (autonomous learning, digital competence, critical thinking, creativity & innovation, communication, collaboration, networking and multi-disciplinarity).

A Partnership arrangement has been developed to include association and collaboration with different stakeholders along different dimensions. Teacher Educators at the Faculty of Education are encouraged to adopt an interdisciplinary partnership, sharing and building on each other's expertise. But, moving beyond the 'apprenticeship model', teacher educators should also adopt a partnership approach with students considering them as co-designers and co-contributors to the course and the practicum. Partnership within the subject of specialisation should include subject-related teacher educators, university students and subject experts from within the university and those practicing in their fields beyond university. The Practicum should be organised within a formal institutional partnership between the University and a good representative sample of different schools, teachers and classroom contexts. This is in line with the 'Integrated model' for practicum learning where mentor-teachers and possibly school-based teacher educators guide university students in the daily tasks and interactions within the class and school, while university-based teacher educators focus more on tutoring and assessment-related aspects. Students on practicum also work within peer partnerships, organising themselves in discipline-related collaborating groups and in interdisciplinary work groups.

Partnership between faculty and practicing teachers is being formalised through a mentoring scheme that is being developed in consultation with all stakeholders. Learning during the practicum will definitely be the outcome of interaction between university students, mentor teachers and university-based teacher educators within the class and school context. Since all content and practicum interactions will be structured, managed and recorded through an ePortfolio system, this technology-enhanced approach demands further partnerships between academic, professional and technological stakeholders. Teacher educators, students, mentor teachers, Faculty and University administration have to collaborate closely with personnel from the Information Technology Services department to ensure the smooth running of the ePortfolio system.

The infusion of all aspects of life with technology, not least teaching and learning, and students' proficiency with digital technologies, compels us to analyse and subsequently organise the practicum in initial teachers education considering a connectivist, networked learning perspective. Also, considering the change in the epistemological, pedagogical and communications scenarios, the theoretical backdrop that supported education has changed so much that we need to reconceptualise the practicum from a more transformative perspective. The theories that up to now have driven education – behaviourism, cognitivism, constructivism, contructionism and situated-learning – are

becoming increasingly inapt to conceptualise and promote technology-transformed initiatives in professional development. Connectivism proposes a theoretical and epistemological framework based on leading emerging fields of knowledge like cognitive neuroscience, network theory, complex systems and related disciplines.

According to Siemens (2005) learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning is defined as actionable knowledge and this resides outside of ourselves (within an organization or a database such as the ePortfolio system). It is focused on connecting specialized information sets, and the connections that enable us to learn more are more important than our current state of knowing. Within a connectivist context, Downes (2012) identifies three interrelated dimensions: Knowledge informs learning; what we learn informs community; and the community in turn creates knowledge. The reverse also constitutes learning; knowledge builds community, while community defines what is learned, and what is learned becomes knowledge. The three are aspects of what is essentially the same phenomenon, representations of communications and structures that are created by individuals interacting and exchanging experiences.

This Connectivist epistemology and the paradigm shift demanded by the knowledge society, changes the school from a teaching to a learning institution and necessitates a change in teachers' role from learning organisers to knowledge workers, especially as modellers of learning. Consequently the role of future teacher educators will be to model the teaching-learning process to prospective and practicing teachers. Teachers need to understand and eventually accept that in today's reality, where the walls of the classroom have become transparent and where everything is accessible, questionable and debatable, they have to become more accountable, accept responsibility and provide explanation for their choices and actions. Therefore, they are required to develop the competencies in planning, managing, recording and evaluating their own professional development and practice using relevant digital tools to organise and manage these competences. This implies the need to develop competences in managing their own learning, together with assessment-related competences involving both 'Assessment OF Learning', 'Assessment FOR Learning', and 'Assessment AS Learning'.

The ePortfolio framework provides the optimal pedagogical context and tool to promote and organise the professional development and professional practice of student teachers during the practicum. The ePortfolio will serve students to organise, manage and record their professional development along two dimensions: (a) the methodology in the teaching-learning component of their area of specialisation; (b) the organisation of the practicum experience involving all interactions within the proposed school partnerships model with mentor teachers, school based teacher educators and university-based teacher educators.

The dynamic emergent model for learning during the practicum draws on various central themes from the models proposed by Mattsson et al (2011). The Master-Apprentice dimension will be evident when students interact with course subject methodologists, University-based teacher educators and mentor-teachers. These will serve as inspiration, a source of knowledge and model for competence development to novice, preservice teachers. Aspects of the Laboratory model are evident in methodology areas where practicum-related 'micro-teaching' sessions are delivered by expert professional teachers. The tutoring sessions with the university-based teacher educator, the methodology adopted in the subject-based work groups and most of the discussion with the teacher mentor will definitely be Case-based oriented. Authentic cases and situations that arise in class or other educational contexts are analysed and interpreted in the light of research, theory and experience. Meanwhile, adopting a connectivist perspective to the practicum enables preservice teachers to consider the proposed practicum models, partnerships and the ePortfolio as vehicles of knowledge residing in these systems that can be used, elaborated and manipulated. Personal

knowledge is just a node in the extensive network of knowledge. Learning during the practicum is a process of creating connections with relevant nodes of knowledge and knowledgeable persons.

**Australia: A Range of Models and Challenges**

Current research in Australia suggests that the arrangements or settlements agreed upon for practicum are dependent on the context or the setting. Local and university policies are differ between regions and states despite the recent "Australian Institute for Teaching and School Leadership" (2009). This nationalisation was the outcome of the reforms agreed to in the National Partnership on Improving Teacher Quality (2009) and the goals and commitments set out in the Melbourne Declaration on Educational Goals for Young Australians (2008). All schools and university departments of education must comply with the seven National Professional Australian Standards for Teachers. These are divided into three areas; Professional Knowledge, Professional Practice and Professional Engagement and these are in turn arranged into four career stages from Graduate Teacher to Lead Teacher. There are thirty-seven descriptors for each stage and these are naturally focussed on and interpreted in a range of ways depending again on context.

The skills, personalities and dispositions of the employed staff in universities and schools play a major, yet variable role in the learning of preservice teachers. Teaching and learning are both enabled and constrained due to the effects of transience, leadership styles, the school culture, its ethnic and gender mix as well as the political background and socio-economics of the setting. How the curriculum is interpreted and the local expenditure on resources and technologies also plays a major role. The influence of national testing and international ratings, and other tensions around assessment, have been recently an important contributor to staff moral.

Australian universities have always been proud of their autonomy and free speech but this control has also been eroded. Questions around who are the gatekeepers, what counts as evidence and what is equitable and just, are fortunately beginning to emerge to challenge nearly a decade of neo-liberal control and attempts to mandate all aspects of teaching and learning.

In terms of the practicum (or Professional Experience as we have been instructed to name it), the decisions were taken from those with the experience, research knowledge and authentic connections to teacher education, by the policy makers and controlled through marketplace policies of efficiency, proof and evidence. By simplifying all aspects of initial teacher education it became easier to control by those with limited understanding of the complexities involved in teaching teaching and learning teaching. Fortunately the leaders in the field are now (re) finding their voice and are beginning to fight back through challenges to the authenticity of treating human beings as commodities and educational research knowledge as non-rigorous/non-evidence based. It is possible that, through the control and rating of research and publications, an entire generation of early career researchers in teacher education have not been heard. Also, partly as a result to the cut-backs in funding, an entire generation of new teachers are now learning through on-line and e-learning courses, with little or no research evidence that this is a viable and authentic alternative.

As a response to the need to hear the stories of innovation and success in practicum programs a group of teacher educators representing 16 Australian Universities met to share their local, contextual responses to practicum/professional experience. Through submitting the 'story' of their initiatives/innovations to the organising committee, 30 participants were chosen and grouped for discussion through four themes that emerged from their narratives. Supported by two key-note speakers selected to provide a national and international context and some direction from the organising committee, these groups immediately connected through their shared experiences and conceptual frameworks. Their collaboration and forthcoming (Springer, 2017) publication provides significant evidence of how lived experiences are stronger than mandated directives.

An outcome of the massive increase of on-line and e-learning (120% increase in 10 years, 80% of Australian universities now offering totally external and mixed-mode teaching qualifications) is that the management of practicum placements has moved from the university to individual preservice teacher requests to individual schools. This has changed the dynamic considerably. One preservice teacher reported that she tried over 120 schools before she found a placement. Others found they needed to focus on non-mainstream or private schools. Clearly a result of this is very much a return to the 'master/apprenticeship' model of mentoring. This observation is not meant to be judgemental but is a reaction to the lack of alternatives enforced by the context- the likes of the partnership model, the platform model or the integrated model, all held in high esteem during the last decade, are just not possible when 150 preservice teachers are in 150 different schools over 8 states and territories of Australia (with a smattering of others as far afield as the UK, Russia and China). The local demands are also challenging- in some states and territories police clearances/working with children cards include full day courses and further assessment. The role of the classroom mentor now becomes even more critical and moderation of practicum assessment extremely challenging. Furthermore, in a user pays system like ours, there is more than questions of equity and justice at stake! Certainly further research is necessary.

**Sweden – Stockholm: Integration through Dialogue**

The role of practicum in teacher education has changed dramatically over the recent decades in Sweden. After a massive critique, the totally separate practicum was integrated into all the courses in teacher education programs in 2001. This integration of theory and practice led to substantial organisational and logistic difficulties and was abandoned in favour of a curriculum where practicum constitutes a separate course (Figure 1).

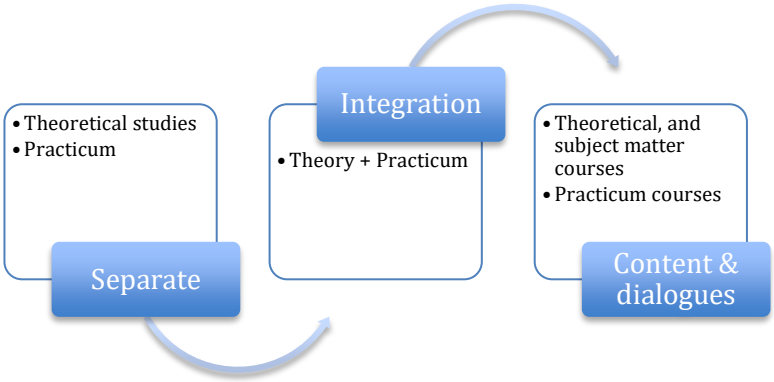


*Figure 1. Practicum in Swedish teacher education*

The latest reform (in 2011) intends to change the position of practicum from a fragmented part included in all the courses within a teacher education program into a separate but unified entity with its own specifically defined goals. Practicum architecture (Kemmis & Grootenboer, 2008) includes new features that are considered as supportive and developmental to the practicum experience of preservice teachers, such as the introduction of mentoring dialogues. These dialogues include preservice teacher, mentoring teacher at the practicum school and the teacher educator. Mentoring dialogues have an assessment purpose but they should also be developmental in nature and give preservice teacher guidance during the practicum (Jönsson & Mattsson, 2011).

In the process of reorganising practicum within teacher education, the role of mentoring dialogues is gaining a new kind of actuality and importance as a tool for supporting preservice teachers in their development from a novice to a professional teacher. They are being recognized as a collaboration tool in the 'integrated model' where teacher education institutions and municipalities/schools jointly share the responsibility for training preservice teachers in the practicum. In a teacher education model

where practicum placements are dispersed within the whole education program, mentoring dialogues have been developed as an instrument for follow-up, assessment and guidance. They have developed over the years towards an increasingly formalised and structured event where preservice teacher and the teacher educators come together for a discussion on the professional development
.
Mentoring dialogue takes place after each practicum placement and the overall aim is to give the preservice teacher an opportunity to reflect upon and self-assess their professional development during the given period. The reflection and assessment is done in relation to the expected learning outcomes for the practicum and to the specific matrix for professional development that has been created as a support.

In our earlier research (Männikkö Barbutiu, 2015), we have analysed mentoring dialogues as communicative action. We found that even if the preservice teacher should "own" the dialogue according to the guidelines of the teacher education program, the leading person in the dialogue usually is the supervisor. The preservice teacher and the mentoring teacher play only a minor part in the conversation. We also noted that these dialogues seldom engage in deeper conversations over the professional issues and could thus be described as affirmative and confirming rather than mentoring and counselling, the focus being on a summative assessment of the practicum period.

To further support and improve mentoring dialogues, more detailed and structured instructions have been developed. Here a program for preschool teachers is used as an example to illustrate how the content and progression are outlined. These instructions define the competences and skills that a fully professional teacher should gain during the teacher education program and they also convey the perception of how progression should take place. Four levels of progression have been defined: 1) novice; 2) advanced beginner, 3) competent teacher, and 4) professional teacher (see Figure 2).

| Level 1 | Level 2 | Level 3 | Level 4 |
|---|---|---|---|
| Novice teacher<br>Focus on own performance | Advanced beginner<br>Focus on situation | Competent teacher<br>Focus on the learning of children | Professional teacher<br>Focus on the big picture |

*Figure 2. Levels of professional development*

These four levels have shifting foci: at the novice level, the focus is on the preservice teacher's own role and conduct with the aim of acquiring general knowledge of the teaching assignment and developing a professional approach based on inquiry and observation.
As advanced beginner, the focus is moved to the teaching and learning situation meaning that the preservice teacher acquires knowledge of the teaching assignment and develops his/her own practice through active observation, analysis, examination and reconsideration. Reaching level three and becoming a competent teacher means that the focus is now on the children and their learning. Preservice teachers are required to develop their ability to formulate the teaching assignment and to translate their teaching knowledge into action. They should also develop an ability to critically examine their own action and draw relevant conclusions. On level four, the focus is shifted to view education from a holistic perspective. Preservice teachers are now required to develop their ability to problematise and interpret their teaching assignment, find new perspectives for their teaching and the educational activities, and also develop goal oriented, long term strategies. They should also learn to understand their place and role as a part of the educational organization as a whole, and be able to participate in the development of the organisation and its activities.

In the design of the mentoring dialogue, three areas of focus have been identified as important and central for the monitoring of the progression of the preservice teachers from a novice teacher toward a professional teacher: (1) progression towards an analytical and reflective competence based on scientific evidence and proven experience; (2) progression towards a didactic competence, and (3) progression towards communicative and democratic leadership. These three areas of competences give an overall focus and structure to the dialogue, and help to link the dialogues to the other parts of the teacher education programs.

The introduction of mentoring dialogues can be seen as a feature in the development of a partnership model as well as a community of practice model where the preservice teachers are supported in their professional development and introduced into the community of practice by the teacher educators and mentoring school teachers in a collaborative effort, as teacher education institutions and schools increasingly seek partnerships for securing education of teachers.

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# RDC N/A

# Entrepreneurship as a Competence: In Search of a Definition for ATEE

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**Abstract**
The purpose of this paper is to present the state of the art on the elements that mould entrepreneurship, from a review of updated literature. Based on this reviewed, it is also intended to propose a research involving members of the ATEE, to establish a definition of the competence 'entrepreneurship' and its constituent elements, as well as its proficiency levels for primary and secondary education. The results of this research will be used to promote the training of teachers for entrepreneurship teaching in the different educational levels. The concept of entrepreneurship has been widely presented in the literature, both inside and outside the school environment. In some cases, defined as a generic construct; in others, as a generic competence or linked to employability; finally in other cases, as an element of other skills. You will often see references to innovation, creativity, autonomy, initiative, achievement orientation or leadership, as elements linked to entrepreneurship. Thus, different concepts are specifically defined, in the literature, as competences or as elements of competences or other skills. For example, in some cases, personal initiative is presented as a competence within entrepreneurship, while others consider entrepreneurship a competence, which includes inter alia the personal initiative. There seems to be no objective arguments so that a way to organize the various elements around entrepreneurship would be better than another. However, we understand that it would be suitable for ATEE, and a work priority of RDC ENTENP-ED (Enabling Teacher For Entrepreneurship Education) to standardize the concept of entrepreneurship as a competence, define its competence elements, indicators of achievement and proficiency levels for primary and secondary education. To carry out this project, we will use a qualitative methodology. From the elements of competence defined, we will select a sample of professionals of education who are members of the ATEE, to apply different Delphi rounds to the 'library of competences 'developed. Using this technique, we will select the most relevant elements of competence. Also we will establish the most appropriate assessment indicators and levels of achievement for the different educational stages. As the main result of this project it is expected to provide the ATEE of a document that standardizes the concept of 'entrepreneurship' in Europe, conceived as a competence, which can serve as a reference for teaching at different levels of the educational system (primary and secondary education).

**Keywords:** Basic education (primary & secondary), competences-based teaching, entrepreneurship

## Introduction

The necessity of increasing the probabilities of academic and professional success is linked to the acquisition of two types of competencies: generic or basic competencies and employability competencies. The acquisition of suitable levels of proficiency of these skills should start in early stages of education (Primary and secondary education). To achieve this objective, it is necessary to count with frameworks that teachers can take as a reference, as well as materials to use in the classroom, which are developed by educational experts and teachers in service. Currently there are many international proposals (both within and outside the EU), about which basic and employability competencies are most important, and how their constituent elements articulate. However, these proposals have generally not been prepared from the perspective of teacher trainers. For this reason, we think it is important for the ATEE to develop a specific proposal, which places entrepreneurship as a core competency for the comprehensive training of individuals, and equips them with tools for social integration and employability in the global knowledge society. This proposal should include two key aspects: (a) a definition of entrepreneurship as a competence, that contains its comprising elements, its levels of achievement, and its indicators and assessment tools for primary and secondary levels; (b)

a collection of materials for teaching entrepreneurship in all areas of the primary and secondary curriculum, which can also be used for initial teacher training in teaching entrepreneurship.

In this paper we address the structure of a research project that develops the first described key aspect, i.e. the definition of entrepreneurship; for this task we will involve RDC ENTENP members, but also ATEE experts members in competencies training and initial teacher training.

**Research question**

The research problem to be considered is to define entrepreneurship as a core competency for improving the overall education of children and youth in terms of basic and employability competencies that will enable the future increase of their chances of academic and work success. This definition includes elements that comprise the entrepreneurship competence; its proficiency levels for each school level (primary and secondary), the evaluation indicators that determine their achievements, and the corresponding instruments to measure them.

The problem is addressed in this paper and conforms the first phase of a larger project. The project also aims -in a second stage, to elaborate the materials for teaching entrepreneurship in all areas of the curriculum of primary and secondary education, which also may be used for initial teacher training in teaching entrepreneurship. This second phase is not described in this paper.

The entrepreneurship competence definition, its elements, levels of achievement, assessment criteria, and instruments will be effective only if the proposal is prepared from the perspective of those who train teachers. More precisely, we plan to involve members of the ATEE, and specifically of the RDC ENTENP (Enabling Teachers for Entrepreneurship Education), as experts for the project execution. This process will enable further training activities in the faculties of education, in order to train teachers in teaching entrepreneurship.

**Theoretical Framework**

The research problem to be considered is to define entrepreneurship as a core competency for improving the overall education of children and youth in terms of basic and employability competencies that will enable the future increase of their chances of academic and work success. This definition includes elements that comprise the entrepreneurship competence; its proficiency levels for each school level (primary and secondary), the evaluation indicators that determine their achievements, and the corresponding instruments to measure them.

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Theoretical framework

Different authors have defined entrepreneurship as a construct, a set of behaviors, lifestyles, cultures, forms or competencies. In this sense, international literature has assigned diverse categories to the

concept, either as an element of another competence, or a competence in itself. In the latter case, it has been considered as a generic (basic, cross) competence, or a competence linked to employability.

For example, Lowden et al. (2011) have conducted qualitative research (interviews and employer case studies, etc.) as well as an extensive literature review of competencies for employability, among which they include Entrepreneurship, Teamwork, Problem Solving, Self Management, Initiative or Leadership.

The Tuning Project (González and Wagenaar 2003) is one of the most important resources for the creation of the European Space of Higher Education, gathering more than 100 international experts. This project is an international referent with greater projection in identifying competencies. The generic competencies (instrumental, interpersonal and systemic), selected by the project include initiative and entrepreneurial spirit along with other skills such as Problem Solving, Decision Making, Teamwork, Interpersonal Skills, Creativity and Leadership.

Tobon (2010) has developed a complete competency-based training model, which is now widespread in Latin America and parts of Europe. Tobon distinguishes among basic, generic and specific competencies. From this group, the second one (generic) is linked with employability. Some examples are: Entrepreneurship, Resource Management, Teamwork, Information Management, Systemic Understanding, Problem Resolution, and Work Planning.

Other international studies have not considered directly entrepreneurship as a competence but they have defined life skills in the knowledge society closely related to the concept of entrepreneurship. Binkley et al. (2012) through the ATC21S (Assessment & Teaching Skills of 21th Century) initiative, has proposed competencies such as Creativity and innovation, Problem Solving and Decision-Making, Collaboration and Teamwork or Personal and Social Responsibility.

The report of the Confederation of British Industry (CBI 2009) proposed the idea of a national body of recognized competencies in the UK, as part of a qualifications framework that comprises different educational levels, and defined some of them as Self-Management, Teamwork and Problem Solving

Robinson (2000), has established a categorization of competencies that enhance employability by distinguishing between basic academic competencies, competencies of higher cognitive level, and personal qualities, including Creative Thinking, Decision Making, Problem Solving, Responsibility, Self-Confidence, Self-Control or Team Spirit.

The Education and Training 2020 Working Groups (ET 2020 WGs38) has started recently the task of defining the European Competence Framework (CRF) for entrepreneurship (Bacigalupo, Kampylis and Punie 2015). In this event the ET 2020 WGs38 discussed the possible constituent parts of this competence and emphasized the place of self-efficacy and self-confidence as a part of this concept.

The evidence reviewed in the OvEnt study confirmed the elements proposed by ET 2020 WGs38 for entrepreneurship competence, but also mentioned the following attitudes as important elements: communication, leadership, decision making, innovation, responsibility, collaboration, ideas generation, problem-solving, work independently or autonomy, negotiation and networking.

Therefore, there is enough theoretical support to address a definition of the entrepreneurship competence and its elements, representative of the ATEE, developed from the perspective of teacher educators, establishing its elements, proficiency levels, and criteria and assessment tools for primary and secondary education.

**Research methods**

For the first part of this project (definition of the *entrepreneurship* competence and its elements, establishment of levels of achievement as well as indicators and assessment tools), the use of a *Method of Consensus* is proposed, where the ENTENP RDC members reach agreements on the basis of literature review, in order to make a coherent proposal of the *entrepreneurship* competence and its elements, that includes proficiency levels and indicators and assessment tools (Lanoy and Procaccia 2001; Barroso and Llorente 2013).

For the second part of this project (validation of entrepreneurship competence and its elements, levels of achievement, and indicators and assessment tools), we propose the employment of a validation method through expert judgment; the advantages of this method have been evidenced in the literature (quality of the responses, level of depth in the assessment, capability to determine the level of knowledge about contents and new little studied topics, and possibility of obtaining detailed information on the subject under study) (Lanoy and Procaccia 2001; Barroso and Llorente 2013).

To make effective the advantages of the model of validation by expert judgment, it is necessary to count with different types of experts, so we define various fields from which they will be selected: (a) Schools scope; (b) Training in competencies research scope; (c) Teacher training scope

There is no agreement on the ideal number of expert judges, but based on proposals such as the one from García and Fernández (2008), we will have a total of 18 expert judges from different fields. The selection of expert judges will be made by a criteria system: (a) The expert judges in the field of educational centers will be: 3 teachers or principals of primary education and 3 teachers or principals of secondary education; they would have to be members of the ATEE (selected from among those who express their desire to participate in our project); (b) The expert judges in the field of research on competencies will be: 6 PhD experts in research on competencies, ATEE members selected from among those who express their desire to participate in our project); (c) The expert judges in the field of teacher training, will be experts in this area, members of the ATEE (selected from those proposed by the Direction Committee of the ATEE).

The selection criteria for the experts corresponding to fields a and b, will be the following: (1) Not having directly participated in the processes of definition of the entrepreneurship competence, achievement levels and criteria and evaluation tools; (2) Have the highest scores in the Coefficient of expert competence or Coefficient K, (García and Fernández 2008; López 2008; Mengual 2011), which will be calculated for every candidate. The selection criteria for experts in the field c will be: not having directly participated in the process of defining the entrepreneurship competence, their levels of achievement and the criteria and tools for evaluation.
We propose the strategy of *Individual Aggregation of Experts*, obtaining the required information from each expert individually, thus avoiding unplanned interaction.

Cabero and Llorente (2013) establish in general 4 stages for the expert judgment validation: Establishment of the selection process; expert selection; Selection of the phenomenon or object to evaluate; drawing conclusions. They also describe both quantitative data taking instruments (questionnaires, evaluation matrix, checklist, concrete aspects assessment lists) and qualitative instruments (in depth interviews, discussion groups).

On the basis of the above-described aspects, we present now the sequence of activities for the validation and the instruments that will be used in an integrated manner.

(a) Development of the proposal of entrepreneurship competence and its elements, proficiency levels and assessment criteria and instruments, performed by the DRC ENTENP. Focus groups will be employed as basic instruments to elaborate the proposal and validate the individual work of the

members of the RDC, developed from the review and analysis of recent international literature in the field of entrepreneurship, competence-based training and systematization of existing core competencies and employability.

(b) Validation of the proposal.

(b.1) ATTE experts will be selected according to the criteria and characteristics listed above.
(b.2) A template assessment of the proposal prepared by the RDC is created.
(b.3) The evaluation template will be sent to various experts.
(b.4) Once having obtained the templates completed by experts, the Cohen kappa coefficient will be applied for categorical variables concordance, from which a validation report will result containing the recommendations for modifying or refining the proposal.
(b.5) Reviewing the entrepreneurship competence proposal, including its elements, proficiency levels, and criteria and tools for evaluation by ENTEP, on the basis of the validation report.

**Expected outcomes**
From the two phases in which this project is based, the following series of outcomes are expected:

In the first phase of this paper, we expect to develop: (a) A definition of entrepreneurship competence as ATEE's own, elaborated from the perspective of teacher educators and teachers; (b) Detailed description of the elements composing the competence; (c) Detailed proficiency levels of each of the elements of the competence (basic, advanced, excellent), by the end of the primary and secondary stages; (d) Evaluation criteria for each of the elements and levels of achievement; (e) Assessment Tool (heading) for each of the elements and levels of achievement.

In the second phase of the project that we have addressed in this paper, we expect to develop materials for teaching entrepreneurship, which can be used by teachers in each of the areas of the curriculum of primary and secondary education. These materials must be contextualized for different European countries and different languages. These materials will also be used for initial teacher training in the faculties of education.

**Conclusion**
Competency-based training provides a complete framework to promote the teaching of entrepreneurship (understood as competence), which requires initial teacher training for teaching entrepreneurship, including the definition of the elements of competence from the point of view of teacher educators.

Based on the recent literature on teaching entrepreneurship and particularly the full reports on entrepreneurship as competence (Bacigalupo, Kampylis and Punie 2015), teacher training for teaching (European Commission 2011) or the development of the teaching of entrepreneurship in the curriculum (EACEA 2012), the RCD ENTENP has decided to assume the challenge of systematizing within the ATEE the concept of entrepreneurship as competence, define its elements and develop supporting materials for teaching in all curriculum areas of primary and secondary school.

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