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Preface

The book *"Innovations, technologies and research in education, 2019"* includes research papers presented at the ATEE Spring Conference 2019 (http://ateespringconference.lu.lv) on emerging trends in technology-enhanced learning, on innovative educational ideas, and on how to facilitate learning motivation, transformative learning, integrative learning, constructivism and constructionism, novel approaches, and innovative educational solutions. The ATEE Spring Conference has been organized by the Association of Teacher Education in Europe and the University of Latvia biannually since 1997.

At the beginning, it brought together educational researchers from just the Baltic countries, but nowadays the conference brings together researchers from all around the world to share their ideas, present their research outcomes, and discuss future research directions.

In the present book, there are 52 chapters that are devoted to studies on the didactic aspects of technology usage; some are devoted to searching for ideas about how to facilitate learning, how to ensure knowledge construction in transforming the learning space, and how to meet social aspects affecting the acquisition of education.

Educators must introduce various technological innovations to prepare students for their future, and they will have to deal with different technologies to make the learning process more interesting, keep students more engaged in the learning process, and, in order to improve motivation, facilitate self-directed learning. The conference offered the possibility for everyone to participate in the discussions on modern qualitative education, innovative ideas of smart pedagogy, the place and role of technologies in the educational process, and research challenges in order to evaluate the impact of innovations on the development of different competences. Innovative pedagogical methods, different technologies, and technological solutions have an immeasurable potential to broaden the range of methods applied in education, to promote learning, and to introduce changes in the pedagogical process. Innovations serve as a teaching assistant for sharing good practices, developing learning platforms, changing forms of cooperation, and ensuring a real-life teaching/learning process that places students at the heart of the learning experience. However, the greatest challenge is still how to help teachers personalize the teaching/learning content according to students' individual needs and interests in order to ensure the possibility for all learners to improve their potential and to provide equal opportunities for all to support

and promote their learning. How can we ensure that technological solutions serve not only as a source of help for the teacher to transform the learning principles but also facilitate pupils' and students' participation in the learning process in searching for creative solutions and in elaborating innovations? How can we verify that the change of learning forms is meaningful in the application of different innovative pedagogical methods and technologies? Which research methods should be used?

The chapters in the book serve as a basis for further discussions on the development of educational science, on topical research fields, and on practical challenges. The book will be particularly useful for scientists in the educational field who wish to get acquainted with the results of studies conducted in countries around the world on emerging issues in the educational sciences.

I am very grateful to all the authors for their efforts in the preparation of their chapters and for sharing their ideas.

I hope that the book will contribute to the field and open up new lines of research, new ideas, and new concepts in order to develop new innovative solutions to make the world a better place.

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INTEGRATING EDUCATION, TECHNOLOGY, AND SDG'S: A THREE-PRONGED COLLABORATION

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ABSTRACT

Social and technological evolutions are forcing changes in education worldwide. An important guide for such changes are the sustainable development goals (SDG's) adopted by the United Nations. SDG 17 calls for partnerships built on shared vision and goals. In this study, statistics reveal the need, in adult education, for more strategic transversal skills, such as communication, interaction, networking, global international communication, and social participation skills, rather than formal instruction. A case study is presented illustrating a real example of how a tripartite collaboration between schools, institutions, and enterprises can work to engage students around the SDGs. The project was a virtual reality exploration of the planet Mars, in which young adult students at risk of exclusion were engaged to collaborate, solve problems, and work toward gender equality. The authors correlate the case study activities to several learning taxonomies, and propose the basis of an action-oriented framework for developing a smart pedagogy of digital transformation.

Keywords: Smart pedagogy, Adult education, Sustainable development, Lifelong learning, Education technology, Artificial intelligence, Virtual reality, Serious games.

Introduction

Clearly, we are in a period of significant educational change. The social and technological evolution of this second decade of the 21st century is obliging us to re-examine our understanding of learning, and to modify our teaching processes accordingly. For the first time, we have access to a large body of analytics data that can actually give us a concrete measure of where we are succeeding, and where we need improvement. The advent of artificial intelligence (AI) as an educational tool will provide us with much faster feedback than we have ever had before, but it will also render the data we use much more complex. It will also provide the possibility

of a very fine-grained level of personalisation, in both the learning offer provided to students, and the feedback data received by educators. As an example, AI-driven facial recognition software is already being used in schools, both for security (Tate, 2019) and to monitor student engagement (Krithika & Lakshmi Priya, 2016).

The ubiquitous availability of information using Internet search engines has already begun changing the role of teachers from source of subject matter information to guide and facilitator through the complex maze of today's information-rich and technologically complex world. A valuable model to help teachers with this daunting responsibility is the set of 17 sustainable development goals (SDG's) for 2030 adopted by the United Nations (United Nations, 2015). SDG 4 focuses on quality education, but to achieve this quality, it is necessary to teach about all the other SDG's.

In May 2019 the authors had the opportunity to present this study at the Spring Conference of the Association for Teacher Education in Europe (ATEE) in Riga. The data and reflections included here are the result of the ir previous research, and call upon a case study on Catalan education (Spain). The project in the study was designed to detect educational needs among youngsters and illustrate how to respond to those needs, via a tripartite partnership between schools, institutions, and private enterprise (SDG 17) to foster the educational objectives of SDG 4 and all the other SDG's.

SDG 17: Partnerships

The text of SDG 17 includes the following:

A successful sustainable development agenda requires partnerships between governments, the private sector and civil society… The se inclusive partnerships, built upon principles and values, a shared vision, and shared goals that place people and the planet at the centre, are needed at the global, regional, national and local level (United Nations, 2015).

The shared vision and goals referred to in the text are the heart of the ensemble of SDG's. If we want to optimize education to include the m all, a tripartite partnership facilitates the task greatly. Each member of the triad carries with it a set of "natural" SDG's:
- Schools:
  - SDG 4 – Quality Education
  - SDG 5 – Gender Equality
  - SDG 10 – Reduced Inequalities
- Institutions (e.g. ministries, government agencies, NGO's):
  - SDG 3 – Good Health and Well-Being

  o SDG 11 – Sustainable Cities and Communities
  o SDG 16 – Peace, Justice, and Strong Institutions
- Private enterprise:
  o SDG 7 – Affordable and Clean Energy
  o SDG 8 – Decent Work and Economic Growth
  o SDG 9 – Industry, Innovation, and Infrastructure

Of course, responsibility is shared across the board, with the above list indicating the lead sector. The remaining SDG's can be dealt with in education through the synergy that comes from the se three sectors' collaboration.

Demand for 21ˢᵗ Century Skills

Although the re is no real consensus on which 21st century skills should be taught at school, the re is a wide agreement that those should be more than mere "school subjects." The y must be understood as real "transversal competences" for solving complex problems and living together in a hyperconnected world (OECD, 2017).

Communication, creativity and collaboration are among the most well-accepted characteristics of the future digital citizen. When comparing the skills that the World Economic Forum defended in 2016 as essential in our modern world and the skills that The Catalan College of Economists proposed for empowering the next generations of workers, we find several correlations, as shown in Table 1:

Table 1. Comparison among skills defended by The World Economic Forum and The Catalan College of Economists, as competences in demand (2016–2017). Comparison by the authors

World Economic Forum 2016	Col·legi d'Economistes de Catalunya 2017
Complex problem-solving	Creativity
Critical thinking	Complex problem-solving
Creativity	Decision-making
Human Resources management	Human Resources management
Coordination & Networking	Emotional intelligence
Emotional intelligence	Cognitive flexibility
Decision-making	Service orientation

This double list includes skills connected to high level thinking processes (such as critical thinking and decision making), emotional and social growth (emotional intelligence and networking), and strategic behaviour

(human resources management). The se are skills in demand both for lifelong learning and labour markets, and the y are part of the transversal personal and professional abilities that the new generations should have in the ir curricula. Often, this demand is not met through official adult education courses, and it can produce disaffection for lifelong learning and low demand for traditional adult education.

In Catalonia, public adult education schools offer formal, certified studies. This includes basic literacies, levels of primary and secondary studies for young adults who didn't succeed in regular schools, and courses for immigrants who did not complete studies in the ir home countries. Adult education institutions also offer studies for students to prepare the secondary education certificate, and the access exam for vocational education. The re is, however, no clear offer of transversal studies where adult learners can develop global skills, learn how to organise personal networking, or practice decision making. The authors of this article have reviewed the official data for adult education in Catalonia, and compared the specific demand for instructional education, cross curricular learning, and global skills for lifelong learning. Data for adult education in Catalonia is public and available on the Statistics web of the Department of Education, for courses from 1998 to 2018 (Departament d'Educació, 2019).
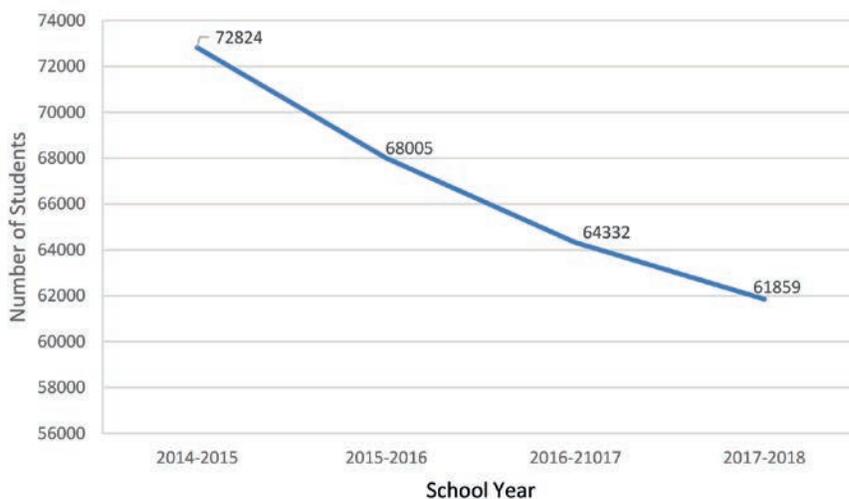
Figure 1. Students in adult education, in Catalonia. Source: Departament d'Ensenyament. Subdirecció General d'Organització, Coneixement i Sistemes d'Informació. School Year 2017–2018 (publicly available data)
http://ensenyament.gencat.cat/ca/departament/estadistiques/estadistiques-ensenyament/cursos-anteriors/curs-2017-2018/formacio-persones-adultes/

The result is clear: the current general formal education offer is far from including the most demanded competences for the new labour markets. This is not limited to adult education; universities are also trying to adapt to changing needs by collaborating with private enterprises (Gallon & Lorenzo, 2014, p. 132).

In the school year 2017–2018, the overall global demand for adult education in Catalonia came from a total of 61.859 student (37% from immigrant students and 63% from local students). This represents a clear decrease from 2016–2017 (64.332 students), 2015–2016 (68.005 students) and 2014–2015 (72.824 students). Figure 1 shows a clear decline of interest in official studies for adult education in Catalonia.

Formal Offer in Adult Education (Catalonia 2017-2018)

27%

38%

35%

▦ Cross-professional Skills

▤ Cohesion and Social participation

▧ General Studies and Access to Compulsory Education
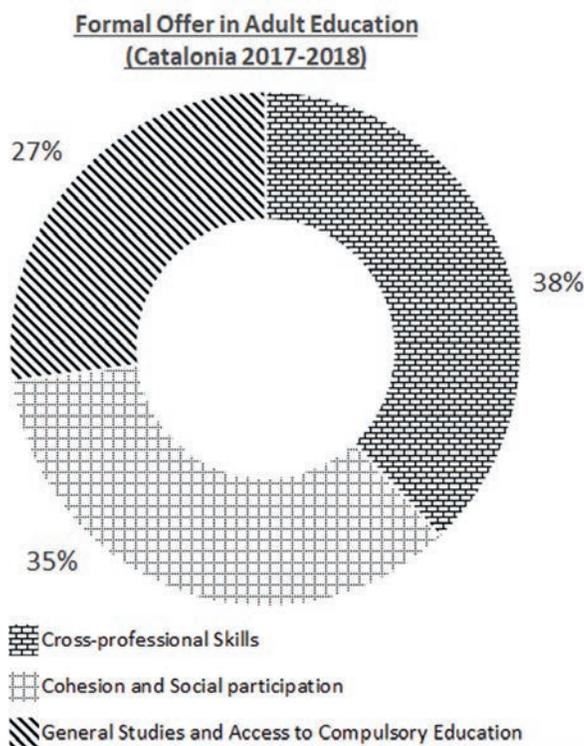
Figure 2. Demand for cross-professional and social skills by young adults in Catalonia. Source: Departament d'Ensenyament. Subdirecció General d'Organització, Coneixement i Sistemes d'Informació. School Year 2017–2018 (publicly available data)
http://ensenyament.gencat.cat/ca/departament/estadistiques/estadistiques-ensenyament/cursos-anteriors/curs-2017-2018/formacio-persones-adultes/

In 2017–2018, the demand for general studies and access to compulsory education was only 27% of the total request. This includes official training for access to different vocational education studies and levels, together with preparation for the selective exams required to access other official studies. At the same time, 65% of the total demand was for more transversal studies such as cross-professional and communicative strategies. As Figure 1 shows, 38% included foreign languages and digital competences, and 35% were studies related to cohesion and social participation skills, including local language (Catalan), instrumental language (Spanish), and instrumental learning (competences at primary education level). The se ratios show how strategic studies in communication, interaction, networking, global international communication, and social participation skills seem more attractive to young adults, and represent two thirds of the total demand (Figure 2).

Figure 3 breaks the demand down by segment. It clearly shows that the combined interest in transversal and social studies for lifelong learning far outstrips the demand for traditional instructional learning and access to university studies.
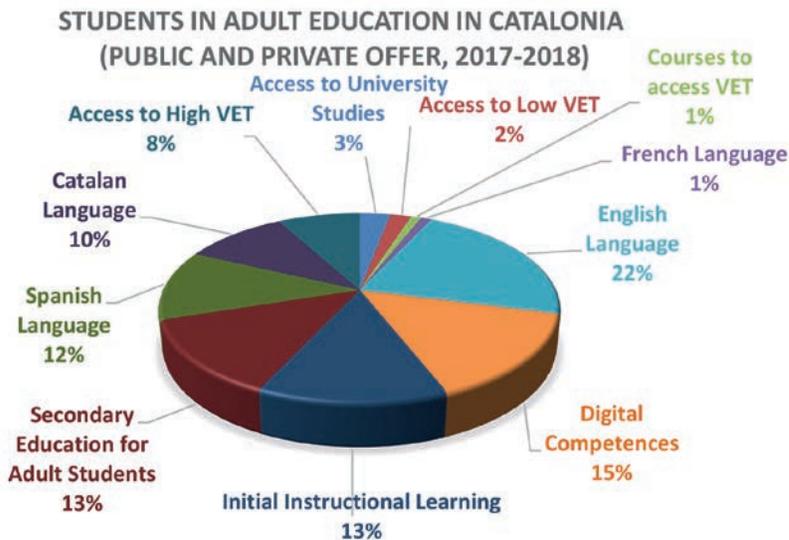
Figure 3. Demand for studies in adult education in Catalonia (segmented). Source: Departament d'Ensenyament. Subdirecció General d'Organització, Coneixement i Sistemes d'Informació. School Year 2017–2018 (publicly available data).
http://ensenyament.gencat.cat/ca/departament/estadistiques/estadistiques-ensenyament/cursos-anteriors/curs-2017-2018/formacio-persones-adultes/

In response to this demand, the Department of Education in Catalonia is exploring different strategies to present alternative content with digital methodologies. In the 2018–2019 school year, the department started a series of case studies, collaborating with government agencies and private industry, to motivate students, favour engagement, and develop lifelong learning skills. The y included workshops for vulnerable students using virtual reality (VR) and gamified activities.

These activities were organised by the educational service devoted to kids with social needs, in vulnerable situations, and at risk of marginalisation.

Case Study

Activity: Workshop based on an adventure in a 3D videogame. The mission of the participants is to recuperate a technological artefact that has fallen on the surface of the planet Mars. To accomplish this, teams must take into account the hostile atmosphere, questions of survival, management of technology, and the ir dependency on one another in this environment. The y must organise itineraries, solve problems, and take collective decisions about tasks related to basic skills and literacies (e.g. plurilingual communication, maths, map-reading, collaborative problem-solving).

Participants: Students at risk of exclusion (one group of 16–18-year-olds, at low secondary level at a state school, and one group of 18–23-year-olds, in a state penitentiary school).

Languages of research: Catalan and English.

Place: A public secondary school, and a penitentiary school in Barcelona (Catalonia, Spain),

Coordinating Institution: Subdirecció general de Tranformació Educativa, Direcció General d'Innovació, Recerca i Cultura Digital. (Catalan Department of Education).

Provider enterprises: NetLanguages (experts in foreign language teaching), Humantiks (experts in Serious Games), and International House (expert organization in language teacher training and professional development).

Other partners: Schools, Department of Justice (Catalonia).

Overview: This experience represents a tripartite partnership, where responsibility between schools and institutional administration is also shared with private enterprises, as outlined in SDG 17 of the 2030 Agenda.

Teaching and Learning techniques: Collaborative work, task-oriented approach, problem-solving adventure, gamified routines in a 3D virtual reality.

Hypothesis: The educational adventure, designed as a serious game, can empower gender equity (SDG 5) and it activates the leadership role of girls

in promoting peace and justice within the team (SDG 16). It demonstrates the risk to life on land (SDG 15) and it allows students to explore ways to assure good health and well-being (SDG 3), among other UN-2030 sustainable development goals.

Assessment: Participants and researchers applied qualitative analysis and action-reflection (satisfaction surveys, and interviews with students and teachers), and quantitative gender comparison of interests and skill development consciousness.

Results of Research: Data shows that girls left the initial leadership to boys, but once engaged in the game, girls are willing to accept team-leadership to advise and direct the boys from a distance. Girls were initially reluctant to use the VR glasses, and boys were more adventurous when using the m to navigate on Mars. Girls were more creative when exploring possible solutions for specific tasks. When using basic literacies and skills to solve the given tasks, gender seems to have a meaningful impact on different levels and kinds of assertive behaviour. Full collaboration is better accepted in mixed gender teams than in mono-gender teams. Teachers detected different patterns of self-regulation during the 3D-game than in ordinary classes. Both boys and girls declared that the y were aware of how important it is for the m to learn new digital technologies as preparation for future jobs. Both boys and girls were equally sensitive to issues of climate change and social inclusion, during and after the game.

This type of activity provides multiple paths for exploring and implementing the UN-2030 SDG's in an educational context. It can also offer excellent opportunities for research. It helps teachers and institutions detect adolescents' interest in learning about technology, it promotes digital professional development among educators, it generates initial analysis of gender preferences and attitudinal tendencies during collective debates, and it favours action-oriented team mediation among young citizens. The se and other 21st century skills are widely demanded in the labour market, and the y are necessary in adult schools, and very well considered by the students the mselves.

More experiences should be developed in different educational ecosystems, and more studies of digital psycho-pedagogy and educational technology are necessary to develop a proper knowledge base of the state-of-the-art in smart pedagogy, related to readiness and acceptance of VR, and other emerging digital technologies at school, among teachers, families, and students (Lorenzo & Gallon, 2019) (Borawska-Kalbarczyk, Tołwińska, & Korzeniecka-Bondar, 2019)

Theoretical Correlations

The study of the oretical correlations between different cognitive paradigms can help develop a framework for smart pedagogy and digital transformation. The most common pyramid of cognitive processes (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956) is widely used in education to explain high level thinking processes, to plan activities, and analyse educational proposals, in six levels of complexity (knowledge, comprehension, application, analysis, synthesis, evaluation). The revision of the se levels, almost half a century later, presented a more dynamic approach, transforming nouns to verbs and changing the tip of the pyramid: remember, understand, apply, analyse, evaluate, create (Anderson, et al., 2001).

Comparing those two cognitive continua with more a modern pyramid of gamification, the highest concepts in the pyramid show similar levels of complexity (Werbach & Hunter, 2012). The alignment between the se learning levels can create an interesting analytical paradigm for educators, that provides reflection space for academia: a first level of explicit components (objects, ideas, elements), a second level of mechanics (relationships, dependences and organic relevance) and a third level of dynamics (social transformation, integral changes and ethical evolution). The se three levels correlate with explicit, implicit and meta-cognitive information, and can be used to describe assessment levels and evaluation challenges.

Assessing and classifying personal experience and decision making using serious games (Csikszentmihalyi, 1990) already provides a potentially useful way to develop social behaviour studies in virtual spaces. New sequences of activities and new pedagogical ideas can emerge when exploring teaching and learning hierarchies in correlation with ethical behaviour and well-being in the digital world (Marope, Griffin, & Gallagher, 2017). Marope's UNESCO team has developed a well-adapted representation of the information continuum in education, that can be integrated into real life when learning about the world:

1. Remember Data
2. Understand Technology
3. Apply knowledge
4. Analise skills
5. Evaluate values
6. Create attitudes.

A transversal overview the se different learning taxonomies can offer interesting correlations, as shown in Figure 4.

A complete chart would integrate artificial intelligence by adding the micro level of machine learning, and the meso level of smart technologies

to explain, apply, and transform future technology development in education. Table 2 presents the authors' proposed basic framework for developing a smart pedagogy of digital transformation, following the three domains of social cognitive development: explicit information, implicit knowledge, and abstract meta-reflection (Lorenzo Galés & Gallon, 2018, p. 26).
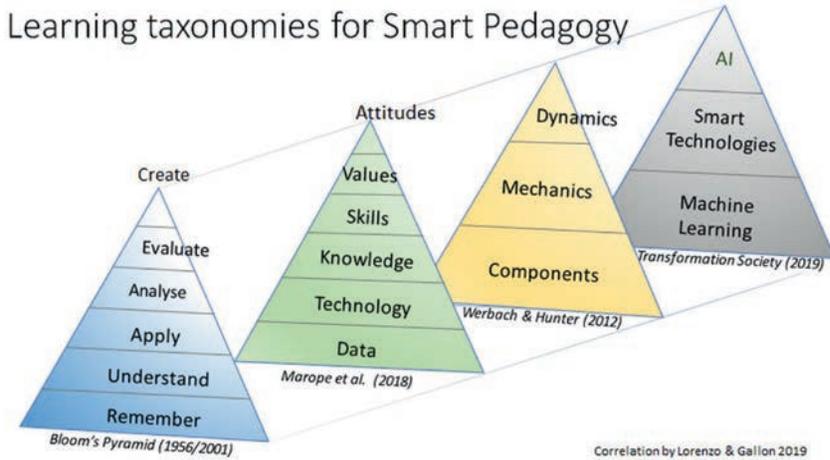
Figure 4. Correlation between cognitive taxonomies and learning the ories

Table 2. Proposals for a smart pedagogy framework – correlation between teaching and learning goals for transforming education. Source: the authors

Smart Pedagy for Digital Transformation	Students' Cognitive Processes	Teaching and Learning Paradigms	Ethical challenges
Level 3: To evaluate and encourage the transfer of sustainable transforming practices	Create	Creating attitudes	Monitoring AI Dynamics (promoting Ethics)
	Evaluate	Evaluating values	
Level 2: To facilitate processes and develop networks for building transformational education	Analyse	Analysing results	Appropriate mechanics of Smart Technology (personalising teaching and learning processes)
	Apply	Applying technology	
Level 1: To identify digital learning goals for transforming educational ecosystems	Understand	Understanding information	Exploring the components of Machine Learning (avoiding bias, spotting defective algorithms)
	Remember	Remembering data	

Future Challenges

We should want to have AI behave at our best, not copy our worst
-Martin Ciupa

Throwing technology at educational processes will not give us a pedagogy that can claim to be "smart." If we aren't capable of coupling higher level thinking, serious analysis, and value-oriented actions to it, we'll just have proliferation of means without meaning.

The technologies that define the fourth industrial revolution, especially artificial intelligence, are so powerful that the ir deployment at great scale automatically implies equally great social and economic changes. As educators, we have a responsibility to help our students understand the role of the se technologies, how the y fit into a changing world, and the ir use for achieving the greater good.

This means that to identify truly transformative digital learning goals, we must be ready to face questions of cognitive bias in AI algorithms. For example, how should we intervene on an unjust algorithm? If it used statistical analysis to decide who would be a successful coder, an AI agent would most likely never pick a woman, because of the gender biases that exist today. This would not be a desired outcome for SDG 5's aim of gender equality. Can we develop both algorithms and human methodologies for detection and verification of fake news? The processes inside deep learning algorithms are invisible, even for the programmers who created the m. Can we instruct an algorithm to reveal its processes, so that we can maintain traceability, and through it, accountability?

Our facilitating processes must help us to personalise teaching and learning without isolating students in a solitary digital bubble. If an algorithm is constantly encouraging a student to work on problem areas, might it not miss an opportunity to facilitate the student's work in areas of strength and ability? We human educators must ensure that over-automation does not lead to systemic damage, simply because no one questioned the decisions of an AI agent.

One of our greatest challenges, the n, will be to offer students the wealth of potential empowerment that AI represents, and at the same time help the m develop the critical thinking that will allow the m to remain vigilant on questions of human-machine collaboration, the balance between personalisation and community needs and values, or responsibility issues.

Above all, it is important that the use of the se technologies, in education as in other aspects of professional and personal life, be imbued with a humanistic, ethical purpose, connected to notions of sustainable development at individual and collective levels.

A smart pedagogy for the digital age is one with head in the sky, and feet on the ground. It's a pedagogy that helps students acquire the skills the y need to thrive in 21st century society, regardless of what professions or interests the y pursue. And it's a pedagogy that adapts to new relationships between humans and machines in a way that reminds us of our own best qualities, and encourages us to realise our greatest human potentials.

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UNDERSTANDING THE EDUCATIONAL RATIONALE BEHIND LEARNING IN VIRTUAL REALITY: A HISTORICAL DEVELOPMENT VIGNETTE

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ABSTRACT

Over the centuries fast developing technology has always had the power to transform learning and education in previously unimaginable ways, but even with an abundance of options, meeting the needs of learners has become something of a competition to provide meaningful and effective learning modes and designs. Currently learning is seen as an engaging process which provides experiences and allows learners to develop skills and competences of different cognitive, emotional and psycho-motor complexity. Indeed, analysing and understanding the diverse needs of learners as well as designing the most effective stimuli for desired learning outcomes – being that topical or contextual knowledge – has become pivotal for educators, instructional designers, researchers and learning technology engineers. Thus, in order to design VR learning experiences, as well as to effectively learn using VR technology, it is instrumental to fully understand the educational rationale behind learning in VR and the affordances of VR space as a learning vehicle. This article presents a brief historical development vignette of the tectonic shifts in learning theories with the aim of providing a comprehensive view of the synergy between the theories that are most prominent in understanding the rationale behind learning in VR, and through that to offer a roadmap for further research. This study is based on an extensive literature analysis of learning theories related to learning in VR, including, Constructivism, Constructionism, Technology enhanced learning, learning taxonomies for classification of learning objectives and development stages and instructional models.

Keywords: learning theories, virtual reality, cognitive pedagogy, instructional design, education.

Introduction

For centuries education has been entrusted with the responsibility of enabling individuals to access knowledge and practical learning experiences in order to become active and competitive members of society and through that to ensure further sustainability of those societies. Questions as of how to better acquire, transfer, collect and structure knowledge, skills and

competences have been part of society much earlier than the first academic attempts to understand their conceptualisation or definition. Through the process of creating multi-layered synergies and continuous disruption of the status quo – increasingly fast-developing technology has had the power to transform learning and education in previously unimaginable ways but, even with an abundance of options, meeting the needs of learners has become something of a competition to provide meaningful and effective learning modes and designs. Currently, learning is thought of as an engaging process which provides learning experiences and allows learners to develop skills and competences of different cognitive, emotional and psycho-motor complexity. Indeed, analysing and understanding the diverse needs of learners as well as designing the most effective stimuli for desired learning outcomes – being that topical or contextual knowledge – has become ever so pivotal for educators, instructional designers, researchers and learning technology engineers. Thus, in order to design VR learning experiences as well as to effectively learn using VR technology it is instrumental to fully understand the educational rationale behind learning in VR and the affordances of VR space as a learning vehicle.

Since 1956, Bloom's Taxonomy of Educational Objectives: The Classification of Educational Goals (Bloom et al., 1956) has been the standard for the systematisation and classification of educational objectives. Later, a former student of Bloom's –Anderson together with Krathwohl published a revised version of Bloom's Taxonomy in 2001, proposing the use of verbs over nouns to define the learning outcomes as competences or acquired skills and abilities. It must be noted that Anderson and Krathwohl considered creativity over evaluation within the cognitive domain (Anderson et al., 2001). Various taxonomies were developed by Instructional Design practitioners and researchers, such as Gagne's taxonomy which defined five levels of learning: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes, and nine events of instruction which corresponded to learning processes (Gagne, 1985). Gagne's taxonomy classifies the learning process in terms of the degree of complexity of the mental processes involved. In 2007, Churches further developed the taxonomy proposed by Bloom, and Anderson and Krathwohl and published a Digital Taxonomy, which complements existing taxonomies of learning outcomes with six levels of digital skills (Churches, 2007).

Since the mid-1950s and all through the 1960s there was an ongoing, yet pivotal shift in education psychology from teaching and towards learning. Learning has always been, and will continue to be, a way for society or an individual to adapt to socio-economic changes as well as to foster them, thus creating a cyclical and ever-evolving process. An increased interest in learning also further steered academic discourse towards

the potential of learning environments – both physical and social. Since the 1980s technology enhanced learning (TEL), often used synonymously with technology enabled learning (TEL) or technology enhanced education (TEE), have all gained increasing focus in the field of educational research. TEL was gaining its popularity in adult training as well as school classrooms, thus constantly pushing researchers and practitioners to look for more effective ways to apply existing learning models as well as to understand where TEL should be positioned.

Since the early 2000s, one of the most notable shifts in education has been the increasing use of the 'flipped classroom' approach. This method of blended learning focuses on delivering the content outside the classroom, often characterised as self-paced online lectures, thus allowing the classroom environment to become the primary platform for collaborative learning and further elucidation.

The use of a desktop computer was further revolutionised by the rapid development of user-friendly technological advancement, thus further extending learning possibilities to online platforms, smartphones and tablets. These developments served as further stimuli for the advancement of digital learning content and its application and interaction in order to achieve learning objectives. There has been much discussion around the question of whether e-learning can and should completely replace traditional learning models. Thus, currently the concept of blended learning is at the forefront. "Blended learning designates the range of possibilities presented by combining Internet and digital media with established classroom forms that require the physical co-presence of teacher and students" (Friesen, 2012, p. 1.). These technologies have transformed learning and have changed its position from being a support tool (mainly for visual, audio and video materials), to it asserting itself in the central role as a method of content delivery. In addition, this evolution has affected content creation itself, as there has been an increasing need for interactive content which would aid memory and attention retention (especially in younger learners), learner-friendly layouts and structures as well as formats (e.g. video lectures). This need to interact in pair with the constant battle against dehumanisation of the learning process in turn has directed the attention of instructional designers to the immense possibilities of computer-generated simulations, which have been used for complex learning skills in aviation, army, navy and engineering since the 1960s. These computer-generated simulations were an attempt to realise a presumption that a learner should experience a stronger response (including memory and attention retention) to an experience, rather than to an abstract theoretical discussion of concepts, because, with simulation, (more precisely emulations) it is possible to fool the brain into believing it actually has had the real experience of

performing a task or having had a certain remote or new experience. Thus, the name of the latest technology, which is the focus of this study, comes directly from the combination of two main attributing terms – 'virtual' and 'reality'. As defined by the Virtual Reality Society: "the definition of virtual reality comes, naturally, from the definitions for both 'virtual' and 'reality'. The definition of 'virtual' is near and reality is what we experience as human beings. Respectively, the term 'virtual reality' basically means 'near-reality'. This could, of course, mean anything but it usually refers to a specific type of reality emulation" (2017).

Virtual Reality has fascinated people since the 1950s (e.g. Heling and Sutherland) and since then it has increased its presence in our lives, not only through entertainment but also in the way it has affected and transformed medical procedures and services, first-response and the military, engineering, architecture, businesses, sports, arts, and technologies.

There has been a lot of excitement about the potential of VR technologies, and it must be noted that various 'tech-gurus' grew impatient during the continuous evolution of VR technologies and persistent attempts to make it accessible to the masses. One of the leading industries to be dramatically transformed by VR is education (Kapp, 2017 and CB Insights, 2018) and especially over the past decade, it is evident that VR indeed has transformed education in both senses: traditional classroom education and technology enhanced learning. Nevertheless, recent educational research does agree that there is still immense potential for further applications of VR for learning and the solutions it can offer (see Salzman, 1999; Kapp, O'Driscoll, 2010).

VR is already showing its benefit to the flipped classroom model. For instance, Google Expeditions – a software that enables students to virtually travel to exotic locations, adding context to history and geography lessons. Companies such as Immersive VR Education are using dynamic storytelling to better help students to engage with their subject material. VR has captured people's imagination and designers, developers, and enthusiasts have devoted countless hours to design, code and explore the possibilities of this exciting emergence of a long dream about the medium. Now there are various affordable and fast hardware systems such as Google Cardboard, Google Daydream View, the Oculus Go, Oculus Rift, Oculus Quest, Oculus Vive, Samsung Gear VR and HTC Vive enable consumers to experience high-quality VR first hand.

Educational rationale behind learning in Virtual Reality

Practitioners and researchers have been concerned with how learning takes place since the advent of civilisation. Just in the past two centuries a significant number of theories on how learning occurs have been
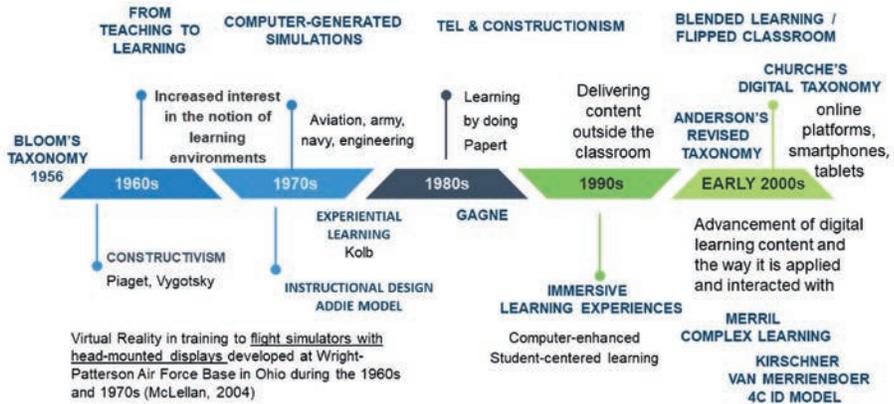
Figure 1. Development Vignette: Educational Psychology – Instructional Design – VR Technology, Author's concept

developed and introduced into educational practice internationally. In order to design VR learning experiences as well as to effectively learn using VR technology, first, it is necessary to look at the existing theories of learning, proposed models of the organisation of learning and the main shifts in academic discourse that have taken place since the 1950s.

To frame the discussion and in order to illustrate the tectonic shifts that have taken place in the fields of education, cognitive psychology, instructional design and VR technology, a historical development vignette is proposed by the author, see Figure 1.

Constructivism

Constructivist theory was developed in the mid-20th Century by several prominent educators, philosophers and academics. Two of the most prominent, which are often associated as synonyms of the theory itself, are Jean Piaget and Lev Vygotsky. Although their theories differ on a variety of detailed principles, there is an intertwining set of general principles which are viewed as the general constructivist theory (See Fig. 2). Both theorists believed that learners generate new knowledge and comprehension through building upon previously existing experiences, and those interactions between the experiences and the new information serve the point of 'knowledge construction' (Vygotsky, 1962, Piaget, 1976). Constructivism also argues that each individual's set of experiences and prior knowledge is different and unique, and thus, knowledge construction for each individual or potentially a homogenous group is different. Constructivism views learning as 'active' rather than 'passive'; thus one of the most significant contributions of this theory is the 'learner-centred' (sometimes also referred to as 'student-centred') approach rather than the content-centred

approach to learning. In both Piaget's and Vygotsky's proposed approaches, educators have rather a support and guidance role rather than primary role of teaching new knowledge and skills and thus determining the course of a learning experience.

BOTH BELIEVED
- Development is organized in sequential order
- Importance of cooperation in process of learning
- Experiences are pivotal to development
- Focus on environment (physical and social) as the facilitator of learning

PIAGET
- Four stages of intellect – from birth to young adulthood
- Cognitive structures have to be in place before certain types of learning can take place
- Learning takes place best when engaged in practical activities
- Focus on Nature

VYGOTSKY
- Growth is achieved through interaction with environment and people
- Self-regulation
- Support (scaffolding)
- Focus on Nurture

Figure 2. Overlap in Constructivist ideas – Piaget and Vygotsky, Author's concept

Social constructivism, a branch of constructivism, emphasises the importance of socio-cultural contexts of learning. Vygotsky believed that learning is dependent on social interaction and that 'social learning' actually leads to cognitive development (Vygotsky, 1962). Vygotsky emphasises the role of an educator as a support, guidance and scaffolding mechanism, as he believed that learners can perform tasks which otherwise they could not complete on their own, if given the necessary guidance or scaffolding, or alternatively through collaboration with their peers. This can be seen as a significant step towards experiential learning and instructional design in the future, as Vygotsky's model for teaching stresses the importance of learning opportunities and indeed, their design. He also believed that the type and quality of social interactions (culture, language, role-models to the student) determine the design and degree of development.

Constructivist learning theory is rooted in the premise that learning is an active process, where through various supportive mechanisms (environment – both physical and social, information, guidance) learners develop connections with their prior experiences and knowledge and thus layer on or 'construct' the new knowledge, skills and attitudes. For the further development of

learning in a virtual environment, this shift can be noted as one of the, pivotal moments when the academic discourse of the early constructivists, such as Wittrock and later Bloom, shifts its attention from 'teaching' to 'learning'. The course-changing impact of Piaget's theoretical ideas in educational psychology has in turn generated a great deal of research which has furthered our understanding of cognitive development and learning processes. Nonetheless, it also generated a notable amount of criticism; for instance, Vygotsky and Bruner (1966) in contrast to developmental stages, defined cognitive development as a continuum. Some later studies (Keating, 1979) critiqued Piaget, for neglecting the impact of socio-cultural environment on the cognitive development including the defined age ranges and development stages, and focusing only on the biological factors.

Nevertheless, constructivism is based on similar founding assumptions about learning and is one of the foundational theoretical inputs for learning in VR. There are two significant reasons why these theories serve as the foundation for this inquiry. First, constructivism places a great deal of importance on the creation of the suitable environment for knowledge construction rather than for its mere transfer from educator to learner, as the theory advocates knowledge construction, not knowledge reproduction. Secondly, constructivism stresses the importance of collaborative learning. These aspects are key to application of these pedagogical theories in order to study learning in VR, as the significance of the learning environment and collaborative experiences, draws direct parallels with the benefits of technology enhanced education including VR technology enhanced learning. Thus, this pedagogical framework will aid in designing and utilising VR learning experiences through learner engagement (environment) and prior experience based knowledge construction, thus facilitating the development of new knowledge and competences, such as critical and analytical thinking.

Constructionism

Constructionism theory, emphasises experiential discovery learning, where individuals or groups can learn and construct knowledge through practical, real-world tasks and experiences (Papert, 1991). During the 1980s Papert, who was also a mathematician, computer scientist, and one of the artificial intelligence (AI) pioneers and educators, developed the theory of Constructionism. Papert believed in learning by doing (Papert, 1980, 1993a, 1993b). He stressed that technology together with constructivist learning approach created opportunities for learners to construct new knowledge and new innovative ways of thinking. For Papert it was important to visualise the process of knowledge construction, thus allowing for more engaging experience. A strong parallel with constructivist theory is that Papert viewed learning as a pro-active process rather than

passive as constructionism stresses enabling and learning versus teaching. Papert is often given credit for utilising technology in learning. Another strong similarity is a learner-centred approach to learning. Constructionism can be viewed as a branch of a constructivist learning approach, yet constructionism focuses on instruction rather than studies the process of learning. If there is a notable difference in the two theories discussed, it is that constructivism rather stresses the cognitive potential, whereas constructionism stresses the potential of the physical activity.

"Constructionism can mostly be found being used as an educational tool in science and math classrooms, though it is spreading to other subjects as well. Today, there is an increasing popularity for robotic technologies used in the classroom. Specifically, there has been a focus on "white-box" digital tools, which teach the user or builder about the structure of the technology itself, in contrast to "black-box" software or technology, which conceals the method of its creation and is closed to any modifications by the user or builder" (Alimisis & Kynigos, 2009, p. 11).

In order to highlight the synergy with learning in VR, it must be noted that, the core statement of constructionism is that learning transpires through the process of creation both individually or collectively and that creation and co-creation can be achieved due to the affordances of the learning environment. Both in constructionism learning theory and learning in VR it is pivotal that the process of learning enables learners to have a close-up ownership over the learning process and its outcomes, while the educators and the learning environment provide the necessary guidance through scaffolding and feedback.

Technology enhanced learning

As highlighted in the Introduction, there is a variety of alternative terms used to discuss issues linked to technology and learning, however much of the discussion has been about how technology-enhanced learning (TEL) has been used, which is viewed as the application of ICT to achieve learning objectives.

According to Salomon: "Computer-based learning environments are not learning environments to which computers have been added … Rather, these are relatively new environments in which computer-afforded activities have been fully integrated into other activities, affecting them and being affected by them" (1992, p. 252).

This principle directly transcends to development and organisation of TEL, as there are similar considerations as well as benefits and limitations imposed by the application of technologies. Various researchers have asked how technology enhances the value of learners' experiences. At the core of the TEL concept is the implication of a value 'upgrade' as a result of utilising

technology for the betterment of the teaching and learning strategies. The description itself suggests that enhancement should be understood as a value judgement meaning improved quality or added value. Moreover, several academics (Kapp, O'Driscoll 2010; Kirkwood, Price, 2013) have raised questions, such as: what exactly can and should be, or in particular instances, is enhanced when technology utilised? How can an enhancement be evaluated and monitored?

These questions, as well as the potential benefits and risks concerned with TEL approach are similarly relevant to learning in VR, as without a strategic understanding of how the affordances of VR learning environment can and should be utilised, as well as how to evaluate, potentially measure and analyse this enhancement it can be really easy to fall into technology fascination effect. Furthermore, many of the TEL instructional design and teaching strategies can be applied to designing VR learning experiences and teaching using VR technology.

Taxonomies and classifications of learning outcomes

Various learning theories have been discussed in the previous sections and it is vital to emphasise the importance of the existing knowledge in this field, as it will be used to further develop a theory for systematisation of learning principles governing learning in VR.

There is a significant body of research available on the subject, yet for the purposes of this study, the following theories, ideas and classifications are explored and synthesised: Bloom, 1956; Gagne, 1985; Anderson and Krathwohl, 2001; Churches, 2007, Merrill, 2002, Kirschner and van Merriënboer, 2008. Some of the 'early' taxonomies include: Bloom's taxonomy (1956), the ADDIE model (1957), SOLO taxonomy by Biggs and Collis (Biggs & Collis, 1982) and Gagne's taxonomy (1985).

In order to address the various classifications and taxonomies, the term Instructional Design (ID) will be introduced into the discussion, as it is often defined as the principal objective of such taxonomies and classifications, and also because it is often used in literature as an inter-changing alternative for learning – experiences, strategies, process mapping, management and monitoring.

Various taxonomies developed by ID practitioners and researchers (e.g. Gagne's Taxonomy (1985), and Bloom's Taxonomy (1956)) further reinforce the roots of Instructional design, both as a concept and a practice, reaching from cognitive and behavioural psychology, through constructivism, constructionism and TEL. "Instructional design is intended to be an iterative process of planning outcomes, selecting effective strategies for teaching and learning, choosing relevant technologies, identifying educational media and measuring performance" (Branch & Kopcha, 2014, p. 77).

The objective of ID, or instructional systems design (ISD), is "instructional experiences which make the acquisition of knowledge and skill more efficient, effective, and appealing" (Merrill, Drake, Lacy, Pratt, 1996, p. 5). The practice includes analysis of the learners' (or groups) current setting and prerequisites, later mapping out the needs of the learner, defining learning outcomes and the overall goals, followed by a designed learning experience, often described as an 'intervention'. Since the 1950s there have been approximately two hundreds instructional design models; however, conceptually, there are four conceptual models (Dick & Carey, Kemp ISD, Guaranteed Learning / IDLS, First Principle of Instruction, Complex learning) yet most of them were derived from the ADDIE model, which is based on five stages of instruction: analysis, design, development, implementation, and evaluation.

One of the most renowned early models, developed by the Centre for Educational Technology at Florida State University for the U.S. military sector – ADDIE was developed in 1975.

Various taxonomies were developed by Instructional Design practitioners and researchers, including Gagne's Taxonomy which defined five levels of learning: verbal information, intellectual skills, cognitive strategies, motor skills and attitudes, and nine events of instruction which correspond to learning processes (Gagne, 1985). Gagne's Taxonomy classifies learning process in terms of the degree of complexity of the mental processes involved, (see Figure 3). Subsequently, Churches further developed the taxonomy proposed by Bloom and Anderson and Krathwohl and published a digital taxonomy, which complemented existing taxonomies of learning outcomes with six levels of digital skills (Churches, 2007).
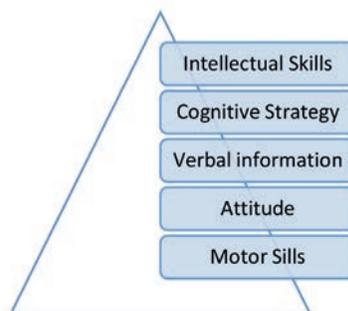
Figure 3. The Gagne's Taxonomy, Author's concept

Another significant direction for more contemporary learning models has been developed by Merrill, followed by Kirschner and van Merriënboer. The First Principles of Instruction (Merrill, 2002) is a model based on

a synthesis of many earlier ID theories. The model focused on the aspects which were in common to the various ID theories, thus establishing the fundamental essence of ID through a set of principles. First Principles of Instruction can be applied in a Task or Problem-Centered cycle of instruction, (See Figure 4). The model draws close parallels with other task-centred instructional theories, such as Kirschner and van Merriënboer (e.g. Four Component Instructional Design Model – 4C ID) as it uses a real-world problem or task as an instrument for instruction. Students observe demonstrations of examples of real-world problem solving, then are given opportunities to solve real-world problems themselves, while supported through feedback. Learning in context is pivotal in both the First Principles of Instruction and the 4CID model, as context becomes the core learning environment for deep learning.
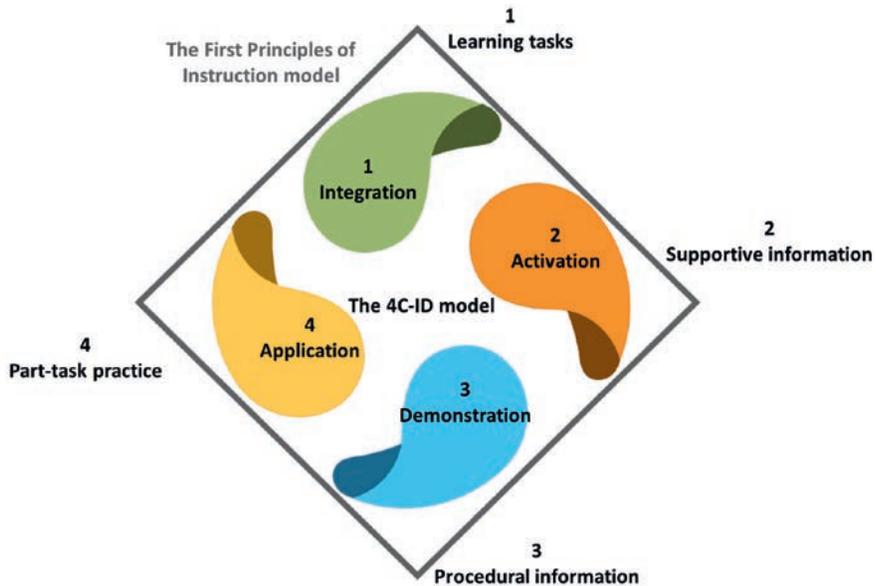
Figure 4. The First Principles of Instruction and the 4CID model, Author's concept

Works of Merrill (2002), Kirschner and van Merrienboer (2008) are of great significance to the understanding of how learning in VR should be organised and utilised, for a two main reasons:

1. Merrill attempts to synthesise most prominent ID approaches and models, thus providing a crucial impetus in presenting a comprehensive model for how learning takes place and to highlight the most effective ways to organise the learning process.

2. Kirschner and van Merrienboer's 4C ID model presents a blueprint for complex learning, which is real-world based problem-solving. The model emphasises the real-world setting and supporting contextual information as well as varying and with progress – diminishing guidance to a learner.

Thus, Merrill's model allows understanding of the general principles of the creation of learning experiences, while Kirschner's & van Merrienboer's model, in fact, draws strong parallels with the principles often attributed to learning in VR, such as real-world simulation, contextual learning and varying guidance levels.

Conclusion

The theories explored in this study all have one central element in common – the potential of experience as an essential part of learning. Yet, it must be noted that there is no one single theory which would fit all, as there is no one form of learning that fits all objectives and all learners.

Constructivism and constructionism provide the best theoretic foundation for understanding of learning principles that govern learning in VR. Thirdly, Constructivism, Constructionism and TEL all emphasise the importance of a learner-centred approach to learning, where a learner takes an active role rather than a passive role. Next, the three learning theories, all emphasise the crucial importance of the learning environment thus accentuating the potential of VR technology application.

Meanwhile, the literature on VR learning argues that VR provides unique opportunities for learners to access learning experiences that otherwise would not be accessible as part of their formal classroom based education, and thus through VR to take part in that learning experience as it would have been a first-person experience.

For further research, a more detailed cross analysis of aspects of VR learning ecosystem that fit with the key facets of each of the major 20th Century learning frameworks can be found in Dreimane, 2019 Virtual Reality Learning Experience Evaluation Tool for Instructional Designers and Educators In Daniela L. Eds. *New Perspectives on Virtual and Augmented Reality: Finding New Ways to Teach in a Transformed Learning Environment. Taylor&Francis.* ISBN 9780367432119.

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INTERDISCIPLINARY COMPUTING FOR STE(A)M: A LOW FLOOR HIGH CEILING CURRICULUM

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ABSTRACT

There is an international, 360° effort to sustain and support education involving citizens of every age, all educational systems (formal, not formal, and informal), all levels of education (from primary schools to higher education), all disciplines (from Math to Latin), and all stakeholders (from educational institutions to industries and businesses).

In the paper, after reviewing the state of the art in Computing (C), Computational Thinking (CT), Computer Science (CS) and Digital Literacy (DL), a curriculum suited for a first course in computing, rooted in international frameworks and curricula, will be discussed. The work will present a detailed discussion of the content of a computing curriculum, suited for education across Europe, and its interdisciplinary applications. The curriculum can be useful for pre-service teachers' preparation, teachers' Professional Development (PD) and high school students. It develops along three strands: C, CT, and CS; DL used as a tool to document and present the artifacts produced in the C, CT, and CS projects, and soft skills introduced by contributions from leading researchers and educators around the world. The assessment practices, learning path, pedagogical approaches, and technologies, will be presented in order to aid teachers in their pre-service studies, PD, and daily teaching practice.

Keywords: Computing; Computational Thinking; Interdisciplinary Computer Science, Teacher preparation; Subject Knowledge; Model curricula; Interactive ebook.

Computing, Computational Thinking, Computer Science, and Digital Literacy

There is an international, 360° effort to sustain and support education which involves: all citizens, starting from children at pre-school to grandparents; all education systems, from formal to informal and even non-formal; all levels of education, from primary schools to higher education and lifelong learning; all disciplines, from Math to Latin and Ancient Greek: all stakeholders, from the education system to industries and businesses.

Parallel to this effort, a worldwide movement is striving to introduce the study of computing (Luxton-Reilly et al., 2018) from the first day of

school, alongside reading, writing and basic arithmetic, and sustain this study throughout the life-long learning journey. This strong effort has produced a revision of mandatory state level curricula such as the Computing Curricula in England (DFE, 2013), the Australian curriculum (ACARA,, 2016), the New Zealand Technology curriculum (TKI, 2017), the Computer Science Teacher Association K-12 Framework (CSTA, 2016) and Standard (CSTA, 2017). In the USA, code.org (Code.org) has been one of the most important non-profit organizations pushing for the introduction of CS across all states.

In Europe, a key role in this process has been taken by the European Commission and the European Schoolnet in cooperation with leading educational organizations such as OECD (OECD, 2018) and ACM Europe (Caspersen, et al., 2018). In this scenario, a question naturally arises about what are the competencies and skills that 21st-century citizens have to develop in their life. Among these competencies and skills, Computational Thinking (CT) (Wing, 2016)continues to plays a key role (Bocconi, et al., 2016), despite the long debate (Tedre & Denning, 2016) going back to the 1940s (Denning, 2017). All disciplines could potentially benefit from CT in a vision advocating for a shift "from STEM to STE(A)M (where 'A' includes all other disciplines)" (Hazelkorn, et al., 2015) bringing into the educational loop all stakeholders, from educators to industries and Ministries of Education (European Schoolnet, 2016). In this, the Scientix project (Baldursson & Stone, 2015) has a leading role ensuring, among many other things, that "no teacher faces unaided the hard but most needed task of getting kids to know, like and dream about science". According to the various operational definitions of CT (Csizmadia, et al., Computing At School, 2015), (Computer Science Teachers Association, 2011), (International Society for Technology in Education, s.d.) it is possible to argue that

- CT can be interpreted as a transversal set of skills that can be used as a means to acquire and to develop broad competencies like the ones proposed in (Binkley, et al., 2012).
- "more tools in the mental toolbox seems like a worthy goal" (Denning, 2017).

In order to realize this world-wide effort it is necessary to leverage teachers, the heart of the education system, and by leveraging their pedagogical and professional experience, offer resources for filling content gaps that could be present when teachers have majored in a different field than computing. Pre-service (Blamire & Cassells, 2019), (Maiorana, et al., 2019) and in-service Professional Development (PD) (Morelli, et al., 2014), (Lucarelli, et al., 2017), (Maiorana, et al., 2017) represent another way to enhance teachers' confidence in teaching computing. Other great examples of supporting initiatives of this widespread movement are represented by

informal and outreach actions offered by international movements and initiatives like CoderDojo (CoderDojo, 2013), Europe code week (Europe code week, 2014), and communities of practices like Scientix (Scientix, s.d.).

All this effort has been supported by a strong, international 50-year research effort documented in (Luxton-Reilly, et al., 2018), (Becker & Quille, 2019), (Medeiros, et. al., 2018). In this process a tension in the school system is apparent: on one side the need to offer a quality and inclusive education accessible to all students (UNESCO, 2017), (Burgstahler & Cory, 2010), (Burgstahler S. , 2013) and, on the other, the necessity to increase the level of abstraction and cognitive demand in order to prepare the students for the higher cognitive skills required by the job market (Manca, 2018), (Ferrari, 2013).

The necessity of this synthesis is confirmed in many educational frameworks such as JRC (Bocconi, et al., 2016), the assessment in teaching of 21st century schools project, (ATC21S) (Griffin & Care, 2014), Advanced Placement Computer Science Principles (College Board, 2017), Computer Science Teachers Association (CSTA) (CSTS, 2016) (CSTA, 2017), Organisation for Economic Co-operation and Development (OECD) (OECD, 2018), United Nations Educational, Scientific and Cultural Organization (UNESCO) (UNESCO, s.d.) that highlight a rich set of skills that students have to nurture.

In this paper the author presents a curriculum suited for a first course on computing by highlighting the design principles, and the learning trajectories. The three principal strands of the curriculum, namely Computational Thinking, digital literacy, soft and social skills are then presented. An evaluation of the proposed curriculum, a discussion summarizing main lessons learned, and conclusions and further work considerations complete the work.

Design principles

The curriculum aims to offer content and learning materials for a first course in computing suitable for all teachers and their students which, with adequate motivation, can be supported in climbing the learning pyramid from mere knowledge to creativity.

The fundamental ideas inspiring the curriculum are:

1) A low floor entry point suitable for all students and a high ceiling supporting the curiosity of all learners
2) Inquiry-based approach
3) Emphasis on design supported by many design tools
4)`Different expressive registers
5) Block based languages supporting high cognitive skills

6) Many programming languages with a common interface
7) Many advanced topics
8) Multiple learning trajectories that can be personalized to the needs of each student
9) Interdisciplinary applications
10) Multiple delivery media, e.g. book, interactive ebook, online course, etc …

In order to reach the low floor, high ceiling goal we envisage a cycle in the design process involving unplugged activities (Bell, et al., 2015), design tools such as flowgorithm (Cook, 2015), visual block languages and puzzles with an increasing level of difficulty, supporting students in their problem solving process.

The choice of using visual block languages leverages on the necessity, which has arisen from the rapid technological growth and exponential growth of the amount of available information, to sharpen the high order cognitive skills sought after by today's labor market (Manca, 2018). Visual block languages allow learners to focus on problem solving and high-order cognitive skills, avoiding the necessity to acquire syntactical details required by textual languages. Those languages become necessary when other considerations, e.g. efficiency of execution, are of primary importance.

The learning material can be used for:
1) A first high school course on computing, e.g. for K9-K10 grade band (CASTA, 2016), (CSTA, 2017)
2) Pre-service teacher training without a major in computing
3) Teacher Professional Development (PD)
4) A first undergraduate course for students majoring in fields other than computing, e.g. the humanities.

The learning trajectories

Figure 1 depicts the main concepts in the curriculum and how they are linked.

The concept maps can be navigated along many routes leaving the teachers the possibility to adapt the content to the class and each individual student.

We envisage a learning trajectory with a focus on developing CT. This will be produced by guiding students in acquiring a broad set of skills, useful not just to future computing professionals (Denning, 2017). The curriculum has the following strands:
• Computational thinking
• Digital literacy
• Soft and social skills
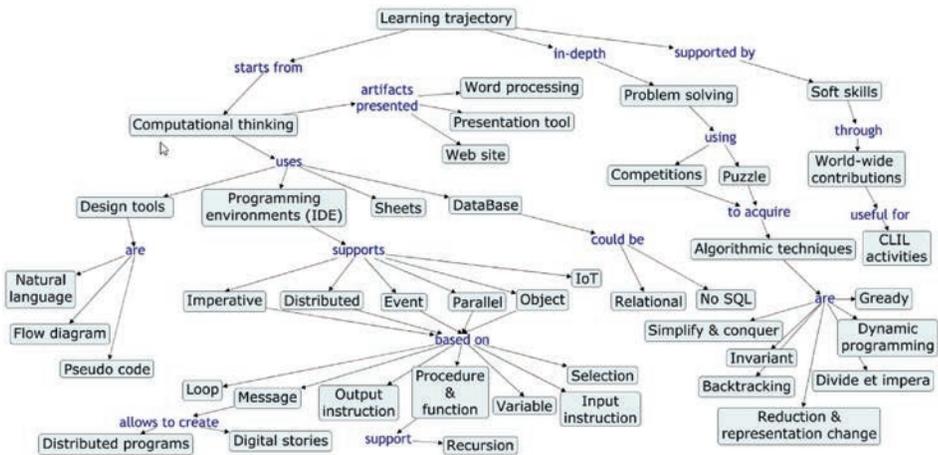
Figure 1. Curriculum concept map

The Computational Thinking strand

The CT strand uses a constructivist, student-centered approach grounded in cognitive theory/constructivism (Guzdial, 2018), and is based on the following activities:

- Reading, tracing, modifying and designing programs and algorithms expressed by means of:
  – Flow diagram (e.g. Flowgorithm)
  – Natural language
  – Pseudocode

Supported by activities requiring learners to translate from one representation to the others or to a visual block language

- Coding:
  – deluge of block languages, to experiment with core concepts in computing
  – translating the programs into a textual language
- Puzzle based learning:
  – algorithm design techniques: backtracking, divide and conquer, greedy, dynamic programming, invariant and so on.

The coding is supported by a deluge of block languages that, by sharing a common interface, allow teachers to leverage on their peculiar features to present and reason around core concepts in computing. Teachers can use the mutual support and reinforcement of the different programming and design tools, plugged and unplugged activities to offer a rich variety. For example, for parallelism unplugged activities such as the one proposed in (Bell, et. al., 2015), (Tennessee Tech, s.d.) can support the plugged activities.

The author envisages in the curriculum the mutual support of plugged and unplugged activities, visual block-based and textual languages, multiple design tools to provide teachers and students with a richer set of design methodologies, tools, and expressive registers allowing each one to find the one most suited to her/his needs.

Table 1. A partial list of visual block languages used with a suggested progression and the key features of each language

	Block language	Key features
	Scratch (Resnick, et al., 2009)	Easy to use. Movement, Pen, Control, Procedures
	Scrible (Lane, Meyer, & Mullins, 2017)	Write on the stage. Create shapes
	NetsBlox (Broll & Ledeczi, 2017)	Message with data. Distributed programming
	Snap! (Harvey & Mönig, 2010)	Function. Recursion and functional programming. Parallel programming (e.g. map – reduce)
	Tunely (Trower & Gray, 2015)	Multimedia data manipulation in one dimension
	Pixly (Trower & Gray, 2015)	Multimedia data manipulation in two dimensions
	App Inventor (Patton, Tissenbaum, & Harunani, 2019)	Event programming. Mobile app development. NoSQL database. IoT
	Cellular (Lane, 2012),	Biological system simulation
	Blop (Federici, Gola, & Ilardi, 2014)	Block language for C/C + +. Step towards textual languages
	BlockPy (Bart, Tibau, Tilevich, Shaffer, & Kafura, 2017)	Data manipulation. Automatic translation in Python
	Edgy (Cox, Bird, & Meyer, 2017)	Data structures. Bridge between unplugged and plugged
	GP (Monig, Ohshima, & Maloney, 2015)	Multimedia manipulation. Introduction to class without inheritance
	Parallel programming (Feng, Gardner, & Feng, 2017)	Blocks for parallel execution

The puzzle-based approach is a leitmotiv of the whole curriculum with puzzles proposed in all chapters and modules. Table 2 lists some of the major algorithm techniques and the puzzles used to introduce them. All the CT, and puzzle activities in the same module and across the whole curriculum, shows a progression from core to intermediate and advanced

with a clear indication provided in the companion teacher's book. For students, an icon indication can guide them in choosing the preferred activities. The progression is supported by clear and sharp classification and progression provided in (Levitin & Levitin, 2011).

Table 2. Algorithmic techniques with some examples of puzzles proposed in the curriculum

Algorithmic techniques	Puzzle
Greedy	Pearson, bridge crossing and lamps; Huffman code
Decrease and conquer	A fake among eight coins, fake coin detection with a spring scale;
Divide and conquer	Tromino puzzle, 2n counters in a nxn board
Change of representation	Two jealous husbands, Stack of fake coins, Drawing a figure without lifting the pen; sequence of words
Dynamic programming	Shortest path counting; Knapsack problem; Common subsequence, Palindrome counting
Invariant	Break a chocolate bar; Colour of last marble; Knight movements; domino and tetromino tiling
Inference	Sequence of facts and conclusion;
Backtracking	Four and n queens; CriptoAlgorithms & CryptoArithmetica
Induction, proof of correctness	Knapsack problem, divide a rectangle in triangles
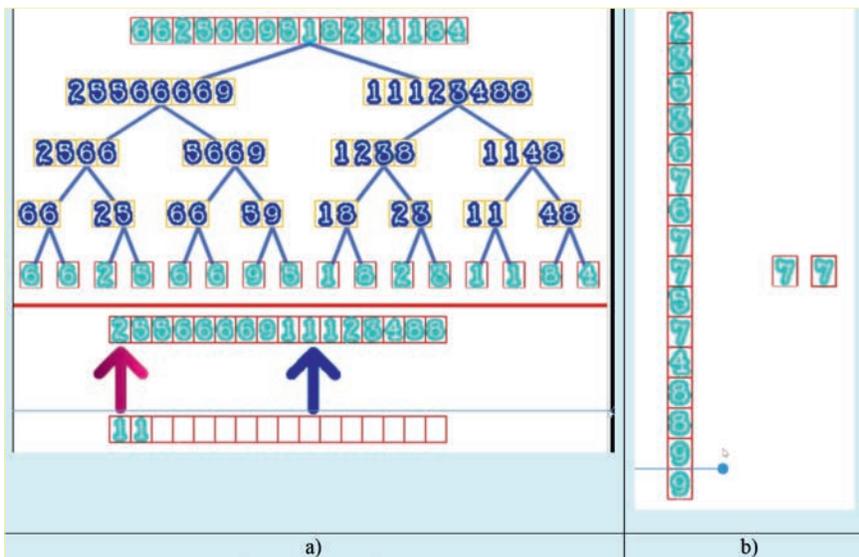
Figure 2. Sorting algorithm animations: a) Merge sort; b) Bubble sort

An inquiry-based approach is used to give the students a central role. Figure 2 shows a snapshot of two animations of merge-sort and bubble-sort. Students are requested to watch the animation and, before any educational intervention, are guided by a set of questions in discovering the algorithms behind this sorting processes. The set of questions goes into deeper detail in successive runs, e.g. midterm and final.

A similar approach is useful for algorithmic techniques such as backtracking. Figure 3 shows an example of a graph created with Edgy and its topological order.
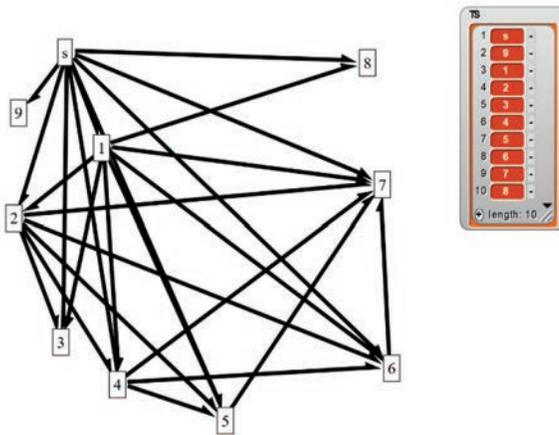
Figure 3. A graph and its topological order obtained with Edgy

The Digital Literacy strand

The digital literacy strand covers the following topics:
- Conduct bibliographic research.
- Being able to search, select, summarize, visualize and reference quality information. Particular emphasis is given to a rigorous process with clear and objective indications for every step: from selecting the search engine to selecting the best key phrases, for judging the source of information, verifying it and so on.
- Office automation. The major suites for office automation are presented, both proprietary, such as Microsoft, and open source such as LibreOffice and OpenOffice. Emphasis has been given to online and cloud-based tools as a way to hone collaboration and group work skills. To present the suites, an explorative approach is suggested, asking the students to find ways to accomplish tasks, either by exploration of the interface or by searching through the technical documentation. This is the best way to cope with

different interfaces changing over device, over software and over time. The explorative approach is always preferred and the correct solution, e.g. the sequence of steps to accomplish the task is given at the end of the activities, frequently only in the companion teacher's guide. Interface design principles are given by comparing the different interfaces available in the different devices (desktops, tablets and smartphones) and by analysing commonalities both intra applications inside the same family of software tools and inter office suites.

– Particular emphasis is given to searching, retrieving, analysing, visualizing and storing data. The importance of open and linked data is used as the key starting idea. Data are searched and retrieved and then analysed and visualized using Excel, Libre and Google sheets.

– Finally, storing data in databases (both relational and NOSQL) is considered. Activities for designing and querying a relational database and ways to visualize the data via an ad hoc designed interface are presented and suggested. The difference with a NOSQL database are explored and practical mobile applications are designed and developed by means of App Inventor and available NOSQL database components.

The soft and social skills strand

The importance of soft skills as well as social skills is recognized worldwide. For this reason, these topics are discussed through contributions from leading experts to open a window onto the world for students, giving them the possibility to compare the experiences from different countries and cultures. Among the topics covered, to cite just a few, it is possible to recall:

- Professional ethics
- Informal education
- Humanitarian Free and Open Source Software (HFOOS) – Free and Open Source Software (FOSS) (Hislop, Jackson, & Ellis, 2015), (Morelli, et al., 2009)
- Computer Science and its impact on society
- Inclusive education
- Mens sana in corpore sano (Healthy brain in healthy bod). Importance of sport
- Sustainable development
- Technologies and well-being

Contributions come from leading experts from: Australia; Canada; Europe: England, Ireland, Italy, Lithuania, Spain, Switzerland; New Zealand

and USA working in universities, international organizations, international institutions, enterprises.

This contribution can be used as Content Language Integrated Learning (CLIL) activities for students learning English as a second language.

Evaluation of results and discussion

The content derives from several experiences described and qualitatively and quantitatively evaluated in different studies (Giordano & Maiorana, 2014), (Giordano & Maiorana, 2015), (Maiorana, 2019). The positive effects of a first version of the curriculum have been evaluated by means of student progress on assessment evaluation and student survey (Giordano & Maiorana, 2015). Starting from the 2013 academic year, the curriculum was iteratively designed, developed, deployed, evaluated and improved. Each year the curriculum was field-tested in at least one class with an average of 25 students. Students, majoring in CS, where in either the first or second year (K9 or K10) of an Italian high school. The average female population was 15%. An average of 15% of students with disadvantaged socioeconomic status can be estimated. K9 students approached the course without mandatory prerequisites. For K10 students, a mandatory knowledge of basic problem-solving techniques and major programming constructs in an imperative language including procedures and functions were required. On average in each class, there were two students with learning disabilities (dyslexia or dysgraphia) and one student with special education needs. Curriculum effectiveness was qualitatively evaluated through student surveys and pre-test post-test assessment. When possible, comparisons with other classes in the same school taught by different professors were performed. The main conclusion that can be drawn from the evaluation process is that overall 14/16 years old students at the beginning of the course tend to underestimate blocks languages, considering them too simple, useful for younger people, not teenagers. As the progression of the topic becomes tougher and challenges the students, their appreciation of block languages increases since these languages allow the students to easily reason on the problems, construct artifacts and test them without worrying about too many details (Giordano & Maiorana, 2014).

Teacher feedback was obtained from five anonymous teacher reviews regarding the curriculum. The reviewers were located in Italy and the reviews were collected from mid 2017 to mid 2018. Other feedback was obtained from direct observations, informal unstructured teacher interviews inside a pre-service and professional teacher development course run in 2015. The teacher development course was attended by 40 teachers. Thanks to a Google CS4HS grant, the project run a teacher workshop

where by means of surveys, and meeting with teachers the author obtained feedback about learning resources, teachers' needs, and expectations, and features desired for a curriculum. Analysing the teachers' feedback, it is possible to summarize the following key ideas:

1) On first impression, the quality of the proposed material and the diversity of the materials seem to disorientate some of them. For this purpose, indications of different progressions and a teacher guide offer a way to get acquainted with the curriculum. This guide can be used just as an ice-breaker; the experience and teachers' knowledge of their students will allow them to navigate the curriculum and find the best activity suited for the next steps in the zone of "Proximal development" for each individual student.

2) The ample diversity of communication channels and expressive registers, tools and technologies coupled with clearly stated progression and levels of difficulties allows for an inclusive and equitable approach. This approach is strengthened by an attention to learners with special abilities (UNESCO, 2017) in content delivery (edX, 2019).

3) The teaching approach sustained by inquiry-based pedagogies (Hazelkorn E. , et al., 2015), Peer Instruction (Porter, et al., 2016), (Peer Instruction, 2019) and Process-Oriented Guided Inquiry learning (Education ambivalence, 2010), (Computer Science POGIL, s.d.) has the advantage of giving students an active role. By flipping the classroom (Bishop, Verleger, & others, 2013), (Karabulut-Ilgu, Jaramillo Cherrez, & Jahren, 2018) teacher-led and peer-led classroom time can be focused on problem-solving activities. Solving puzzles, engaging in projects (Blumenfeld, et al., 1991) and realizing artifacts to solve real world problems (Wolber, 2011), alone, in pairs and in groups allows learners to hone their collaboration and communication skills (Griffin & Care, 2014).

4) The interdisciplinary approach seems to be a promising way to expose students to computing, especially in school streams (e.g. classical studies) where computing is not a mandatory topic. In this case, where there is a lack of teachers with a specific certification in computing, approaching computing with applications in the teachers' and student's comfort zones represents a low floor entry point.

5) Use of formative assessment (Giordano D., et al., 2015), (Oates, Coe, Peyton Jones, Scratcherd, & Woodhead, 2016) supported by the above-mentioned pedagogies greatly supports students' activities and teachers' instructional process.

Undergraduate students with a major in the Humanities (Maiorana F., Computational Thinking and Humanities, 2018), most of them exposed

for the first time to computing, reported, after overcoming foreseeable difficulties, joy and fulfillment in developing real work applications related to their subject of study and future profession and appreciated the design methodologies, the block language (Patton, Tissenbaum, & Harunani, 2019) and the possibilities to create mobile apps and sites showcasing their project portfolio.

Conclusion and further work

This work has presented the content, assessment, pedagogies, technologies and equity of a curriculum suited for a first course in computing, e.g. K9-K10 students, pre and in-service teachers, and undergraduate students. The curriculum is enriched by video, animation, assessment questions, and a companion website. The curriculum has been evaluated and improved during a multiyear and multidisciplinary teaching experience in high schools, undergraduate courses and informal education. A synthesis of the feedback received from students, teachers and reviewer and main lessons learned has been reported.

As a further study, the author plans to fine-tune the curriculum evaluation and improve it by leveraging different inputs, e.g. an international teacher surveys (Falkner, 2019) publish it and fully deploy and publish the companion web site (Maiorana F., Compucogito, 2019). The curriculum will be enlarged by designing, developing, deploying and evaluating learning resources suitable for a second and successive computing course. These courses will leverage on multiple design tools and on the use of visual block languages, as design and scaffolding tools. These tools will be coupled with textual language to develop interdisciplinary projects and real-world applications of interest for domains different from computing.

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USING STRUCTURAL EQUATION MODELLING TO STUDY THE INFLUENCE OF PERCEIVED USEFULNESS AND PERCEIVED COMPATIBILITY ON STUDENTS' ATTITUDES TOWARDS USING IPAD

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ABSTRACT

In this research an attempt has been made to test the integration of constructs from the theoretical models, Technology Acceptance Model (TAM), Innovation Diffusion Theory, Social Cognitive Theory, and Expectation–Confirmation Model in the educational field. It particularly uses Structural Equation Modelling with various constructs to investigate students' acceptance of using IPAD as a technological tool in undergraduate math classes in a Middle Eastern University. The survey in this study contained 150 university students enrolled in various undergraduate math classes at a Middle Eastern private American University, pursuing different fields of study. The empirical results support the theoretical model, it shows the influence of user satisfaction, perceived usefulness and perceived compatibility on students' attitudes towards using IPAD. Students welcomed the adoption of IPAD as a part and tool of the learning process. Finding of this research along with the ongoing research should encourage educators to put more emphasis on using technology in the learning process of mathematics.

Keywords: TAM, User satisfaction, Math, IPAD, Educators.

Introduction

Integration of IPAD in teaching in schools and colleges has been popular in recent years. IPAD is one of the most advanced technologies in the market. It supports hundreds of thousands of applications, many of them related to education (King & Bass, 2013). According to Khaddage (2013), the touchpad technology use in the education market is dominated by IPAD. Although the pedagogical uses of IPAD is still not clear and the research on the use of the IPAD in education is very recent, many researchers claimed that the advantages of the IPAD overcome its disadvantages. However, the research findings in this area, in the postsecondary education are

very scarce which is the main reason for conducting this study. Many of these scarce results support the use of tablets in postsecondary education (Kayapinar et al., 2019 & Bluestein & Kim, 2017). According to Sachs and Bull (2012) using tablets increases motivation among students and encourages communication and collaboration among students and between teachers and students. Hutchison et al. (2012) reported that using tablets encourages the communication skills among classmates and between students and instructors. It was also reported that tablets have significant positive effect on students with learning problems (McClanahan et al. 2012). This paper aims to investigate the impact of IPAD use on students' attitudes towards using this type of technology in undergraduate math classes. It proposes and empirically tests the integration of constructs from the Theoretical models, Technology Acceptance Model (TAM), Innovation Diffusion Theory, Social Cognitive Theory, and Expectation–Confirmation Model to use IPAD in undergraduate math courses. It aims at investigating and assessing the factors that determine the adoption of technological tools in mathematics among university students. It is believed that the findings of this study will help decision makers in higher education institutions to gain a better understanding of the factors that determine student's adoption of these tools in classrooms and lead to a better implementation, investment, and benefit in the educational field.

Recently, various papers have been published on the context of application of TAM in higher education (Ifinedo, 2019; Zogheib et al., 2015; Teo, 2009, 2010, 2011a, 2011b). A number of studies have used TAM to examine learners' willingness to accept e-learning systems (Al-Adwan et al., 2013; Shah et al., 2013; Sharma and Chandel, 2013; Shroff et al., 2011; Tabak and Nguyen, 2013) or to predict learners' intentions to use an online learning community (Liu et al., 2010). Some papers focused on validating TAM on specific software which is applied in higher education. For example, Escobar-Rodriguez and Monge-Lozano (2012) use TAM for explaining or predicting university students' acceptance of Moodle platform, while Hsu et al. (2009) performed an empirical study to analyze the adoption of statistical software among online MBA students in Taiwan. While some studies report that perceived usefulness and perceived ease of use impact attitude toward technology use and behavioral intention to use technology (Rasimah et al., 2011; Teo, 2011; Sumak et al., 2011), Grandon et al. (2005) argued that e-learning self-efficacy was found to have indirect effect on students' intentions through perceived ease of use. Also, Mungania and Reio (2005) found a significant relationship between dispositional barriers and e-learning self-efficacy. They argued that educational practitioners should take into consideration the learners' dispositions and find ways through which e-learning self-efficacy could be improved. Sumak et al.

(2011) found that perceived usefulness and perceived ease of use were factors that directly affected students' attitude, and perceived usefulness was the strongest and most significant determinant of students' attitude toward using technology in learning, while Wu and Gao (2011) identified perceived enjoyment as a factor in predicting attitude and behavioral intentions to the use of clickers in student learning. Based on TAM, Wong et al. (2012) explored the role of gender and computer teaching efficacy as external variables in technology acceptance in Malaysia. The authors found that TAM was adequately explained by the data. The model accounted for 36.8 percent of the variance in intention to use computers among student teachers.

Theoretical Frame Work

Technology Acceptance Model (TAM)

Among the most popular models in technology acceptance research, the technology acceptance model (TAM) (Davis, 1989) has been found to be a robust and parsimonious model for understanding the factors that affect users' intention to use technology in education (Teo, 2012). In fact, TAM has become one of the most widely used models in technology embedded education research (Kılıç, 2014). What makes the TAM model widespread is its understandability and simplicity (King & He, 2006).

TAM was developed by Davis (1986) to theorize the usage behavior of computer technology. TAM was derived from another popular theory called Theory of Reasoned Action (TRA) from the field of social psychology which explains a person's behavior through their intentions. Intentions in turn are determined by two constructs: individual attitudes toward the behavior and social norms, or the belief that specific individuals or a specific group would approve or disprove of the behavior. While TRA was developed to explain general human behavior, TAM specifically explains the determinants of computer acceptance that are general and capable of explaining user behavior across a broad range of end-user computing technologies and the user population (Davis et al., 1989). TAM breaks down the TRA's attitude construct into two constructs: perceived usefulness (PU) and perceived ease of use (EU) to explain computer usage behavior. In fact, TAM specifically explains the determinants of information technology end user's behavior towards information technology (Saade' et al., 2007). In TAM, Davis (1989) proposes that the influence of external variables on intention is mediated by perceived ease of use (PEU) and perceived usefulness (PU). TAM also suggests that intention is directly related to actual usage behavior (Davis et al., 1989).

Innovation Diffusion Theory

Rogers (2003) defined compatibility as one of the characteristics of innovation. It studies how innovation is perceived as being consistent with the existing values, needs, and past experiences of potential adopters. Past research showed that compatibility demonstrated its pertinence to the discourse on user acceptance of technologies (Chen 2011). TAM was combined with innovation diffusion theory to explain and predict intention to use technologies Chen, et al (2002). Many studies found compatibility as an important factor that affects students' usage of learning technologies (Lai, et al 2012).

The Expectation–Confirmation model

Satisfaction and perceived usefulness are the major blocks that were defined in the Expectation–Confirmation Model (ECM) which was proposed by Bhattacherjee (2001). Satisfaction refers to the extent to which a user is pleased with using a technology for a particular purpose (Liao, et al 2015). Student satisfaction is an important indicator of the quality of learning experiences students received (Yukselturk & Yildirim, 2008). Hence, it is valuable to investigate students' satisfaction with different technology used in the learning and teaching process, as new technologies have altered the way in which students interact with instructors and classmates (Kaminski, et al 2009).

Perceived usefulness is defined as the extent to which a person believes that using a particular system will enhance his or her job performance, Davis (1989). Subramanian (1994) found that perceived usefulness had significant correlation with attitude toward usage behavior. This finding was later confirmed by Fu et al. (2006) and Norazah, et al. (2008) who found that behavioral intention was largely driven by perceived usefulness.

Social Cognitive Theory

Social Cognitive Theory (SCT) states that social and psychosocial factors influence user behavior. Self-efficacy is one of the factors that is considered in this study. It is perceived that is one's belief in his or her ability to execute a task or behavior (Bandura, 1986). Venkatesh and Davis (2000) found that self-efficacy acts as a determinant of perceived ease of use both before and after hands-on use with a system. Self-efficacy is considered as one of the external variables in the TAM model and it plays a vital role in shaping an individual's feeling and behaviour (Compeau & Higgings, 1995). Research on self-efficacy has been found to be a significant predictor of perceived usefulness and perceived ease of use (e.g., Hsu et al., 2009; Macharia & Pelser, 2014; Padilla-Melendez et al., 2008).

Research Model and Hypotheses Development

The research model of this study is presented in Figure 1. The following hypothesis are proposed based on the theoretical model:

H1: Attitude has a significant effect on students' behavioral intention to use IPAD,

H2: Perceived ease of use has a significant effect on students' attitude towards using IPAD,

H3: Perceived ease of use has a significant effect on the perceived usefulness of IPAD,

H4: Perceived compatibility has a significant effect on attitude towards using IPAD,

H5: Self efficacy has a significant effect on attitude towards using IPAD,

H6: Self efficacy has a significant effect on perceived usefulness towards using IPAD,

H7: Self efficacy has a significant effect on perceived ease of use towards using IPAD,

H8: User Satisfaction has a significant effect on perceived ease of use of IPAD,

H9: User satisfaction has a significant effect on perceived usefulness of using IPAD,

H10: Perceived usefulness has a significant effect on attitude towards using IPAD.
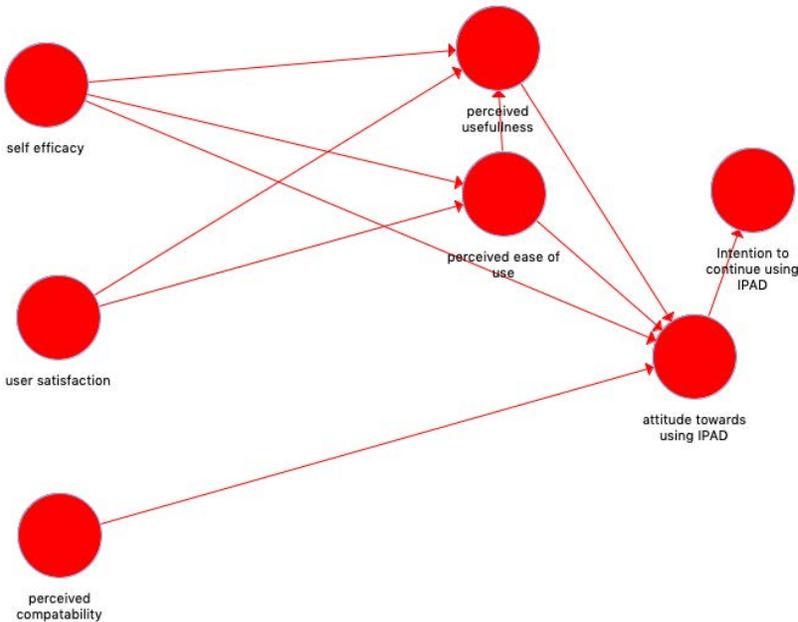
Figure 1. The PLS research model

Methodology

Study Context and Participants

The sample in this study consisted of 150 university students enrolled in undergraduate math classes at a Middle Eastern private American University. The students were enrolled in the academic years 2015–2016 through 2018–2019 in different classes (algebra, calculus, statistics, differential equations...), that were taught by the same instructor. The participants were admitted to the university based on their high school grade point average. Students were pursuing different fields of study, for example, graphic design, communication, business, computer science, engineering, and some were undecided. Many students used IPAD for taking notes and using different math applications.

Data were collected during the last week of classes to guarantee that students had obtained enough experience with the IPAD before they answer the questionnaire questions.

Measures

The instrument used in this study uses a modified version of the original technology acceptance model (TAM) that was created by Davis (1989). In this study, the combination of TAM and compatibility is used, and constructs were measured by indicators using a 7-point Likert-type scale. The compatibility indicators were "Using IPAD fit well with learning math," "Using IPAD fit well with helping me to be efficient in learning math," "Using IPAD is compatible with my learning math," and "Using IPAD has provided me with a good opportunity to learn math". The behavioral intention indicators were "I intend to check announcements from IPAD frequently," "I intend to be a heavy user of IPAD." The attitude constructs were "studying through IPAD was a good idea," "studying through IPAD was a wise idea," and "I am positive toward IPAD". The perceived usefulness indicators were "IPAD would improve my learning performance," and "IPAD could make it easier to study course content." The perceived ease of use indicators were "I find IPAD system easy to use," "Learning how to use IPAD is easy for me," and "It is easy to become skillful at using IPAD." The satisfaction indicators were "All things considered, I am very satisfied with IPAD," "Over all my interaction with IPAD is very satisfying." The self-efficacy indicators were "I feel confident finding information on Apple webpage," and "I have the necessary skills for using IPAD."

Data Analysis

The statistical software Smart-PLS 3.1 that implements the use of partial least square structural equation modelling (PLS-SEM) method was used

to conduct the statistical analysis in this study. (PLS-SEM) is a variance-based method used to estimate structural equation models. Other well-known softwares such as LISREL and AMOS are covariance based that use the maximum likelihood approach to estimate structural equation models. The advantage of using PLS-SEM lies in the fact that no assumption on the distribution of data is needed (Cassel, et al 1999). Moreover, a sample size that is 10 times the largest number of indicators is required. The large sample size of 150 students will increase the consistency of the model estimations. The indicators in the proposed model are all reflective because they are considered as effects of the latent variables (Bollen and Lennox, 1991).

Tables 1, 2, 3 & 4 provide the information on student gender, student age, student years of study and student marital status, respectively.

Table 1. Student gender

	Frequency	Percent
Male	62	41.3
Female	88	58.7
Total	150	100

Table 2. Student age

	Frequency	Percent
Less than 18	15	10
18–25	119	79.3
26–30	6	4
More than 30	10	6.7
Total	150	100

Table 3. Student years of study

	Frequency	Percent
one year	31	20.7
Two years	74	49.3
Three years	21	14
Four years	24	16
Total	150	100

Table 4. Student marital status

	Frequency	Percent
Single	116	77.3
Married	34	22.7
Total	150	100

In order to assess the measurement model, the composite reliability, convergent validity and discriminant validity should be evaluated (Barclay et al, 1995). The composite reliability estimates the reliability based on the inter correlations of the indicator variables of a specific construct. It is recommended that the value does not exceed 0.95. Otherwise, the indicators will be measuring same information (Nunally and Bernstein, 1994). Construct reliability for all constructs in the model ranged between 0.910 and 0.951 as shown in Table 5. Convergent validity measures the positive correlation between an indicator and the other indicators of a construct. It can be measured by using the average value extracted measure (AVE) that should exceed 0.5. Table 6 shows that all values in the model varied between 0.762 and 0.901. Discriminant validity measures the extent to which a latent variable is distinct from other variables. One way to assess discriminant validity is by using the Fornell-Larcker criterion (Fornell & Larcker, 1981). It requires that the square root of each construct's (AVE) be higher than all its correlation with the other constructs. Table 7 shows that all diagonal values (square root of AVE) are higher than those in their corresponding rows and columns.

The results of the hypothesis testing are shown in Table 8. Chin (1998) recommended that Bootstrapping of 500 subsamples is to be conducted to test the significant of the t test. Ten hypotheses were tested, a few hypotheses were significant at the 0.05 and 0.1 significance level while the majority were significant at the 0.000 significance level. Table 9 shows the path coefficients and the p-values.

Table 5. Composite Reliability

	Model
attitude (ATT)	0.932
behavioral intention (BI)	0.921
perceived ease of use (PE)	0.910
perceived usefulness (PU)	0.951
user satisfaction (US)	0.920
perceived compatibility (PC)	0.922
self-efficacy (SE)	0.943

Table 6. Average Value Extracted

	Model
attitude (ATT)	0.851
behavioral intention (BI)	0.824
perceived ease of use (PE)	0.831
perceived usefulness (PU)	0.901
user satisfaction (US)	0.762
perceived compatibility (PC)	0.891
self-efficacy (SE)	0.878

Table 7. Latent Variable Correlation

	ATT	BI	PE	PU	US	PC	SE
ATT	**0.922**						
BI	0.505	**0.908**					
PE	0.773	0.444	**0.912**				
PU	0.821	0.461	0.745	**0.949**			
US	0.674	0.588	0.646	0.671	**0.873**		
PC	0.801	0.712	0.567	0.652	0.832	**0.944**	
SE	0.563	0.489	0.832	0.674	0.782	0.882	**0.937**

Table 8. Hypotheses testing results

	Models' coefficients	P Values
H1: ATT -> BI	0.195	0.088
H2: PE -> ATT	0.147	0.086
H3: PE -> PU	0.323	0.012
H4: PC -> ATT	0.753	0.000
H5: SE -> ATT	0.231	0.077
H6: SE -> PU	0.301	0.013
H7: SE -> PE	0.521	0.000
H8: US -> PE	0.502	0.000
H9: US -> PU	0.535	0.000
H10: PU -> ATT	0.401	0.000

Discussion and Conclusion

This research investigated University students' acceptance of IPAD using the combination of TAM, Innovation Diffusion Theory, Social Cognitive Theory (SCT) and Expectation–Confirmation Model in the educational field. Results revealed that self-efficacy have a positive effect on students' perceived ease of use, perceived usefulness and attitude towards using IPAD. Perceived ease of use is defined as "*the degree to which a person believes that engaging in online transactions would be free of effort.*" For students, this means student's perceived ability to handle technological applications in their math classes. Perceived ease of use affects perceived usefulness and attitude, perceived ease of use affects attitude and attitude affects behavioral intention. The reported results are in line with what is found in literature and can be explained based on the motivational theory (Lee, et al 2005; Saade', et al 2007; Park, 2009). Although the composite reliability values for some of the constructs is close to 0.95, this is still considered acceptable. High values have been reported in the literature. For example (Yi & Hwang, 2003) reported values of 0.94 and 0.93 for the two constructs ease of use and enjoyment, respectively. Park (2009) reported a value of 0.93 and 0.94 for perceived ease of use and attitude, respectively. The reason for such high values could be that participants could not fully differentiate between the indicators of the considered construct. This issue could be solved in a future work by probably rephrasing the questions.

Finding of this research should encourage institutions to put more emphasis on implementing more technological tools in the learning process of mathematics. In general, the empirical results supported the model. Probably, students welcomed the adoption of IPAD as a part and tool of the learning process. Perceived usefulness as defined by Davis (1989) is the extent to which a person believes that using a particular system will enhance the job. The high effect of the perceived usefulness construct on attitude can be explained by students' interest in IPAD and viewing it as useful technological tool that might enhance their learning. It seems that students are motivated both intrinsically and extrinsically as they seem to value the role that technological tools will play either on the personal level or on the social level. It is not only beneficial to them as students, but it will also please others, such as parents and educators, to know that such tools had a big influence on their education. Last but not least, this research study examined the applicability of an extended version of TAM to explain students' acceptance of the IPAD as part of their enrolment in mathematics classes at university. The findings have great implications for educators and students all over the world as they shed light on the significant factors that

determine students' acceptance of technological tools or platforms used in the math classroom.

Despite the great findings of this study, it is essential to remember that it was limited to students in a private American university in the Middle East. It is recommended that same study be done at different institutions in the region, public and private, before any generalization can be made. It is recommended that this study be extended to demographic characteristics, for example, age, gender, location, etc… It would also be interesting to test a variety of technological tools other than IPAD.

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INTERACTIONS BETWEEN PARENTING STYLE IN THE FAMILY AND THE USE OF SMARTPHONES AND TABLETS OF 2–3 YEARS OLD CHILDREN

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ABSTRACT

The aim of the research is to identify the interactions between the parenting style in the family and the use of smartphones and tablets of 2–3 year-old children. Mixed-methods design was used for research including the use of such research methods as literature analysis, systematic literature review, questioning of parents about the parenting style, children's playing habits and usage of touchscreen devices (about 30 children 2–3 years old) and a case study (observation) about one child's usage of touchscreen devices and parenting styles. As the result of research we can conclude that children are skilful users of a smartphone and tablet when they use the device regularly, but parents do not have time to work with children, i.e. parents teach the child a skill to prevent the child from disturbing the parent. If a child has the opportunity to use a smart device on a regular basis, he or she becomes a skilled user at a level that allows a smartphone and tablet to meet their needs without the help of a parent. Parents have different views on the impact of the use of smartphones and tablets on child development (positive, negative, and unaffected). Parents whose views are dominated by the perception that the use is positive or has no effect allow children to play with the touchscreen device more often and for a longer period of time and do not impose consistent rules. The habits and skills of using smart devices for children do not have a significant relationship with the parenting style.

Keywords: Parenting styles, 2–3 year-old children, Smartphone, Tablet, Media usage habits.

Introduction

Technologies have rapidly entered our everyday life transforming the traditional ways of obtaining information, mutual communication and even the ways of children's playing. Ten years after the creation of internet the majority of adults living in the USA had at least once accessed

the internet (Pew Internet & American Life Project, 2000), but in 2012 already a third of the inhabitants of our planet had the access to the internet (Miniwatts Marketing Group, 2012). Since 2007 when the company Apple put iPhone in the market, mobile phones started to be used for a wide purpose and became the basis also for the development of tablets (McCarty, 2011). The research (Lynch & Redpath, 2014) states that iPad user-friendly design creates few technical problems therefore people quickly become enthusiastic and competent users. The number of applications available in Google Play Store (before that Android Market) has increased from 16 thousand in December 2009 to 2 million and 600 thousand in December 2016. More than 60% of them are free of charge (Statista, 2016a; Statista, 2016b). The number of downloaded applications has increased from one billion in August 2010 to 65 billion in May 2016 (Statista, 2016c).

Children show interest in new technologies, especially in touchscreen devices. The senior researcher of the Paediatric department of Cork University D. Murray states that 80% of parents have touchscreen devices and 9 of 10 parents allow their small children to use them. Approximately two thirds have downloaded applications for their children (Touch-Screen Technology Usage in Toddlers, 2016). Although the majority of parents allow their children to use the touchscreen technologies they are worried about the impact of technologies on the children's development. There is a wide-spread opinion among parents that the use of technologies is harmful for the child's physical and mental health as well as that it hinders the child's development. Due to these worries, a part of parents do not allow their child to use the touchscreen devices.

The study performed in 2010 (AVG, 2011) revealed that although the majority of 2–3 years old children cannot swim (only 15% can swim), tie the laces, prepare breakfast independently, ride the bicycle (43% can ride), they know how to turn on the computer, to use the mouse, can play computer games and use the parents' smart phones.

Although researches are carried out in the world about the impact of technologies on the children's development, their conclusions are ambiguous: there are researches that enthusiastically support new media (incl. Galloway, 2009) and such that indicate that technologies have no place in early teaching (e.g., House, 2012). Besides, it should be taken into account that digital technologies develop very fast and thus the possibilities, way and aim of using technologies also change.

The study performed in 2004 (Alliance for Childhood, 2004) connects the use of computers with the lack of creativity in later years, obesity and even higher risk of terrorism. The authors of this article paper question the credibility of these conclusions taking into consideration how recently the computers have become accessible and common. The study from 2005

(Miller, 2005) points out that the use of technologies should be decreased to the minimum to promote such aspects important to the child's development as playing outdoors, social interaction and cognitive interest. The study performed in 2009 (Johnson & Christie, 2009), in turn, reveals that digital technologies serve as an educational means and is suitable in early childhood to make the child's development faster. The authors of the study claim that worries about computers repelling children from traditional activities and communication with peers have no grounds. The software adequate for the development with open-ended content can promote playing, cooperation and creative solution of problems. The authors of the study indicate that children need balance between playing in the digital and real environment.

The fact to what extent the touch screen technologies are a part of young children's life and to what extent they should be is the dilemma of today's parenting (Cocozza, 2014), taking into consideration the accessibility and use of ever increasing touch screen technologies (George, 2014). The use of touch screen technologies is perceived as a threat to what has been accepted as a "normal" (Piaget, 1972) development. Parents are often worried that children could access inappropriate content (Byron, 2008). Thus, the research problem appears which emerges in the contradiction between the parents' and children's desires as well as contradictory studies about the impact of using digital media on the child's development. The aim of the research is to identify the interactions between the parenting style in the family and the use of smartphones and tablets of 2–3 year-old children.

Materials and Methods

The sistematic literature review applying the three phase model of Joanna Briggs Institute Reviewers Manual (2014) was chosen for the data collection and processing. EBSCOhost Web search platform was used for the research basis. Articles for the analysis were selected applying the inclusion criteria (any country, the article in English, 2–3 year-old children, touch screen devices, use of the smartphone, tablet) and exclusion criteria (technologies are used for children with special needs, literature survey). Based on the analysis of articles (Price, Jewitt & Crescenzi, 2015; Cristia & Seidl, 2015; Ahearne, Dilworth, Rollings, Livingstone & Murray, 2016; O'Connor & Fotakopoulou, 2016; Nevski & Siibak, 2016), a questionnaire was developed for parents.

The questionnaire was spread in social networks in April and May in 2016 as well as sent by e-mail toparents familiar to the research authors. 30 respondents filled in the questionnaire. 25 or 83% of respondents were mothers, the rest were fathers. The questionnaires have been filled in about

children who are 24 to 44 months old, 22 children of them are 2 years old but 8 children are already 3 years old. 19 or 63% are boys and 11 girls. 50% of children live in Riga, 30% in another city, 10% in the countryside and 10% do not live in Latvia, i.e., they are children of Latvians who have emigrated. None of the children have eyesight problems, one child has posture problems. Parents give information about 2 children who cannot be drawn away from the digital device.

The research had also limitations. Taking into consideration the way of spreading questionnaires it was possible to reach only those parents who have access to the internet and who use social networks. The lack of the second possible way of obtaining on-line data is the respondents' unreliability because it is possible that respondents gave socially acceptable answers (Paulhus & Vazire, 2007).

The on-line questionnaire consisted of five parts. The information about the child and the person filling in the questionnaire was obtained from the first part of the questionnaire. The second part consisted of 30 questions intended for finding out the parenting style, based on the theoretical understanding of parenting styles. The third part had 11 questions about the child's habits of using the tablet and smartphone. The fourth part allowed discovering the parents' rules and opinion about the use of tablets and smartphones by 2–3 years old children.

To describe more profoundly and to understand the use of a tablet and smartphone by 2–3 years old children, and the parents' role and to observe the introduction of the suggested recommendations and the child's actions with the touch screen devices as a result of introducing the recommendations, a case analysis was performed. The case study lasted for 6 months. A 35 months old child from the Latvian speaking family where both parents have higher education was chosen for the research. There is also an older daughter (14 years) and younger daughter (3 months) in the family. What the boy is able to do and willingly does with the tablet and the smartphone, what the parents' rules are and what their reaction to the child's actions is, is described at the beginning of the research. After that the observation of the child continued and the development of his skills and changes in his interests in the actions with the tablet and smartphone was fixed.

Results and Discussion

Description of the use of smartphones and tablets of 2–3 years old children

Sometimes reading mass media, internet blogs and participating in discussions about today's children and parenting problems there emerges an impression that nowadays children choose only to play with smart devices; however, the study results show that playing with the smartphone tablet occupies only the 6th place (mean = 4.93) concerning the popularity among seven types of playing. Children most willingly choose the activities in the playground, such as swinging, sliding, playing in the sand-box (mean = 2.30). The second place is taken by playing with traditional toys, e.g., dolls, cars, building blocks, and different sports activities, e.g., running, skate-boarding, ball games take the third place. This disproves the widely spread myth that the most popular way of playing for a modern child is playing with digital devices – if the child is offered a possibility to engage in traditional plays, he/she most willingly chooses them.

It can be claimed that this is a myth that today's children mainly play with digital devices and they cannot be separated from them. Thus, parents can be recommended to offer diverse possibilities of plays to their children balancing modern toys – tablets and smartphones – with traditional activities because children gladly choose such plays. If parents offer other exciting activities, then the child will not develop dependency from the virtual reality.

Playing with the tablet and smartphone is more popular among girls than boys (the mean 4.45 and 5.21, respectively). Playing with the tablet and smartphone is slightly more popular among three years old children than among 2 years old. 40% of children have started playing with a touch screen device at the age of 2, and 30% already being one year old. 16.7 % do not play with the sartphone or a tablet. One tenth has started playing with them already before turning one year old, and one child has started at the age of 3. 23% of children have never played with a smartphone and 11% have never played with a tablet.

The majority of children use the smart device less than once a week. However, 8 children or 32% use the device almost every day (16% use the smartphone every day). Approximately a third of children use the smart device less than 20 minutes a day but there are also children who are allowed to use it 1 – 2 hours a day.

When playing with the smartphone or a tablet, the majority of children watch cartoons. When playing with the smartphone, 28% of children play games, listen to music, 72% watch cartoons, e.g. YouTube, 88% look at photos, 32% communicate with close people, e.g., via Skype,

56% take photos, 16% do other things, e.g., watch videos from folders, adjust the sound volume, keep in hands while talking with the granny on the phone, click all the symbols, try to unlock, speak with grandparents when the phone is put to the child's ear, look at the calendar or Instagram. A statistically significant medium close negative correlation (n = -0.405) was observed between the child's age and watching cartoons on the smartphone, which means, that the older the child the less he uses the smartphone for watching cartoons.

When playing with the tablet, 36% of children play games, 68% watch cartoons, 16% listen to music, 10% look at photos, 20% communicate with close people, 32% take photos, 20% do other things, e.g., draw (3 children) and simply touch it because they yet cannot handle the tablet. A statistically significant medium close correlation was observed between the child's age and the use of the tablet in order to look at the photos, which means that the older the child gets the more he looks at the photos.

Children are rather skillful users of smartphones and tablets at the researched age (see Fig. 1). For example, 11 children independently start the selected game or application and 9 children choose the cartoon that interests them or another content on YouTube. It can be concluded that children have mastered fairly well simple actions that, regardless the content, are always performed in the same way, e.g., unlocking the device, adjusting the volume. Selecting the game parameters, e.g., the level of the game, heroes, etc., causes problems. This can be explained by the fact that each game has it in a different place and different game parameters are offered.
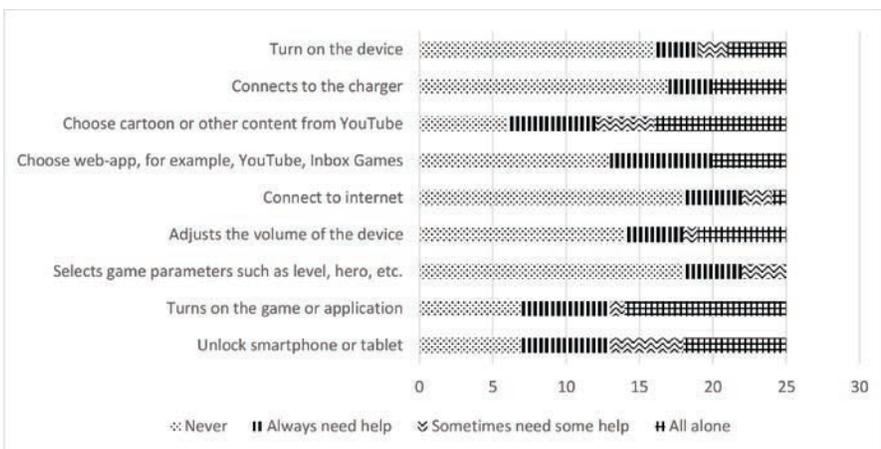
Figure 1. Skills of using the smartphone and tablet of 2–3 years old children

Parents' rules and action in regarding the 2–3 years old children's playing with the smartphone and the tablet

Parents indicate that the majority of children (64%) seldom have the smart device at their disposal but almost a quarter use it frequently. Comparing with the above analysed data about the children's use of tablets it can be concluded that rarely according to parents' view means 2–3 times a week or less.

The convincing majority of parents (80%) often determine when and how much the child can play with the smartphone or tablet; yet 6 parents never do it or do it rarely. Three of the surveyed parents never state what exactly the child can do with the smartphone or tablet, e.g. which games he can play; hower, the greatest part (77%) often do it.

Statistically significant close correlations (n = 0.769) were identified between how frequently parents determine what the child can or cannot do with the smart device and how long the child can play with the device. Parents who often determine what the child can do also often deterine how long the child can play with it.

These answers, similar to the study performed in 2016 in the United Kingdom (O'Connor & Fotakopoulou, 2016), indicate that the opinion about the 'innocent child' dominates among the respondents when parents perceive children as unprotected beings who need the instructions and protection of the omniscient adult.

Although the majority of parents never use the permission to play with the smart device as an award for good work, ten parents or one third do it. Eleven parents use the smart device for punishing forbidding the child to play with it if he had been naughty. Thus, according to behaviourism theories, the possibility to play with the smart device is used both as a positive and negative reinforcement. However, parents should be careful and assess the context for the child's naughtiness so that in case of punishment the child's need for attention is not being satisfied because then unintentionally this naughtiness is being reinforced.

A statistically significant weak correlation (n = 0.379) was observed between using the smartphone as an award and how often the parent determines what the child can do with the smart device – the more often it is determined the more frequently it is used as an award.

The majority or 73% of parents never change the rules and do not allow the child to play with the smartphone or tablet if the child whines or pleads but almost one fourth, although seldom, still change their rules and allow playing. Thus, the child according to the social learning theory acquire the manipulation skills and will apply them also later, e.g. when they will not want to overcome some difficulties in learning.

37% of parents admit that their rules about the use of the smartphone or tablet are seldom or never consistent and they are not explained to the child. Unclear borders for the child's behaviour and demands set to the child, including the use of smart devices, can promote the development of such behaviour that parents find undesirable, e.g. whining and pleading for the change of rules, manipulative actions.

Statistically significant weak correlations (n = 0.397) were observed between how often the parents' rules are consistent and how often the parent determines the duration of using the smart device – the more frequently the parent's rules are consistent and explained to the child, the more frequently the parent alo determines the duration of using the smart device.

Only 10% of parents have no rules and the child can play with the smartphone or tablet as he wishes and when he wishes. This can be an evidence that parents trust the child's choice and decisions or that parents are neglectful or that parents are convinced that the use of smart devices cannot harm the child.

A statistically significant medium close correlation (n = 0.571) was observed between how often parents have no rules for using the smart devices and how often children have access to smart devices – the more frequently the parents have no special rules and the child can play with the smart device as he wishes and when he wishes the more frequently the child has access to smart devices.

Statistically significant weak correlations (n = 0.371) were observed between how often parents have no rules for using smart devices and how often the parent determines what the child can do with the device – the more frequently there are no rules the more frequently the parent determines what to do. This could mean that parents according to their mood or other factors determine what the child can or cannot do during the particular time of using the smartphone or tablet. This can create confusion in children and the desire to manipulate. If clear borders and rules are not set during this age, the child might be unable to see the connection between the action and consequences and he does not develop clear and consistent habits of using devices.

Almost half of parents consider that the maximum permissibe time a day how long the child can use the smartphone or tablet is 20 minutes. One fifth of parents consider that children aged 2–3 should not use smart devices at all, and 7% of parents consider that the maximum time could be 2 hours.

Two thirds of parents use the smartphone or tablet as a nanny's substitute so that the child could give them some peace and they could rest or do some urgent chores, 13% of parents often do it. Such encouragement

to play with smart devices can also promote the formation of the computer dependency.

Statistically significant medium close correlations (n = 0.465) were observed between how often the smart device is used as the nanny's substitute and how often the child has access to smart devices– the more they are used as the nanny's substitute the more accessible they are.

Assessing the impact of using the smartphone or tablet on the development of 2–3 years old children, two fifth of the surveyed parents consider that it positively affects the child's development, two fifths consider that it has a negative influence and one fifth think that it does not affect the child's development.

Statistically significant weak correlations were observed between the parents' views about the impact of using smart devices on the children's development and how often the smart devices are available (n = 0.380), as well as how often the parents' rules ar consistent and explained to the child (n = 0.367). Children, whose parents consider that the use of smartphones and tablets at the age of 2–3 does not affect the child's development, have access to smart devices more frequently. Rules are rarely consistent and explained to children, whose parents consider that the use of smart devices affect positively the child's development.

Thus, it can be concluded that parents' understanding of the benefits and threats of using smartphones and tablets by 2–3 years old children largely determine the parents' attitude to this way of playing. Parents who have a dominant positive view (mainly the benefits or do not see the impact on development) do not set special rules about the way or duration of using the devices. In turn, parents who have a dominant negative view (more threats to the child's development) have more rules, prohibitions and restrictions.

Interrelations between parenting styles in the family and children's use of smartphones and tablets

The parenting style in the family was determined to the surveyed parents. Authoritative style was identified for 26.7% of parents, authoritarian style for 26.7% and permissive parenting style for 46.7% of parents.

No statistically significant connections were identified in the sudy between the parents' parenting style and the child's age in which he starts playing with the smart device, how often and how long he plays with the smart device and games the child chooses to play.

A statistically significant medium close negative correlation (n = -0.440) was observed between the parenting style and watching cartoons in the smartphone. Parents of the authoritative style allow watching cartoons

more frequently than parents of the authoritarian style, and they more often than parents of the permissive parenting style.

A statistically significant medium close negative correlation (n = -0.424) was observed between the parents' parenting style and the child's skill to connect the device to the charger. Children whose parents have a permissive parenting style can do it worse than children who have authoritarian or authoritative parenting style in the family.

A statistically significant medium close negative correlation (n = -0.410) was stated between the parents' parenting style and the fact whether the parent's rules about using the smart device were consistent and explained to the child. Parents of the authoritative parenting style more often have consistent rules and explain them than parents of authoritarian or permissive parenting style.

Thus, it can be concluded that although there are observed some connections between the parents' parenting style and the habits of using smartphones and tablets by 2–3 years old children it cannot be claimed that the parenting style is the decisive factor in the formation of these habits and skills. It is rather the parents' understanding about the benefits and risks related to the use of smartphones and tablets. As only one parent of child filled the questionnaire, the author can not reject the parenting style as an insignificant factor because it is not known if the parenting style of both parents is the same and how the parents share the responsibility of bringing up children in the family regarding the rules and control over the use of tablets and smartphones.

Results of the case study

At the start of the case study it has been found that the observed boy very early (before becoming a year old) has had great interest in the computer, smartphone and tablet. Parents have to hide these devices because he wants to use them, e.g., touch the keybord of the computer, and talk on the phone. Until 15 months of age he has been shown games, i.e., the child watches how the father or older sister plays computer games and rejoice at what they see on the screen. Such activities are performed at week-ends to shorten the time, going to the countryside as well as in the evenings of week days. Having reached the age of 1 year and 3 months the child is able to coordinate the hand and finger movements and to play independently such games as My Talking Ginger, Ant Smasher; parents just have to turn on these games. The child really wants to play the tablet, he has noticed where it is kept and tries to get to it in different ways. Having got the tablet, he does not want to give it back, cries and resists. If parents do not limit the playing, he can keep playing for several hours without

a break and laugh loudly and rejoice at what happens on the screen talking with the images of the applications, getting angry if something goes wrong. Parents have suspicion that the child has developed dependency and they refuse to give the tablet, also the older daughter and father do not play games if the boy is present. The child whines for the first week and asks for the tablet occasionally but parents do not give it. After two weeks the boy does no longer ask for the tablet and chooses himself other ways of playing and creative activities.

At the beginning of the case study (aged 37 months) the child again has increased interest in touch screen devices and he spends many hours playing with them. Parents explain that during the last months of pregnancy and then continuing to work actively and participating in social events the mother offered the smartphone as a toy to the boy thus getting time for rest or work. As the child is often ill and stays at home the mother cannot do all the intended works, therefore she gives the smartphone every day. Starting the study, the child is able to perform the following actions with the smartphone and the tablet:

- talk with the grandparents on the phone. He can stop the call pushing the red button on the screen,
- willingly and with interest he chooses and uses game applications in the tablet (he himself chooses and presses the icon of the respective game on the screen). His favourite games are My Talking Ginger, My Talking Tom, My Talking Angela, Dumb Ways to Die, Magic Piano. The main hero "talks" with the player in the first three games as well as it is possible to interact with the imge, e.g., to feed, to tickle, to brush the teeth, to wash, etc. The child especially likes to poke the image until it falls Iimitates violence) – stars that rotate around the hero's head and the changes of facial expressions cause genuine joy and laughter,
- watches cartoons and puppit films on YouTube, using the smartphone, tablet or PC. Parents have to open the internet page and find the film following the child's instructions. After watching the film in the touch screen devices, he himself chooses the next film or asks parents to find the next film in the computer. The favourite themes are cartoons and puppet films about trains (e.g., Thomas Train), films with children's songs in English (e.g., Wheels on the Bus) as well as educational films which teach colours, forms and construction of vehicles from parts,
- uses drawing programmes in the tablet. He draws with a finger, dragging lines, and chooses the function to colour larger squares and chooses completed drawings, pictograms that could be added to his work.

The child spends 2–3 hours a day playing with touch screen devices and the PC.

Nine days after the start of the case study, the small sister arrives in the family. Mother, in order to feed the baby without hindrance, eat herself, cook dinner for the family or do other house chores, gives the boy the smartphone several times a day to watch cartoons and puppet films. Parents have accepted this kind of playing because then there is silence at home, i.e., the sleep of the little sister is not disturbed, and at the same time the boy has the possibility to be together with the mother and little sister (see a typical situation in Pict. 3.5.2). The time the child spends playing with touch screen device increases and now are 3–4 hours a day, 1–2 hours at a go. After three months the child already spends 3–6 hours playing with digital devices, watching something from 1 to 3 hours without a break at one time. The child carries the smartphone with him and watches it in any place. A small difference in the amount of using the smartphone is observed when the child is together with his father. Father is less compliant to child's demands to give him the smartphone therefore then the child uses the phone a bit less frequently.

Mother notices that the child has enlarged pupils of the eyes that do not change for a long time – only next morning they have decreased to the normal size but after 2 hours on the smartphone they gave enlarged again.

Half a year after the start of the case study the child chooses and performs the following actions which he could not do at the beginning of the case study:

- selects the YouTube icon and turns on the application,
- is able to find cartoons or puppet films of his interest,
- is able to adjust the volume of the smartphone,
- is able to connect to the charger when the notice appears on the screen that the battery is almost empty,
- uses the touch screen board in the PC using it to perform the mouse functions,
- watches cartoons and puppet films from the same theme group as at the beginning of the case study, also sings along and playing alone with toys uses phrases from the films, sometimes using words in English in his speech because does not know them in Latvian,
- plays the logic game Flow (has to connect dots of the same colour so that connecting lines do not cross),
- plays the construction game Bad Piggies (has to make the vehicle from different parts that could drive along the route) but does not perform a purposeful construction – only places together the parts and laughs loudly when the vehicle crashes,

- opens the photo and video albums in the smartphone and watches them, turns them with a finger by himself,
- takes photos with the smartphone. Usually takes 10–15 pictures of the same object at a go.

Conclusions

The use of smartphones and tablets becomes more and more widespread among 2–3 years old children therefore parents have to be aware of the risks and benefits assessing whether and how much to allow the child to play with the touch screen device. The parenting style can influence the use of the smartphones and tablets by 2–3 years old children but this is not the only factor influencing the use. The children's habits and skills of using smart devices have no essential connection with the parenting style; however, a trend is observed. Parents' views on the benefits and risks of using touch screen devices have a decisive role therefore it is necessary to inform and educate parents more about these issues. Parents who have a dominant view that the use of smartphones and tablets has a positive impact or no impact allow children more often and for a longer time to play with the touch screen device and do not set consistent rules.

Children are skilful users of smartphones and tablets if they use these devices regularly but prents have no time to play together with children, i.e., parents teach the child the skill so that he does not disturb them. If a 2–3 years old child has a possibility to use the smart device regularly he comes a skilful user on such a level that he could use the smartphone and tablet without the parents' help to satisfy his needs (to connect to the charger, to adjust the volume, to select the application, to choose a cartoon). Parents have to balance the time allotted to the use of touch screen devices with other activities, e.g., sports activities in the playground, playing with the toys, reading the books, creative activities, lively communication with parents and other people allowing to use the smartphone and tablet not longer than an hour a day thus decreasing the risk of developing the dependency and ensuring a diverse experience for the child's development.

The generation of children who has grown up with the smart device as a natural part of everyday life and a toy will soon start attending the school. Further studies will show the impact of the use of smart devices in early age on the child's abilities to learn.

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FOCUS ON CURRICULUM TRANSFORMATION THROUGH EDUCATOR AND STUDENT ATTITUDE DEVELOPMENT TO DIGITAL COMPETENCE

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ABSTRACT

Huge quantities of information processed through the use of digital technologies occupy an increasing place in education and trigger a search for understanding of the essence of speedy changes in order to capture the most productive ways of monitoring them. Investigations indicate that the goals of education in general which dominated at the beginning of the 21st century have shifted from an accent on disciplinary knowledge of facts to an in-depth understanding of scientific ideas and concepts and to higher order thinking of educators and students which are integrated with the transformational impact of technologies. Curricula offer students innovative knowledge and tools for deeper understanding and implementing digital technologies, as well as emphasize the development of creativity (Chai, & Kong, 2017). Meanwhile, the educators' attitudes to technologies that have become decisive educational tools differ across countries, cultural settings and universities. Even more, educators and students identify differences in their attitudes towards the digital technologies and their usage. Much of the students' possible success in digital competence development depends on the educators' attitude to the evolving amount of technologies to achieve a deep understanding of its transforming nature and appropriate changes of curricula. An effective usage of technologies for educational purposes, therefore, needs constant investigation to balance out all that constitutes the inseparable parts of education at its tertiary stage and thus keep targeted the transformational process.

The present paper uses the data collected by the project „*Implementation of Transformative Digital Learning in Doctoral Program of Pedagogical Science in Latvia*" (LZP-2018/2-0180) to trace if there are any significant differences in educators' and tertiary students' attitudes to digital technologies (Gokhale et al., 2013; Hofstede et al., 2011) and competence development, that might interfere with the transforming nature of technologies and the improvement of the digital competence of students.

The paper presents for discussion the possible developments of the didactic principles that form a background for creating a model of educators' attitude development in further learning. These can be grouped around the three quality levels of the digital competence, that highlight their essence and transformative character: (a) instrumental competence as an ability of completing one's job, (b) mastery level of one's competence and (c) educators' expert's level or even excellence in creative innovations that promote the development of a tertiary institution or tertiary education in general. The foundations of educator attitudes to digital technologies and their usage are discussed, as well as the transformational and transformative character of digital technologies that interfere with educator attitudes, general and unique qualities which a tertiary curriculum aims to nurture and that educator further learning helps to keep balanced.

Data analysis and the associated theoretical assumptions present a theoretical and methodological background for further investigation by the above – mentioned projects.

Keywords: educators, digital competence, attitude, gender and age differences, curricula transformation.

Introduction

Despite the growth of technology in universities, findings of investigations (Al-Musawi et al., 2013) conclude that universities have been slow to bring e-learning into the mainstream and maximize the benefits of digital learning for students. Usually, investigations are directed at the students' digital competence and state that some of them still hold underdeveloped e-learning skills. The educators' attitude towards e-teaching and e-learning also attracts the researchers' attention and need to be considered to catch up with vast quantities of information which is suggested and processed through digital technologies. These occupy a growing place in education and trigger the search for understanding of the most productive ways for their monitoring. We mention only some essentials to introduce this study:

(a) Investigations indicate that the goals of education in general, and of computer sciences in particular, which dominated at the beginning of the 21st century have shifted from the accent on disciplinary knowledge of facts to in-depth understanding of scientific ideas, concepts and high order thinking of educators and students that are integrated with the transformational impact of technologies.

(b) University curricula provide students with innovative knowledge and tools for deeper understanding and implementing digital technologies, as well as emphasize the development of creativity (Chai, & Kong, 2017), but the speedy progress of digital technologies, for instance, the 5G network (Segan, 2018; Hoffman, 2019) cannot be caught up to by the slow development of educator digital competence, especially if competence is defined in stale categories and restricted by their attitudinal development in general.

(c) Meanwhile, the educators' and students' attitudes to technologies as educational tools differ even within one university; educators and students identify differences in their attitudes towards digital technologies and their usage.

Much of the students' possible success in digital competence development depends on the educators' attitude to the evolving speed and amount of technologies, as well as changes to the study content and productive usage of the available equipment to achieve a deep understanding of its transforming nature and appropriate changes of the educational process. Therefore an effective usage of technologies for educational purposes needs constant investigation to keep in balance all that constitutes the inseparable parts of education at its tertiary stage.

The aim of the research: to analyze commonalities and possible differences in the assessment of students' and educators' attitudes towards digital technologies, reasons for their usage, and, if possible, identify motivation to improve their digital competence in order to embrace possibilities of curricula transformations. The researchers did not aim for a large number of respondents – it is more important to identify precedents and learn about the character of students' and learners' attitudes if these provide opportunities to reach the appropriate level of competencies.

Analysis of the collected empirical data and associated theoretical assumptions present a theoretical and methodological background for further investigation by the project that is mentioned above.

The background knowledge

The researchers employ the definition which conceptualizes attitude as a psychological construct, a force or quality of mind, a mental and emotional entity that inheres in or characterizes a person (Perloff, 2016). According to Allport (1935), the importance of educators' and students' attitude sits in the specific nature and functioning of attitudes. Several qualities and aspects of attitudes – intercultural, creative, critical, autonomous, responsible (Ala-Mutka, 2011; Martin & Grudziecki, 2015; Redecker, 2018) conform with studies in the digital age and therefore are of special importance in curricula building:

- numerous investigators confirm many aspects including a mental association between an object of the attitude formed and its evaluation (Fazio, 1989, 155), the favor or disfavor expressed by evaluating the object of the attitude;
- being related to motivation or a state of readiness for activities, attitudes influence thoughts, feelings and actions, therefore are linked to a person's core values;

- attitudes are never directly observable, but being real and substantial ingredients in human nature, they become impossible to account satisfactorily either for the consistency of an individual's behavior or for the stability of any social or cultural context;
- attitudes appear in actions, communication, and cooperation when learning by doing is an appropriate situation to demonstrate, share and further develop ones' attitudes;
- in the mobile world with speedy technological progress, attitude as a human construct responds to the external changes through its accessibility – attitude is learned, comes quickly to one's mind and influences decision-making.

Due to these qualities, attitudes deserve to be investigated to address and develop educator and student responsibility, the quick targeted reaction to constant external changes, and for triggering curricula development. These peculiarities allow the researchers to treat educators' and students' attitudes as an influential force which, if coupled with the transformational character of the digital technologies, should be used for targeted curricula re-direction towards effective tertiary studies appropriate for 21st Century creative autonomous learning and competencies.

Several interrelated phenomena and categories often appear in documents and research that need to be acknowledged and used in education. These are digital competencies, 21st Century learning, appropriate curriculum transformations, and accordingly updated understanding of pedagogy, especially its constant and changable components (Žogla, 2017). The new educational possibilities of the digital age challenge educators' attitude development through encounter with new knowledge, identifying its importance, ways and targeted activities of introducing appropriate transformative innovations adequate to the students' needs.

Digital competence should be considered transversal and therefore need to be defined and treated appropriately to create tertiary and educators' further learning curricula with a respect towards the role of competencies in attitude development and the power of attitudes to inspire competence development. Competencies are directly linked to student and educator success and their positive attitude to teaching and learning. Clear definitions (of attitudes and competencies) are needed on which to base investigations and education, to search for technology-based interactive devices and for systems to support learning even at the tertiary level, which combines real and digital worlds (Sanabria & Arámburo-Lizárraga, 2016) regarding innovative services for human-computer interaction (Lytras et al., 2016). Competencies are usually defined as a system of knowledge and skills being implemented in activities or a system of professional and pedagogical competence leading to a quality of a transversal competence and facilitating

learners' digital competence. It is most important that the focus is not on the technical skills and instrumental competence, rather, the framework aims to specify how digital technologies can be used to enhance and innovate education (EC, 2019). The transformative impact, speed, and scope of digitalization challenges educators' and students' motivation and attitude to technologies, developing the educational process, and appropriate achievements.

Under the auspices of the Joint Research Centre, Institute for Prospective Technological Studies of the European Commission, digital competencies are conceptualized as a broadly defined phenomenon that reflects one' confidence, critical and creative use of information and communication technologies to achieve goals related to work, employability, learning, leisure, inclusion and/or participation in society (Ala-Mutka, 2011).

For educational purposes and curricula transformations this general understanding of the digital competence structure challenges the detailed description of its components which must differ according to education, learner occupation, age and many other criteria, among which there are transformations brought about by the constantly developing digital technologies.

A conceptual model of digital competencies by Martin & Grudziecki (2015) provides some details of aspects of attitude (even if the authors do not distinguish between the aspects of content and character of cognition). These are the: intercultural, critical, creative, autonomous, responsible aspects. Attitudes include and demonstrate also the quality and content of its holder's thinking and self-conducted learning that allows for distinguishing between levels of digital literacy. These are digital competence (skills, concepts, approaches, attitudes, etc.), digital mastery usage (professional/ discipline application), and digital transformation (innovation, creativity). The model has prompted a need to address the pedagogical category of didactic principles, since a university process still functions on the basis of educator and learner value exchange within a background of targeted communication and cooperation. Educators operate with the study content in its capacity as a pedagogical tool but students operate with the content in its capacity as a transformable object of their activities, as well as with digital technologies that allow for their transformational usage and even initiate transformations. The essence of the educators' mission has not changed under the influence of the possibilities and the strong impact of digital technologies to enable students' self-directed learning. These make educators change the character of their assistance; and this can be achieved by educator attitude change to digital tools, educational process with digital tools and transformations brought about by digital tools.

Another consideration is published by UNESCO (2014). This distinguishes between three broad categories of skills by addressing skill dynamics – foundation/basic, specialized, and transversal skills – which are considered important for the development of well-rounded learners and are related to attitude dynamics and competencies accordingly. This also initiates considerable transformations of curricula to provide learners opportunities for critical and innovative thinking, development of interpersonal and organizational skills, intra-personal skills (e.g. self-discipline, enthusiasm, perseverance, self-motivation, etc.), global citizenship (e.g. tolerance, openness, respect for diversity, intercultural understanding, etc.), media and information literacy such as the ability to locate and access information, as well as to analyse and evaluate media content in addition or even instead of text-books and curricula.

A conceptual model of the digital competence that transforms tertiary curricula therefore includes:

a) instrumental skills and knowledge – operational and medium-related – important knowledge and understanding of the digital devices, their possibilities and skills of their usage in general and in educational settings in particular;

b) advanced knowledge and skills of digital tools, media application and usage outside the educational settings, strategic personal objectives in communication and collaboration, information management, further learning and problem-solving, meaningful participation, etc., in other words – usage of the digital tools in various situations where personalized values, critical thinking and creativity are challenged and added, and therefore demonstrate and further develop student and educator attitudes in communication, collaboration or cooperation;

c) attitudes as a component of an educator and student digital competence when operating with the digital tools demonstrate and further develop their quality of mind– creative, critical, autonomous, responsible, also demonstrate an attitude holder's social position, for instance, tolerance, intercultural relations, reciprocity etc.; responsible attitude should be among the didactic principles of tertiary education.

21st Century learning is closely related to digital technology and, accordingly, to the learner's and educators' digital competence. If properly designed and used technologies may enable student engagement in multisensory learning, successful performance, learning motivation and positive attitude. Students can interact with virtual objects at their own pace and make subjective sense of the perceived objective reality. Educators' choice of when and how to use technologies can be tailored to

learners' characteristics and needs, therefore easily capturing their attention (Pantelidis, 2009). The virtual world becomes an excellent opportunity for educators to implement a learner-centered pedagogical approach where students learn by doing, which otherwise would be limited. Furthermore, another way to enhance students' fine visual-spatial skills is the possibility of modifying parameters that often cannot be changed in a real system (Potkonjak, et al. 2016). These, and also other useful qualities, are encountered if educators and students hold a positive or responsible attitude to progressive changes.

These conclusions and statements (among many others) of researchers have been applied in education as creative tools for enhancing traditional curricula and learning techniques to change the role of the learner by becoming a transformer of his knowledge rather than just a receiver of information (Sanabria & Arámburo-Lizárraga, 2016), as well as a transformer of the ways of tertiary teaching-learning can enable changing roles among educators and students or teachers and learners. Effective and successful use of technologies coupled with the qualities of the 21st Century learning, attitude, and learning style personalize the virtual learning environments (Jena, 2016). These statements justify a tertiary didactic principle of learning in educator – student teams.

Curricula transformations are also a result of innovations encountered by educators and students and triggered by their attitudes. These further transform attitudes and lead to an appropriate environment for digital learning – virtual, face-to-face or mixed curriculum. Some of the advantages of virtual curriculum over the physical one include flexibility involving different components that can be easily created allowing damage and multiple access by students using the same virtual equipment at the same time. The virtual reality, for instance, aided by the 5G network (the fifth-generation cellular network technology that provides broadband access) is considered to be able of providing an even more effective way of teaching by ensuring access to a new generation of technology that improves the efficiency of teaching infrastructure (Orlosky, et al., 2017); the 3D virtual environments can facilitate students' constructivist learning by providing flexible and unique learner-centered learning. Practitioners can also observe differences in educator and student attitude demonstrations like readiness, desire and willingness to transform the educational process or curriculum accordingly. In addition to these explorations, the educational process must address also such complicated phenomena as individual features of personality and self-image, cognitive ability and peculiarities of perception, experience and understanding – all these and other factors influence attitude to technologies that affect educator, as well as student, learning and competence development. The researchers of the above

mentioned project consider relevant for tertiary education the principle of role exchange among educators and students to make better use of their priorities, especially the students' attitude and competence in the usage of digital technologies.

The term principles is a didactic category that introduces the basic theoretical statements and guidelines of creating and conducting an educator assisted tertiary process/curriculum. These become especially helpful to maintain the effectivity of a deliberately organized educational process in its intensive transformation. Therefore didactic principles accentuate learners' consciousness and activity in quality perception and competence acquisition, accessibility of education to meet students' needs and personalized educator assistance, facilitating student autonomous digital learning to make it transformative, etc. (more on didactic principles in the context of the technology-enhnced learning, Žogla, 2019). Principles of tertiary curriculum follow the logic of teaching-learning, as well as the logic of attitude development:

a) educators assist students' learning and saving time, successfully cover the program and their becoming self-directed learners by targeted usage of digital technologies;

b) multiple changes which are introduced by digital technologies invite educators to address their attitude to the changed mission, using the new possibilities and becoming digital learners themselves – individuals do not have an attitude until they first encounter the attitude object or information about it and respond evaluatively (Eagly & Chaiken, 1998).

Evaluation of educators' and students' attitudes towards digital technologies might prompt some ideas of transforming tertiary curricula towards more effective usage of e-environment by defining some didactic principles.

Methodology

The present paper uses the empirical data to trace if there are any significant differences in educators' and tertiary students' attitude to digital technologies (Gokhale et.al, 2013; Hofstede et.al, 2011; Sharma, 2009) and digital competence development, that might interfere with the transforming nature of technologies and therefore improvement of students' digital learning. The investigation used a questionnaire as a tool of data collection (Gokhale et.al, 2013). The survey has been posted on the project website and tertiary students and educators of Latvia were addressed to give their views. The questionnaire addresses five positions which demonstrate educators' attitude to the digital technologies:

-   educators' and students' interest in learning about IT,
-   recognition of the practical value of IT,
-   observations of the possible negative impact of IT,
-   gender equity or in-equity in using technologies,
-   recognition of the positive impact of technologies on work and human life.

The research base is made up of 260 respondents: 205 students and 55 educators of Latvian higher education institutions, including 44 men and 213 women, 3 respondents did not indicate their gender. Evaluating the offered assertions and coding of the factors and their characterizing statements were based on the interpretation of the findings by using the Likert scale – the procedure which is proposed by the questionnaire methodology. As well, the Mann – Whitney test and Kruskal – Wallis test, were used for quantitative data processing in SPSS 25.0 to identify a statistical significance depending on the profile of the respondents. At the starting stage of the data processing, Cronbach's alpha coefficient for internal consistency was calculated; the obtained result ($\alpha =, 857$) indicates good internal consistency.

Findings

Statistically significant differences ($p < .05$) in the self-assessments (Table 1) depending on the position of the respondents (student or educators), were found in the evaluations of two factors: *Negative Impact of IT* and *Positive Effect of IT on Work-Life*. In other factors, no significant differences related to the respondents' position were observed. The average scores indicate that both groups of respondents (students and educators) have an interest in IT; respondents are aware of the role of technologies in modern life and believe that gender equality is also provided and is not violated by their use.

Table 1. Respondents' assessment of attitudes towards IT factors

Factors	Mean		Statistical significance (p)
	Students	Educators	
Interest in Learning about IT	3,20	3,28	,227
Practical value of IT	3,73	3,77	,335
Negative Impact of IT	3,24	2,94	**,000**
Gender Equality of IT	4,02	3,99	,381
Positive Effect of IT on Work Life	3,46	3,31	**,046**

The analysis of statistically significant differences identifies that students more often (Mean Rank 529.63) than educators (Mean Rank 486.46) emphasize the Positive Effect of IT on Work-Life, as evidenced by the group's average rating factor. The analysis of the characterizing statements of the factor and statistically significant differences according to the position of the respondents (Table 2) are revealed only when assessing the statement *In general, IT will create more jobs than it eliminates*: students evaluate this claim higher (Mean Rank 137.07) than the educators (Mean Rank 106, 02). Analysis of the average values shows that educators, in general, disagree with this statement; they are aware that the lack of digital competence will reduce successful career opportunities. Significant differences are found in assessing the negative and positive *impact of IT on working life*: in both cases, doctoral students give a higher evaluation.

Table 2. Assessment of the qualifying statements of the factor Positive Effect of IT on Work Life

Statements	Mean		Statistical significance (p)
	Students	Educators	
In general, IT will create more jobs than eliminates	3,10	2,71	**,004**
Because of IT work will become more appealing	3,60	4,49	,199
Family-friendly environments are more available in IT occupations than others	3,09	3,04	,613
Because of IT, there will be more opportunities for the next generation	4,03	4,02	,794

Students responses argue that statistically significant differences (p = .008) are found in the evaluations of *With IT work will become more appealing*, depending on the field of science in which they are studying: medical and healthcare students are more likely to emphasize the attractiveness of IT use in their workplaces (Mean Rank 114, 58), while this view is seldom found with the students of agricultural and forestry sciences (Mean Rank 2.00), as well as with the students of humanities and arts (Mean Rank 79.66).

Evaluations of *Positive Effect of IT on Work-Life* confirm that respondents motivate their recognition of the impact of IT on the work environment by improving their digital competence; also they consider that students' motivation might improve their activities in the chosen field of science and work.

The analysis of the *Negative Impact of the IT* factor shows that the students' rating is higher (Mean Rank 538.62) than the assessment of

the educators' (Mean Rank 452.98), as evidenced by the group's average rating factor. Statistically significant differences were found in three-factor statements (Table 3). In all cases, the students' Mean Rank is higher if compared to that of the educators.

Table 3. Assessment of the qualifying statements of the Factor Negative Impact of IT

Statements	Mean		Statistical signifi-cance (p)	Mean Rank	
	Students	Educators		Students	Educators
IT makes our way of life change too fast	3,93	3,93	.958	130,39	130,93
Advancements in IT will eventually destroy the earth	2,83	2,45	**.021**	135,85	110,55
People would do better by living simpler life without so much IT	3,04	2,65	**.010**	136,50	108,13
IT applications create an artificial and inhuman way of living	3,18	2,71	**.001**	137,91	102,89

The findings show that students are more concerned about the increasing impact of IT. Perhaps this can be explained by the fact that educators use IT more in their professional field; if compared to students they are less affected by the digital technologies in their everyday lives. In their turn, students grew up in a digitized environment; their social contacts more often are virtual if compared to those of the educators. These assumptions need further detailed studies.

This implies that although IT is increasingly coming into all spheres of human life, including education and, for example, many of the studies highlight the benefits of learning by using digital tools (Sun, 2018; Weng et al., 2013), the direct student-educator connectivity is still considered important, it supports the achievement of its own goals, promotes social welfare and socialization in a particular environment (Arpino, & de Valk, 2018; Siedlecki et al. 2014). Learning by using the platforms offered by IT is just one way of facilitating modern individualization and differentiation according to the educational needs of each student, which should not become the main or even the only way. Student responses show that although they have a strong interest in IT, they crave for natural, human relationships that should not disappear from the learning environment.

The analysis also found statistically significant gender differences in the assessments (p = .002). Women more often (Mean Rank 135.18) agree

with the statement Advancements in IT will eventually destroy the earth than men (Mean Rank 99.07). There are also significant differences in student responses (p = .019), depending on the field of study, statement IT makes our way of life change too fast evaluations: more worried about medical and health (Mean Rank 113, 97) and natural science (Mean Rank 96, 80) students, less often in the field of agriculture and forestry (Mean Rank 1.50) and in the field of humanities and arts (Mean Rank 85, 54). The educators demonstrate statistically significant differences in the assessment It makes our way of life change too fast (p = .012): this aspect is more often of concern in the areas of science (Mean Rank 48, 50), seldom among the representatives of the agricultural and forest sciences (Mean Rank 1, 50).

The researchers' attention has been attracted by the evaluation related to the respondents' motivation, a need and the importance for non-stop improvement of their digital competence (Table 4).

Table 4. Respondents' interest in the development of their digital competence

Statements	Mean	Agree (%)	Significance of differences (p) according to	
			gender	position
It is important for me in my daily life to know about IT	3,82	68,1	.079	.260
IT courses make significant contribution to one's education	3,91	74,3	.632	.060
I enjoy learning about new IT discoveries	3,57	55,0	**.031**	.447
I am interested in new applications of IT for improving our lives	3,43	52,7	**.027**	.941
I like to read about IT-related topics	3,07	34,6	**.000**	.514
I have looked for information about IT advances on the Internet	3,02	39,2	**.000**	**.031**

The findings show that most respondents are aware of the need for digital competence and its continuous improvement. Men do it more independently – they are more likely than women to be interested in new applications, searching and reading information. Statistically significant differences were found in the attitudes towards IT courses as a contribution to self-education, depending on the field of science. In student responses (p = .035) the effectiveness of courses is more often recognized by these in engineering (Mean Rank 128, 25) and sciences (Mean Rank 124, 70),

less often by medical and health care students (Mean Rank 95, 26) and by agriculture and forestry students (Mean Rank 1. 50).

The educators' evaluations demonstrate statistically significant differences (p = .019) for this statement: the highest rating is given by the engineering educators (Mean Rank 42. 90), the lowest – by agriculture and forestry (Mean Rank 1. 00), also of humanities and arts (Mean Rank 15, 67). The results suggest that the level of digital competence differs across the fields of sciences; this peculiarity should be respected in curricula building. Daily activities in a particular area require not only a different level of competence but also influence the motivation for the development of digital competence.

Indirect information on positive motivation can be obtained from positive answers, like this: *It is important for me to know about IT, IT makes work more attractive, IT courses are an important contribution to self-education, IT for future generations will have more opportunities, I am interested in the latest IT applications that could improve our lives.*

Statistically significant differences (p = .031), depending on the position of the respondents, indicate that educators (Mean Rank 149, 12) are more likely to look for information about IT development on the Internet than students (Mean Rank 125,50). This makes it possible to conclude that teachers who usually are older than students would need more support in acquiring new IT possibilities. Today's students are safer with IT, they learn a lot from learning by doing, experiential learning, through reflecting, and also from each other.

Analysis of the data obtained in the Latvian cultural environment demonstrates differences in attitude towards IT; these were identified as being dependent on the profile and gender of respondents, also on positions and fields of sciences. Digital competence is perceived and understood by the respondents as a complex combination of knowledge, skills, attitudes, abilities, strategies; its complicated essence as well as assumption of the importance of IT and digital media for solving study, practice, research problems should be treated as a possibility of involving educators and students in effective communication, participation and cooperation to create and share new knowledge, deep understanding, acquiring new elaborate skills (Ferrari, 2012).

Additional research is needed to specify the level of digital competence for different groups of respondents (for instance, gender, profile, education, cultural context, etc.). This would allow for the identification of the educational needs of students and educators for the development of their digital competence consciously accept and appropriately meet the transformative impact of digital technologies.

Discussion

The commonalities and difference between student and educator attitude development towards the digital technologies in education should be treated according to their positions in this process. The educators' job includes their particular responsibility, therefore their attitude to innovations and quality process must become a matter for their targeted self-education. Students' current values and needs obtain their specificity because of a large variety and innovative character of digital devices and their usage; these objects of their attitudes are influenced by particular situations and cultural contexts. In the digital age, students demonstrate a stronger disposition towards technologies if compared to their educators. This sign of the digital age demands the re-addressing of the didactic principles of formal educational settings (Žogla, 2019) and treat the differences in attitudes as priorities to be effectively used in education.

When creating an appropriate curriculum at least three positions relating the context of the studies and setting didactic principles should be addressed to reduce strong normative constraints and transform an indoctrinating process into a learner learning-centered one (principles could be described in details for each faculty, speciality etc.):

a) knowledge considered by students as valuable usually causes positive emotions and is manifested in actions, therefore principles of a tertiary educational process should make an appropriate shift because currently students hold wider knowledge and digital skills, therefore have larger potential for decision-making and curricula construction if compared to their real participation in these activities;

b) values and needs are usually embedded in a concrete reality by respecting students' individual differences that are significant and therefore reflected in their attitudes; students' digital competence should be considered their individual difference and a priority to be applied in a tertiary process;

c) instead of using special stimuli for students' learning, educators share their responsibilities with the students; roles of educators and students become interchangeable, threfore motivating.

The contextuality of educators' and students' values are demonstrated and implemented when coupled with their sense of freedom and responsible attitude while being in their respective positions with interchangeable roles. Meanwhile, both of them hold equal positions regarding their on-going learning – none of them can succeed by being passive in learning or by the normative restrictions of their positions. Transformation of educational curricula goes through the joint venture of educator and student value exchange or problem-solving using educator and student experiences and

possibilities and breaking borders between students who, in normative settings prioritize students' features related to those of growing/developing persons (less experienced) and educators, who now prioritize their non-stop learning instead of prioritizing their experience.

Curricula of formal and informal/organized/assisted tertiary and further education do need clearly defined pedagogical approaches/ paradigms and educative goals which include a strong orientation towards responsible, critical, creative attitudes of future graduates to successfully meet the demands and priorities of their future jobs: graduates' and later employees' (also educators') appropriate personal qualities, if coupled with attitude development, become a precondition of targeted competence acquisition. Educational principles become the foundation for creating a model of students' and educators' attitude development to complete curricula transition. These can be grouped around the three levels of the digital competence, highlighting their essence, transformative character and demonstrating their step-by-step individual growth:

(a) instrumental level of competence as an ability to complete one's job;
(b) mastery level of this competence characterized by educators and graduates responsible attitude and ability to improve the educational and job process in particular and varied situations;
(c) educators' (future specialists of any area) expert level or even excellence in creative innovations that promote the development of a tertiary institution or tertiary education in general.

Therefore only reaching an instrumental level of competence in its traditional understanding for educators is not enough; this will stop a tertiary institution's development in its particular role.

The philosophical and psychological nature of attitudes prompts educators to prioritize attitudes and values to help students motivate their learning, and, when being learned, attitudes add to the learners' success and contribute to the development of even stronger attitudes. The foundations of educators' attitude to digital technologies and their usage should be re-addressed with the focus on its changes in accordance with the possibilities which digital technologies provide in their capacity as educational tools. Exploring and using the transformational and transformative character of digital technologies that interfere with the educators' attitude leads to a higher general and unique qualities which a tertiary curriculum aims to nurture and which their further learning helps to keep balanced with new possibilities.

Educators' on-going investigations in cooperation with their students, coupled with the students' preferences and possibilities, as well as targeted changes of pedagogical tools for successful assistance constitute the core of a tertiary process driven by and initiating further educators' attitude

change/development. Educator self-evaluation of their attitudes should be considered a part of their job to maintain high quality functioning; their targeted attitude development should be coupled with innovations to release synergy when educators and students mutually empower one another's development.

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TECHNOLOGY-ENHANCED LEARNING FOR THE DEVELOPMENT OF LEARNING MOTIVATION

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ABSTRACT

Technologies are an indispensable part of the 21st century; they shape people's lives, and it is getting more difficult to get and hold the attention of people, especially the younger generation, because of the ever-growing stream of information and information channels and platforms. In order to engage and motivate the learning of the younger generation, teachers cannot ignore the role of technologies in young people's lives.

The aim of this research is to identify opportunities to develop learning motivation and its correlation with technology-enhanced learning, as well as to compile the latest and most appropriate motivation theories in a contemporary context. To do so, a literature review was chosen as a research method to review articles obtained via the Scopus database, using the keyword 'learning motivation' to select the research units. For the systematic analysis of publications, the English language and open access availability were chosen as parameters to reduce the number of articles to review. To better understand the learning environment and the potential impact of technology-enhanced learning on learning motivation, a survey was carried out on secondary school students (10th to 12th grade) in Riga, Latvia.

Keywords: motivation theory, learning motivation, technology-enhanced learning.

Introduction

Technologies are an indispensable part of the 21st century; they shape people's perceptions, needs and interests. It is necessary to take into account the fact that it is getting more difficult to get and hold the attention of people, especially the younger generation, because of the ever-growing stream of information and information channels and platforms that has decreased the average attention span in the past few decades.

In order to engage and motivate the learning of the younger generation, but not only the youth, teachers and researchers need to search for new approaches and methods to apply in an educational process, and they also need to remember the impact of technologies in daily life and use them in their favour. There are some new approaches like gamification, virtual

reality, augmented reality, simulations and other technology-enhanced learning opportunities that show a positive impact on learning motivation and engagement development.

The aim of this research is to compile the latest and most appropriate motivation theories in a contemporary context and to identify the correlation between learning motivation and technology-enhanced learning in schools.

Methodology

To compile the latest and most appropriate motivation theories in a contemporary context, a literature review was chosen as a research method to review articles obtained via the Scopus database, published from 2014 to May 2019. The keyword 'learning motivation' was used to select the research units. For the systematic analysis of publications, the English language and open access availability were chosen as parameters to reduce the number of articles to review. In total, 47 articles were selected for analysis.

To better understand the learning environment and the potential impact of technology-enhanced learning on learning motivation, a survey was carried out in two secondary schools in Latvia. 84 students replied to the survey. Students were asked about themselves, their habits and their free time activities. With regard to school, they were asked for their favourite and least favourite subjects and their reasons for this. They were also asked about the methods and technologies used in lessons and about feedback from teachers.

Results of the literature review

As mentioned before, 47 articles were selected for review using a systematic analysis of publications. Of these articles, only 33 applied some of the motivation theories to the research carried out. 14 research articles, although researching learning motivation, had no theoretical background of motivation theories.

When researching learning motivation, the literature review revealed that the most commonly used motivation theories in these 33 articles were Self-Determination Theory by Edward L. Deci and Richard M. Ryan (Foster-Heinzer et al., 2016; Ho, 2017; Guo et al., 2018; Huang & Hsu, 2019; etc.) and Self-Efficacy Theory by Albert Bandura (Chang et al., 2018; Chen, 2017; Lee, 2017; Schumacher & Ifenthaler, 2018; Song et al., 2018; etc.), and the third most common theory was about intrinsic and extrinsic motivation (Chen et al., 2018; Hmeljak Sangawa, 2018; Kim & Kim, 2016; Li & Shieh, 2016; Wijaya, 2019; etc.). Although Self-Determination Theory implies intrinsic and extrinsic motivation, there were researchers who did

not mention Ryan and Deci's theory, which is why intrinsic and extrinsic motivation is separate. The next most often used theory was Flow Theory by Mihaly Csikszentmihalyi (Ebrahimzadeh & Alavi, 2016; Zhao et al., 2018; Chang et al., 2018; etc.). Other motivation theories detected in the articles were the four step model for promoting motivation in learning process: Attention, Relevance, Confidence, Satisfaction (ARCS) Model of motivational design by John Keller (Lin et al., 2018; Schumacher & Ifenthaler, 2018; Setiani et al., 2019; Zhang, 2017; etc.), Goal Theory (Lin et al., 2017; Liu & Chen, 2015; etc.) and others (see Figure 1).

Self-Determination Theory posits that there are two types of motivation – intrinsic and extrinsic. The authors of this theory, Ryan and Deci, state that although intrinsic motivation is an important type of motivation, most of the activities people do are extrinsically motivated (Ryan & Deci, 2000). Ryan and Deci identify three basic psychological needs in their theory: (1) the need for competence; (2) the need for connectedness; and (3) the need for autonomy, which nourishes self-determined motivation (Foster-Heinzer et al., 2016).
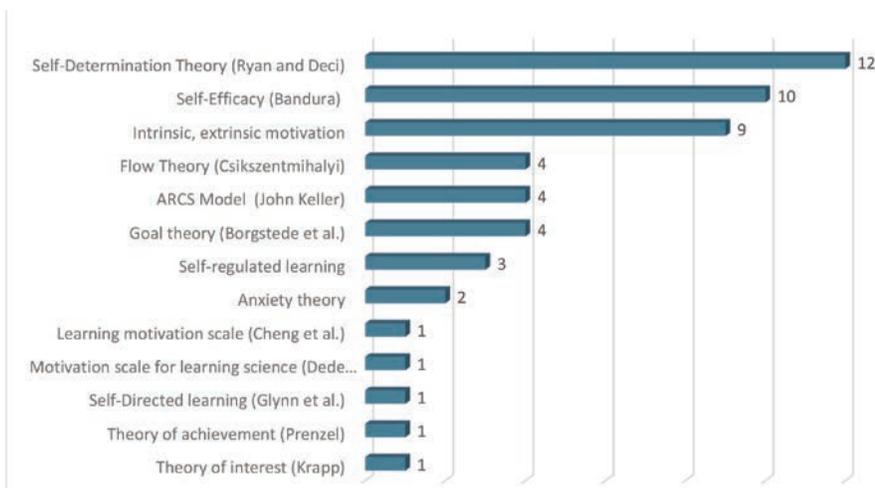
Figure 1. Motivation theories applied in research articles

In their article "Intrinsic and extrinsic motivation: classic definitions and new directions", Ryan and Deci develop a taxonomy of human motivation, explaining amotivation, four levels of extrinsic motivation and finally intrinsic motivation Associated processes with amotivation are low perceived competence, non-relevance, non-intentionality. Extrinsic motivation first level is external regulation who's associated processes are salience of extrinsic rewards and punishments. Second level of extrinsic motivation is introjection that is associated with ego involvement and

approval from self or others. Next level is identification associated with self-endorsement of goal and conscious valuing of activity. Processes that are associated with fourth level of extrinsic motivation (integration) is hierarchical synthesis of goals and congruence. And of course mostly desired is intrinsic motivation that is based on interest, enjoyment and inherent satisfaction of a person (Ryan & Deci, 2000, 61).

Self-Efficacy Theory by Bandura refers to our overall belief that a person can successfully achieve a particular result. Students with high self-efficacy can participate in learning activities more quickly (Chang et al., 2018). With regard to intrinsic and extrinsic motivation, the former means that the individual's motivational stimuli are coming from within, while extrinsic motivation means that the individual's motivational stimuli are coming from the outside as rewards, punishment or another outside source.

Flow Theory by Csikszentmihalyi is fully concentrated on and engaged in the immediate activity; as a result, anything else is insignificant. It is in a state of loss of self-consciousness and disregards the passage of time (as cited in Chang et al., 2018). This theory states that 'flow' is achieved when the skills and the challenge are in the right balance.

When talking about learning motivation, only 20 of the 47 articles include technology-enhanced learning, that is, 45% (see Figure 2). Of those 20 articles, e-learning was applied in seven articles, digital games in five articles, and three studies were about augmented reality. Virtual reality was also mentioned, as well as 3D, gamification and apps.
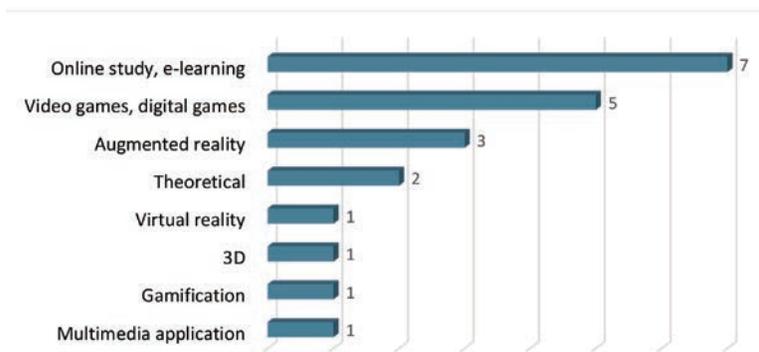
Figure 2. Technology-enhanced learning: approaches used and described in research articles

From the theories applied, Self-Determination Theory was extracted as the basic theory on which to construct a questionnaire for pupils using a taxonomy of human motivation (Ryan & Deci, 2000). Self-Efficacy Theory and eight characteristics of Flow Theory were also used. All these theories were applied to determine pupils' level of motivation.

Results of the survey

One of the aims of this research was to investigate the learning environment in two secondary schools in Latvia and the potential impact of technology-enhanced learning on learning motivation. To do so, an online survey was carried out in two secondary schools in Latvia – one in the capital, Riga, and the second was a rural school. Link to the online questionnaire was posted by teachers on the portal "E-class", that is accessible for teachers, pupils and their parents. Questions were divided into two section – first five questions were about pupils themselves, their habits, free time activities and technologies that they use and own. Second part of questionnaire contained 13 questions about school, pupils favourite and least favourite subjects and their reasons for this. They also replied to questions about the methods and technologies used in lessons and about feedback from teachers. During the research, the anonymity of the respondents was ensured and the requirements of research ethics were observed. 84 students replied to the online survey.

Of the 84 students who participated in the study, 72.6% (n = 61) were female, and 27.4 % (n = 23) were male. Pupils were aged from 15 to 19 years old, and 11.9 % (n = 10) of them were the only child in their family.
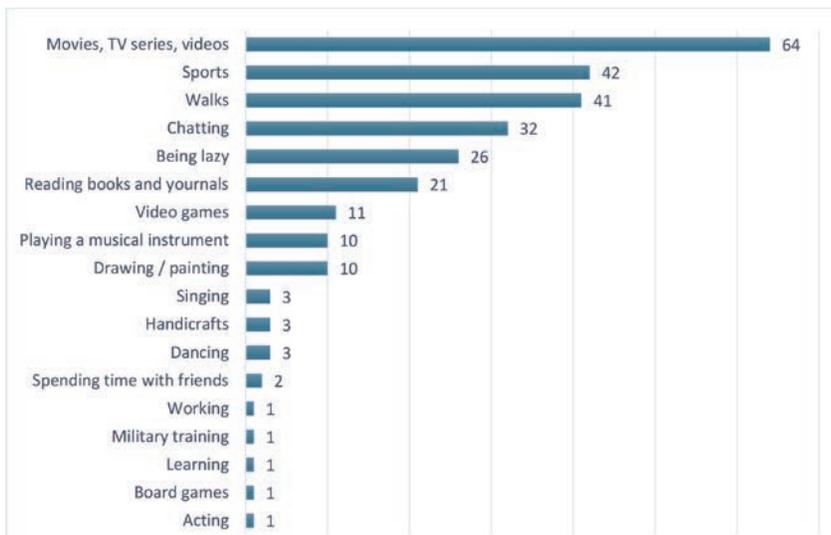
Figure 3. Free time activities of participants of the survey

The questionnaire revealed that, in their free time, these young people most of all like to watch movies, TV series or videos (n = 64), followed by sports activities (n = 42) and walks outside alone or with friends (n = 41). As Figure 4 shows, 32 of the respondents like to chat with friends in their

free time, but 21 of the pupils also like to be lazy. Figure 3 displays other answers given by pupils.

Asked which of the mentioned digital devices they own or share with their family members, all 84 respondents replied that they own a smartphone for personal use and almost half of them (n = 40) own a laptop for personal use, while 15 own a desktop computer for personal use (see Figure 4).
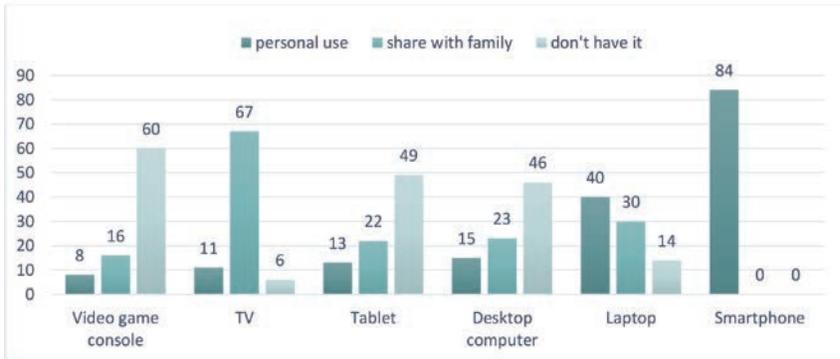
Figure 4. Technologies owned by the participants of the survey or shared with family members

Favourite subject

When pupils were asked about their favourite school subject, as Figure 5 shows, the most common answer was Maths (n = 13). Their next favourite subject was Psychology (n = 10), followed by Sports (n = 8) and English (n = 8).
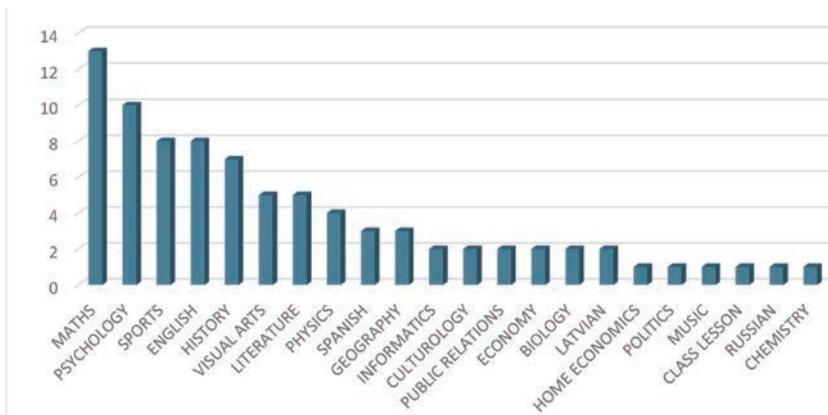
Figure 5. Favourite school subjects

Pupils were asked for the reasons why this is their favourite subject at school. Looking closer at Maths and the given answers to the question *why?* 37% (n = 7) of pupils' responses revealed that they find it exciting and interesting, and 37% (n = 7) of responses said that they see the subject as useful in the future. Also, 26% (n = 5) answered that they like the teacher.

If we analyse the reason for all the given answers about all the favourite subjects mentioned by the respondents (see Figure 6), the most common answer was "I find it exciting and interesting" (n = 66), followed by the answers "I like the teacher" (n = 55) and "It will be useful in the future" (n = 44).
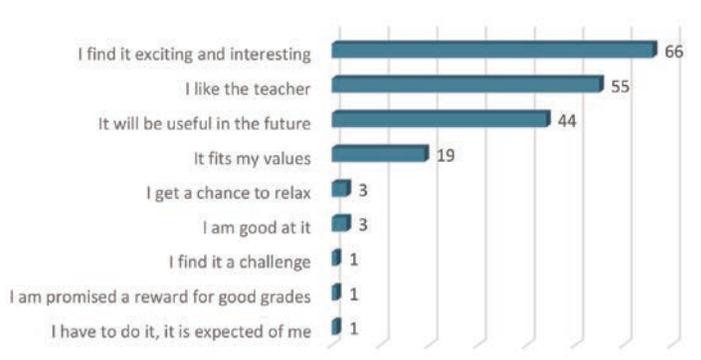
Figure 6. Answers to the question "Why is X your favourite subject?" based on the taxonomy of human motivation by Ryan and Deci

Analysing the given answers from the point of view of motivation theories, interest in the subject indicates an intrinsic motivation. Its usefulness in the future indicates an extrinsic but internalised motivation. However, liking the teacher indicates a feeling of self-belonging.

Asking the pupils to keep in mind the subject that they mentioned as their favourite, they were asked to describe the lessons, and the questions were based on the Flow Theory of Csikszentmihalyi (see Figure 7). 42 respondents answered that the lesson always has a clarity to its goals and 30 responded that goals are often clear. Feedback is given always (n = 41) or often (n = 25), and they often (n = 37) or always (n = 31) feel they have control over the tasks they are doing. And importantly, they often (n = 50) or always (n = 25) have complete concentration on the task. Lessons are also exciting and dynamic in most cases.
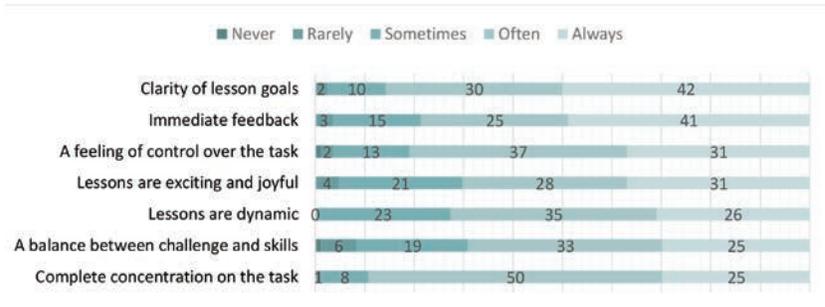
Figure 7. Description of the pupils' favourite subject based on Flow Theory

Least favourite subject

When the pupils were asked about their least favourite subject at school, the most common answer was also Maths (n = 15) (see Figure 8), which makes this subject controversial and dual-natured; survey data shows a correlation with the personality of the teacher. The next least favourite subjects were Chemistry (n = 13) and Physics (n = 12).
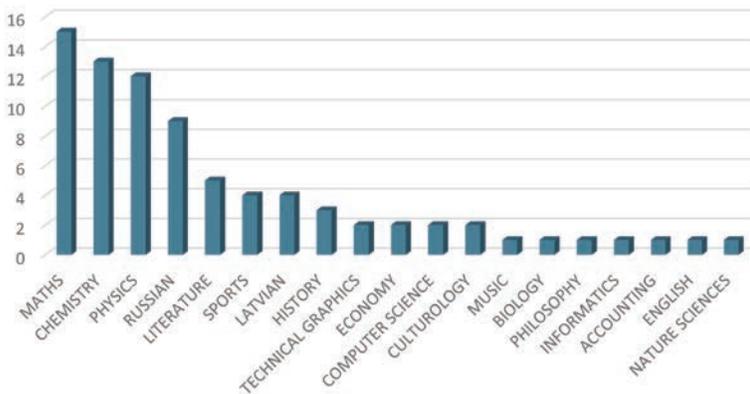
Figure 8. Least favourite school subjects

Looking closer at Maths as the least favourite subject and the reasons for this, the most common answer was "I am not good at it" (n = 6). Responses revealed that 22% (n = 4) do not find it interesting, and 22% (n = 4) of respondents said that they do not like the teacher. 17% (n = 3) of respondents said that the subject will not be useful in the future, while one pupil answered that his parents are putting pressure on him.

If we analyse the reasons for all the given answers about all the least favourite subjects mentioned by the respondents (see Figure 9), the most

common answer was "I am not good at it" (n = 56), followed by the answers "It doesn't interest me" (n = 45) and "I don't like the teacher" (n = 32). For 19 respondents, the subject will not be useful in the future.
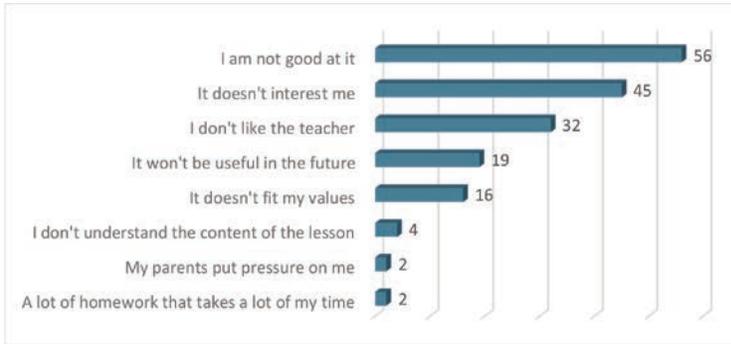
Figure 9. Answers to the question "Why is X your least favourite subject?" based on the taxonomy of human motivation by Ryan and Deci

Asking the pupils to keep in mind the subject that they mentioned as their least favourite subject, they were asked to describe these lessons, and the questions were also based on Flow Theory (see Figure 10). The respondents answered that the lessons are never (n = 33) or rarely (n = 33) exciting or joyful and that they do not feel they have control over the tasks or a balance between the challenge and the skills that they have.
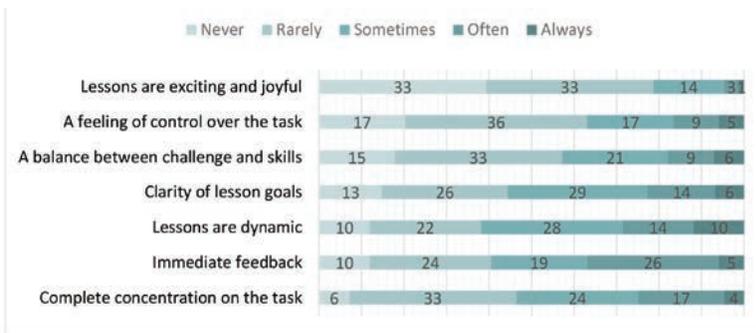
Figure 10. Description of the pupils' least favourite subject based on Flow Theory

During the online survey, pupils were also asked about the technologies used in lessons (see Figure 11). A projector is always (n = 27) or often (n = 51) used, and interactive board is also often (n = 49) or always (n = 19) used, also whiteboard. As was revealed in the study, smartphones are also sometimes (n = 40) or often (n = 21) used in lessons.
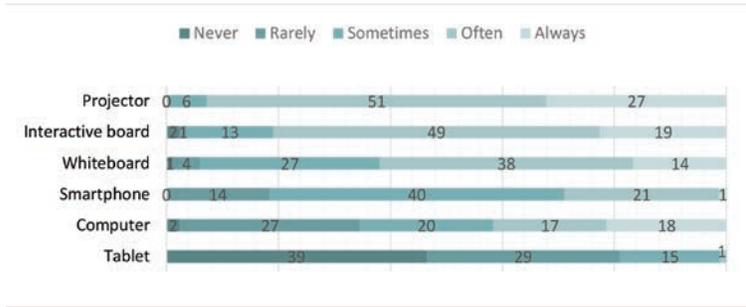
Figure 11. Frequency of use of technologies in lessons

When asked about situations when pupils need to find additional information for homework or tasks during the lessons, the most common source of information mentioned was online sources (see Figure 12), followed by friends, who are also, probably, looking for information online.

When asked what teachers allow pupils to use smartphones for, the most popular answer from respondents was to find information needed for the lesson online and sometimes to perform tasks online.
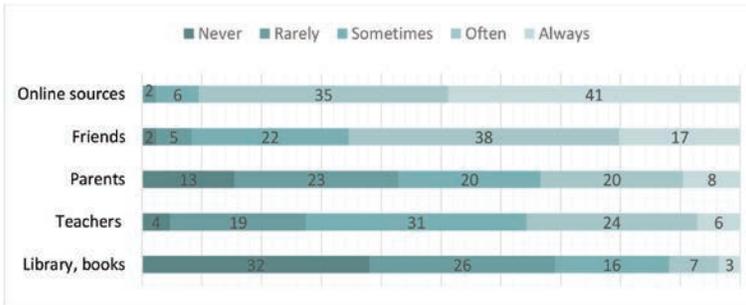
Figure 12. Additional sources of information

The analysed data revealed that students often (n = 69) or always (n = 9) work by themselves in lessons and that they often (n = 52) or always (n = 15) listen to the teacher. Group work or peer work is carried out rarely or sometimes. Games or quizzes on the topic of the lesson are never or rarely used as methods in lessons.

Feedback is very important to get a deeper understanding on a subject and mistakes that are made, which is why respondents were asked to evaluate the feedback given to them from their teachers (see Figure 13). The majority of respondents answered that they often (n = 42) or always (n = 13) get only the grade or often (n = 40) or always (n = 13) get only a pass or fail indicator. They only sometimes (n = 30) or rarely (n = 25)

get an explanation for their mistakes or get positive comments, and rarely (n = 31) or sometimes (n = 29) get a short comment on their mistakes.
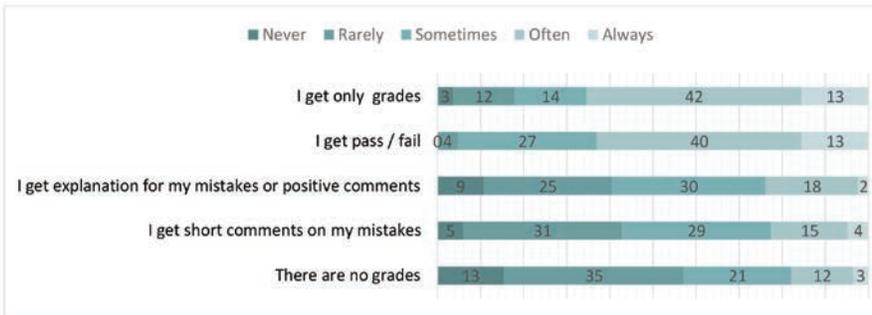
Figure 13. Feedback from teachers

As the study shows, for 68% of pupils, feedback is very important, because they want to know their mistakes so they can learn from them. 23% of respondents said that feedback is very important and they want to know why they received a particular grade. 9% of responses said that feedback from teachers would be desirable, but they can live without it. None of the respondents said that they do not need feedback from teachers.

Conclusion

Compiling motivation theories in a contemporary context with the help of a literature review revealed that the most commonly used motivation theories in research articles are Self-Determination Theory by Ryan and Deci, Self-Efficacy Theory by Bandura, Flow Theory by Csikszentmihalyi, the ARCS Model by Keller and Goal Theory.

The survey revealed that all respondents that participated in the research own a smartphone, but they do not use computers, tablets or TVs as much, because smartphones include all the options that are needed – both social and entertainment functions. Schools can use this as an opportunity to use them as an instrument in lessons. Although all surveyed students own a smartphone for personal use, it is not said that everyone has the same technical support to use them in the classroom. The teacher should assess the situation to be sure that all children are provided with this technology and act accordingly to avoid unpleasant situations.

One more important factor for learning motivation is the teacher's personality and performance in lessons. In the learning environment, the teacher is an agent who helps to develop important components of motivation, such as feedback, self-belonging, sense of worth, interest,

challenge etc., therefore, the teacher plays an important role in the development of learning motivation.

It is hard to tell from this research whether learning motivation has some correlation with technology, because the study did not reveal what the technologies are used for in lessons. Further research with qualitative methods is needed. But it can be concluded that technology-enhanced learning gives a student external motivation that can eventually lead to intrinsic motivation if the subject is interesting for them.

According to the questionnaire carried out during this research, there are students with intrinsic motivation or motivation with an external stimulus, but there are still many students with low level of learning motivation.

Education is not taking advantage of technologies fast enough – the rate of technology use in lessons is low. Schools do not use technologies and the opportunities and innovations that they offer. Although the use of technology does not create motivated learning, its wise use can contribute to the development of external motivation. This does not mean that technologies by themselves will do any good or harm; the key is to use the opportunities technologies provide, and only their smart and thoughtful use will help to engage students and motivate learning at a deeper level.

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THE IMPORTANCE OF DIGITAL RESOURCES IN THE INSTRUCTION OF MODERN LATVIAN LANGUAGE AND LITERATURE[1]

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ABSTRACT

The aim of the article is to provide an insight into the digital resources used in teaching Latvian language and literature, and to analyse the results of supplementing the syllabus with material from the digital dictionary "e-PUPA" in order to facilitate learners' interest in the varieties of the Latvian language, and of an in-depth study of literature through the use of various digital resources aimed to develop learners' digital literacy. The research was conducted for three academic years (2017–2019) in Riga Centre Language School (*Rīgas Centra humanitārā* ģimnāzija), involving 98 learners (total) from Grade 10. In order to achieve the intended outcome, a range of exercises and assignments were prepared.

 Work with these assignments encouraged the learners' critical and creative thinking, as well as their linguistic, communicative and digital literacy. It also helped them to perceive language units in a complex and functional way; strengthened the inter-subject link; enhanced their skills of text composition, research and cooperation; and encouraged self-guided learning.

Research results proved that the material included in the digital dictionary "e-PUPA" was useful in studying the Latvian language and literature. It helps learners to appreciate the richness, diversity and beauty of the Latvian language. Usage of the "e-PUPA" dictionary allowed the learners to deepen their knowledge in all sub-branches of linguistics and to expand their vocabulary. It also provided them with linguistically correct information about the phonetic, derivative and semantic structure of words, their grammatical features, etymology, functional environment, collocations, onymic systems, cultural labels etc., as well as their application in the regional dialects of Latvian, in Latgalian written language, and in foreign languages. Besides, the folklore material and excerpts from fiction and scientific works and publications, used to illustrate the meaning of certain lexical units, as well as various culturally historical facts and works of artenhanced learners' interest in the nations' world view reflected in the language.

Keywords: teaching/learning Latvian language and literature, digital resources, digital dictionary "e-PUPA".

Introduction

The rapid digitalisation of information has created new and previously unknown challenges in education. Both the educational establishments and the wider society have to accept the fact that information and communication technologies play a more and more significant role in everyday life; that new software and hardware is constantly being developed and the mobile devices are becoming more advanced. This allows people to digitally capture and share information in graphemic, audio or video format. Students at schools, universities etc. are not only able to participate in classroom activities in person, but also to record them, take photos of the relevant materials, organise group conferences, receive private lessons and consultations and submit assignments, at the same time being in another part of the world.

People tend to get accustomed to things that make their life easier. Therefore it is no surprise that the millennials see the internet and the materials available online as their principal source of information. It is therefore important to provide the learners with digital study materials, reference materials and digitised literary works alongside traditional books, thereby ensuring that the digital space contains relevant and high-quality resources. Carefully prepared digital materials are of great help to schoolteachers and university lecturers, as learners find them easily accessible and convenient to use.

The need to develop learners' digital literacy is closely linked with the emergence of the information society which replaced the industrial society around the turn of the centuries. Edvīns Karnītis notes that societal systems change only when the accumulated knowledge becomes restricted by the current model and when the existing model of social relations prevents further growth; when the knowledge level in the old system is sufficiently high to allow the society to move to the next stage of development. It is exactly at that point when all the necessary prerequisites give rise to new work methodology and relations, and to a new societal and political organisation (Karnītis 2004: 83).

At the beginning of this century, the accumulated knowledge base in pedagogy, digitalisation theory and practice, linguistics and literary theory had reached such a level and quality that the transition from the classical education triangle model (see *Picture 1*) to the new multimedial model was not only logical but also necessary for the knowledge society to evolve.
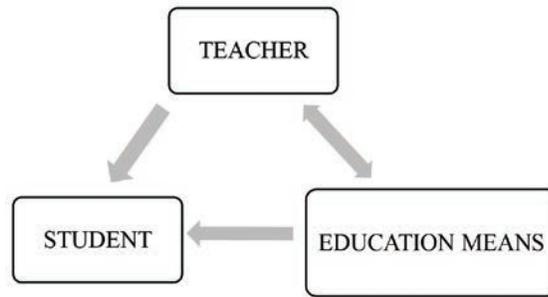
Picture 1. Classical education triangle model

Some characteristics of this model include the learners' ability to actively engage in the learning process; the acquisition of skills and knowledge not only through materials provided by teachers and the curriculum, but also through cooperation and discussions with classmates, as well as from various academic resources, including digital ones (see *Picture 2*).
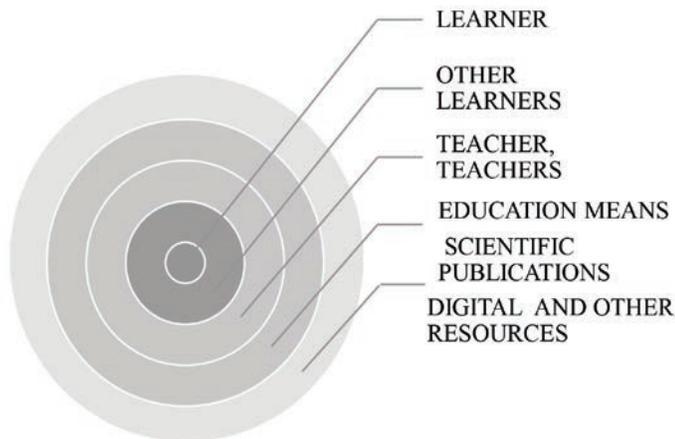
Picture 2. Multimedial model

Aim of the Study

The aim of the research was to understand the functionality and effectiveness of the newest digital resources (dictionary "e-PUPA", "Latvian Language Manual", "Map of Linguistics", educational tool "*Olūteņš*", and "Latgalian Spelling Tool") in the instruction of Latvian language and literature. This article provides brief information about each of these digital resources and the key conclusions on their usability. The article also details the practical experience of using the digital dictionary "e-PUPA".

Materials and Methods

This research is largely based on Action Theory (Joas, Beckert, 2001), as well as on the findings of various researchers about the application of digital study resources (Daniela, Rubene, Goba, 2018; Daniela, Kalniņa, Strods, 2017; Dudareva, 2018; Brinkley, Dessants, Flamm, 1999), WEB evaluation (Kapoun, 1998), and the devepment of digital skills (Ferrari, 2013) in the study process.

The study combined the descriptive method and content analysis, and was conducted by the help of experiments and questionnaires.

Content analysis was used in order to:

- select relevant working material after the survey of 409 entries of the digital dictionary "e-PUPA". The main objective of this analysis was to understand (a) the specific features of lexemes in different dialects, and their role in developing the linguistic and socio-cultural competence of the learners, and (b) the functionality of using dialect maps for learning purposes,
- analyse the riddles and tales composed by the learners themselves, thus testing their perception of dialectal words and their functional characteristics.

Each academic year, 30 entries of the dictionary "e-PUPA" were chosen for the experiment and offered to the learners for analysis. Each of them then had to choose one entry and to fulfill the assigned tasks (see below). Every month, the work was organised in the following stages:

- assignment of tasks and classroom discussions,
- getting acquainted with the structure of the dictionary,
- analysis of Latvian folktales and riddles,
- independent research work (selecting and exploring a dictionary entry, analysis of the map, processing and structuring the obtained linguistic information),
- creative work (writing riddles and tales),
- presentation of the results in the classroom; peer review and self-review with the help of a questionnaire.

Finally, the independent research work results were assessed and the questionnaire answers were analysed. On the whole, 98 learners were involved in the experiment over the course of three academic years.

Digital Resources

As mentioned previously, numerous tools have been created for implementation in the syllabi of teaching Latvian as a native or second language and the Latvian literature, in accordance with the standards agreed on in the project "Skola2030" (School2030). Among these tools, the most essential ones are are the digital dictionary "e-PUPA", "Latvian

Language Manual", "Map of Linguistics", as well as the educational tool "*Olūteņš*" and the "Latgalian Spelling Tool".

In 2018, three of these resources – "Map of Linguistics", "Latvian Language Manual" and "*Olūteņš*" – were completed, and in 2019 the development of a Latgalian spelling tool was began within the National Research Programme.

- • "Map of Linguistics" (http://www.lingvistiskakarte.lv) is a digital database containing information on various events, individuals and places related to linguistics (see *Picture 3*). The map is showing the locations of the relevant events, birthplaces of people etc. All parts of the "Map of Linguistics" are interactive. Entries can be grouped according to persons, publications, events, places, or branches of linguistics. Besides that, the database also offers several tourism routes in Latvia with downloadable and printable overview maps.
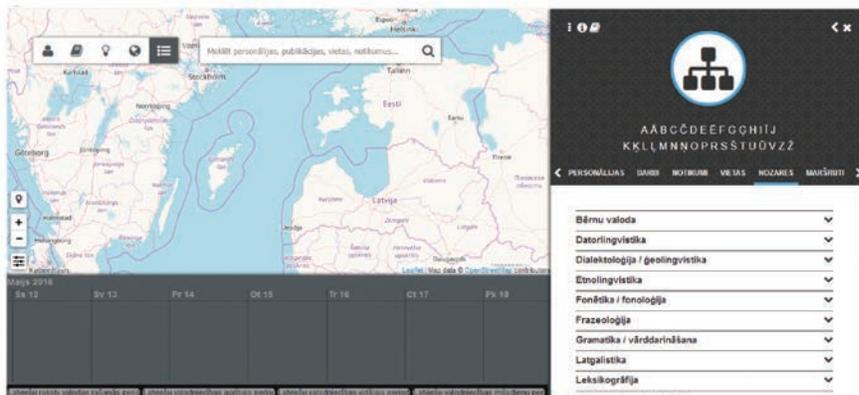
Picture 3. Map of Linguistics

- • "Latvian Language Manual" (http://valodasrokasgramata. lv/) is an encyclopaedic collection; it is a multifunctional and informativedigital educational tool on Latvian linguistics. It covers the main concepts of 26 branches and sub-branches of linguistics (containing over 1,500 entries or units). The material is compiled in two levels – basic and advanced. It contains theory, exercises, test questions, audio materials and linguistic maps (see *Picture 4*).

Picture 4. Latvian Language Manual

- The Latvian language has two written traditions – Standard Latvian and written Latgalian. For the purpose of teaching written Latgalian and regional studies in Latgale, the educational tool "*Olūteņš*" https://visc.gov.lv/vispizglitiba/saturs/dokumenti/ metmat/olutens_4kl_mac_lidz.pdf; https://visc.gov.lv/vispizglitiba/saturs/dokumenti/metmat/olutens_4kl_met_%20ieteikumi.pdf) for Grade 4 was elaborated (see *Picture 5*). It can also be successfully employed outside Latgale to learn more about this written tradition. The Latgalian spelling tool which is currently under development, will further support this.
- The work on compiling the multifunctional digital dictionary "e-PUPA" (see *Picture 6*) was began in 2011 (http://epupa.valoda. lv/). The dictionary contains word definitions, illustrations, dialect maps, as well as several articles by linguists, methodological instructions for teachers, and worksheets to be used in the study process.

Picture 5. Educational tool "Olūteņš"

Picture 6. Multifunctional digital dictionary "e-PUPA"

The scope of the entries is varied. There are full-scope entries (see *Picture 7*) consisting of 21 structural element covering approximately 40 pages (72,000 characters); medium-scope entries with up to 20 structural elements on approximately 20 pages (36,000 characters), and low-scope

entries with up to 20 structural elements on approximately 4 pages (7,200 characters). The basic concept of the dictionary is the idea that every human is a biological, spiritual and social being. This is the reason for including copious and diverse material in the dictionary.

Picture 7. The structure of an entry (stārķis 'stork')

The dictionary can be used as a supplement in teaching not only language and literature, but also other subjects. Apart from improving the learners' proficiency of language and literature, it also encourages their integration skills and inquisitive interest. Furthermore, the dictionary material can also be used in universities for students of philology, translation studies and education sciences; in courses where Latvian is taught as second or foreign language; in other kinds of informal education, and also in academic research.

In order to help the learners to learn how to learn (Fadels, Bialika, Trilings, 2016), the teachers need to cooperate, to create an appropriate learning environment, and to encourage the creative and critical thinking of the learners (Fisher, 2005a; Fisher, 2005b; Stikute 2011), as well as their skills of cooperation and research. For this purpose, appropriate set of resources and linguo-didactic materials have to be developed.

Elaborating the new standards and programmes for teaching the Latvian language and literature in the beginning of the 21ˢᵗ century, it became obvious that various easily accessible additional materials and resources would be necessary. The project "*Skola2030*" (School2030) of 2019, also emphasized the need to apply the possibilities and advantages of information technology and digital solutions in the education process, so that the learners would use digital resources not only for entertainment, but also for developing certain skills. These resources can help to acquire new knowledge, to enhance creativity and critical thinking, and to arrive to innovative learning solutions in the process (Daniela, Rubene, Goba, 2018, 3).

A vast array of digitalised material is already available for studying Latvian literature and the Latvian language. That includes websites containing scientific literature, study materials, texts and textbooks, dictionaries, encyclopaedias, power-point presentations, lectures and classroom notes. Digital study materials differ from the traditional materials in that they can be multi-modular, combining real, virtual and augmented study environment and thus they are a powerful tool for transforming the study process and enhancing the learning environment (Kirkwood, Price, 2014). At the same time, this situation also constitutes a problem. Overwhelming majority of these materials exist by themselves, meaning that they have not been integrated into the study curriculum and thus their application depends on the teacher's choice. Express interviews with learners (circa 500) of various subjects show that most teachers do not make use of the digital resources. The reasons for this, as explained by the teachers themselves, usually are the excessive workload as well as lack of knowledge and inability to include these materials in the study process. Therefore, a research was conducted during 2017–2019 to assess the ways

of applying the newest digital resources in teaching work with the aim to improve the educational content and the communicative competence of learners of language and literature.

Results

Enhancement of the educational content was conducted during 2017–2019, every year offering the following exercises to Grade 10 learners in their Latvian language classes:
- introduction to and definition of various branches of linguistics with the help of the digital dictionary "e-PUPA",
- study of word meanings, monosemantic and polysemantic words and their semantic structure,
- work with dialect maps and dialectal words,
- study of phraseological units, expansion of vocabulary.

For example, in order to learn that a single concept can be expressed in different ways, the learners had to select and review a dialect map from the "Atlas of the Latvian Dialects" (Laumane 1999), which can be accessed via the digital dictionary "e-PUPA". As a next step, they had to study the vocabulary of a particular sub-dialect. In the process the learners:
- obtained a basic theoretical notion of a dialect and a sub-dialect by reading relevant research and listening to the materials provided by the teacher. Furthermore, they gained more detailed knowledge about the differences of Latvian dialects and sub-dialects, as well as an insight into the historical events, geographic environment and other factors that have influenced them;
- learned to interpret dialect maps and to understand map legends, as well as to identify various Latvian sub-dialects and to understand their vocabulary.

Having completed the review of a map, the learners had to choose a medium for presenting and visualising the acquired information (e.g. by drawing a map, a table, or a schematic diagram; see *Picture 8*).

- LĪBISKAIS DIALEKTS
- VIDUS DIALEKTS
- AUGŠZEMNIEKU DIALEKTS

VĀRDI IZ SAKĀRTOTI DILDOŠĀ SECĪBĀ (IZ LELU) PĒC TO ĪZMAN-TOŠANAS BIEŽUMA.

Vārda *stārķis* izpēte			
	Lībiskais dialekts	**Vidus dialekts**	**Augšzemnieku dialekts**
Aists			Bērzpils
Bacans, Bocjans			Ezernieki, Malta, Rundēni, Asūne, Istra
Bačans			Kaunata
Bočaks			Viļaka
Gandr/ is, -s		Vaiņode, Nīgrande, Aizvīķi, Nīkrāce, Kaltēti	
Kaļests			Šķilbēni
Kaļusts			Viļaka
Kļikuns			Viļaka
Poļaks			Kaunata
Stārgs			Sunākste
Starka	Katvari, Lāde, Vainiži	Plātere, Ķeipene, Dauguļi, Suntaži, Svitene	Meņģele, Vestiena, Prauliena, Sarkaņi,
Stārka	Bīriņi, Limbaži	Lēdurga, Mujāni	Pļaviņas, Šāviena,
Starks	Svētciems, Rozēni, Vitrupe, Dzirciems	Birzgale, Dole, Ozolnieki, Garoza, Liece	Balvi, Mērdzene, Bērzgale, Viesīte, Zalve
Stārks	Engure, Usma	Tērvete, Auri, Līvbērze, Sātiņi, Milzkalne Misa	Sunākste, Tirza
Starķis	Dundaga, Nogale, Lauciene, Ainaži, Idus	Jaunpils, Lestene, Tome, Krape, Skrīveri, Ādaži	Kaplava, Saliena, Makašēni, Meirāni
Storķis	Stende, Laidze, Užava, Mērsrags, Upesgrīva		
Sventelis	Cīrava, Valtaiķi		
Svētainis	Rūjiena	Pampāļi, Ruba, Kursīši,	
Svēteklis		Gatarta	
Svētelis	Zlēkas, Strazde, Zentene, Lībagi, Kuldīga, Padure	Dzērbene, Veselava, Cēsis, Drabeši, Grobiņa	Dignāja, Līvāni, Saikava, Ļaudoņa, Mētriena
Svētēlis		Bārta, Nīca, Dunika,	
Svētenis		Bilska	

Vārda *stārķis* izpēte			
	Lībiskais dialekts	**Vidus dialekts**	**Augšzemnieku dialekts**
Svētnesis		Ceraukste	
Svētputns	Piltene, Ugāle, Padure, Ziras, Jūrkalne	Turlava, Raņķi, Rudbārži, Kurmāle	
Svētulis	Zlēkas, Valgale, Zentene	Remte, Bērze, Zaļenieki	Aizkraukle, Krustpils
Štargs		Sauka, Rite, Elkšņi	
Štarka			Barkava, Vīpe, Stirniene, Atašiene
Štarks			Āknīste, Bebrene, Nīcgale
Štarķis		Sala	
Tāks		Sīpele	
Tarks	Pāle	Zālīte, Rembate, Lielvārde, Baldone	
Tārks		Lēdmane	
Žubure			Barkava, Viļāni
Žugare			Atašiene
Žugure			Rudzēti, Preiļi, Gaigalava, Tilža, Lubāna
Žūrējs			Šķilbēni

Picture 8. Examples of learners' work

Finally, the learners had to fulfill a creative task: to write three interesting, witty and challenging riddles about the researched words. They also had to invent a tale of origin of a particular dialectal word. Assessment of the learners' work led to the following results and conclusions:

The analysis of dialect maps		Interpretation of dialectal words (%)		Genre (%)	
98 works	%	riddles (130 works)	tales of origin (98 works)	riddle	tale of origin
Excellent	72	17	29	81	78
Well	25	74	55	13	19
Average	3	8	16	5	3
Not done	0	1	0	1	0

In order to find out the learners' opinion about the usability and effectiveness of the newest digital resources in learning Latvian language and literature, a questionnaire was compiled. It included the following questions:

1. Can you name 3 to 5 new interesting facts that you learned by researching a particular dialectal word?
2. What else did you learn from this experiment/research?
3. What did you understand when fulfilling the assignments?
4. What thoughts did this research provoke?
5. What difficulties did you encounter during the experiment/research?

Summing up all the feedback of the experiment, it was concluded that the use of digital resources helped to improve and train various skills, namely:

- skills of researchand analysis, the ability to structure information and to draw relevant conclusions,
- critical thinking, i.e. the ability to rely on scientifically trustworthy sources, as well as to critically examine one's own and the others' work,
- written and verbal communication skills (including the composition of a formal message, as several pupils submitted their assignments to the teacher by e-mail via the e-classroom system,
- proficiency of using various digital resources and media. Several participants of the experiment confessed to having difficulties with this, as they found it easier to work from paper copies. Several learners admitted that it was difficult to use digital maps. These instances showed that school learners are not yet familiar with this kind of research work.

The learners later applied the experience gained from the above-described research in their literature classes as well – for instance, when analysing the role of dialectal words in a poem or prose text. The dictionary was also used to discuss the attitude of our ancestors towards various realia and the way their worldview is reflected in language and in folklore. Another important and significant outcome of this experiment was the fact that some learners became interested in developing dictionary entries of their own. For instance, one student elaborated an entry with the headword "Wedding" as the result of her project which later won the 2nd place in a nation-wide competition of school research projects in 2017.

By using "e-PUPA" and other digital resources, learners were able to develop self-guided learning skills, as they had to complete the assignments independently, including decisions on formatting and presenting their work. They also improved their responsibility and time management ability. The experimental study also helped to develop collaboration skills, as those learners who were absent from classes had to obtain information and advice from their peers as well, not only from their teacher.

When inventing and composing their own riddles and legends, the learners not only improved their knowledge of folklore and literature,

but also developed their creative thinking. They agreed that they had fun when doing this task where they could apply their creativity.

On the whole, this educational project improved the so-called inter-subject link (involving such subjects as geography, history of culture, and regional studies), as well as the ability to relate the acquired knowledge to real life. For example, several learners commented on certain dialectal features or vocabulary that they remembered having heard in their grandparents' native region.

Conclusions

The research lead to the following conclusions:
- the use of digital linguistic resources in the educational process depends on the teachers' awareness about their existence, as well as their desire to diversify the content of the curriculum and to offer new materials to their learners,
- the use of the digital dictionary, map and manual helps to improve learners' knowledge in all sub-branches of linguistics, to expand their vocabulary, and to obtaining linguistically correct information about the phonetic and semantic structure of words, their grammatical features, etymology, functional environment, collocations, onymic systems,
- the educational tool "*Olūteņš*" can be used in schools not only in Latgale but also elsewhere in Latvia in order to get acquainted with the Latgalian written language and cultural values. In addition, the "Latgalian Spelling Tool" can help to improve text-building skills,
- the resources "e-PUPA" and "Map of Linguistics" are useful not only for learning Latvian language and literature, but also in such subjects as foreign languages, history, cultural studies, geography etc.,
- all the above-mentioned digital resources can be successfully used as methodological aid for teachers, and also as academically correct sources of information and tools for developing linguo-didactic skills,
- the main advantage of digital resources is their availability at any time and place, and the possibility to obtain the necessary information quickly and easily. The use of IT promotes the differentiation and diversification of the study process through innovative means.

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THE USE OF DIGITAL TECHNOLOGIES IN SWEDISH TEACHER EDUCATION: EXPERIENCES BY MIGRANT TEACHERS

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ABSTRACT

Migrant teachers who wish to complement their studies to become eligible to teach in Swedish schools are a growing number of teacher students in Swedish teacher education. Since Swedish society is highly digitised, it is of interest to investigate how migrant teachers, attending four Swedish teacher education programmes, view teaching and learning, and moreover, how they estimate and experience the use of digital technologies. The results are discussed in relation to Illeris' redefined transformative learning theory. A convergent mixed methods research design, with a survey (N = 228), focus groups (N = 5), individual reflective texts s (N = 30), and individual interviews (N = 9), was applied. The participants had studied teacher education programmes in 57 countries/regions. The results highlight that some of the learning, when digital technologies were used (concerning values and identity, self-directed learning, and communication), reached the core identity and personality layer, and required learning as change – transformative learning. Migrant teachers expressed that the transformative learning experience took up to a year to accommodate.

Keywords: Teacher education; Migrant teachers; Digital technologies; Transformative learning.

Background

The digitalisation of Swedish society and education

Two important movements in Swedish society are digitalisation and migration. This study will address migrant teachers who have come to a digitised society where they attend Swedish teacher education. Their view of teaching and learning, as well as their experience with the use of digital technologies in Swedish teacher education, are of interest in relation to Illeris' (2014c) redefined transformative learning.

According to the Organisation for Economic Co-operation and Development (OECD, 2018), Sweden is among the top ten countries when it comes to society's digital transformation. Furthermore, the digital divide in Sweden is narrower than most other countries in the OECD, and the use of digital technologies by individuals is significant. According to Davidsson

and Thoresson (2017), Swedish people use the internet privately and in school extensively. According to the governmental Swedish National Digital Strategy and reports connected to it (Ministry of Enterprise and Innovation, 2011; Digitalisation Commission, 2014), digital competence includes the ability to keep up with digital technologies to obtain and retain employment. In addition, The National Digitalisation Strategy for the School System (Digitalisation Commission, 2017), states that the modernisation of Sweden starts in school, developing digital competence (having the knowledge and ability to find, analyse, critically reflect, create, and use digital technologies). Digital competence is also detailed in the national curricula (The National Agency for Education. Lgy 11, 2017; Lgr 11, 2017; Lpfö 98, 2016).

The digitalisation of Swedish teacher education

The demands of an information society are a push factor for a digitised teacher education. Bautista and Ortega-Ruiz (2015) discuss the importance of teachers' professional development in an era of globalisation, educating for the 21st century with self-directed, creative, and critical learners who are competent emotionally, socially, and technologically. Digital competence is discussed in Swedish higher education in the ordinance, "*Högskoleförordningen 2014:1096, Annex 2*" [The Higher Education Ordinance 2014:1096, Appendix 2] (Ministry of Education and Research, 2014): A future teacher must show digital competence and use it critically in teaching and learning as well as consider the role of the digital environment in the pedagogical occupation. Migrant teachers are expected to meet these requirements when they work in the Swedish school system.

However, teacher education in Sweden has been subject to criticism for not providing teachers-to-be with sufficient training in the pedagogical use of digital technologies, and the municipalities in Sweden complain about newly educated teachers' (Swedish teacher students in general) lack of digital competence. It is argued that teacher education must be in sync with society's development (Digitalisation Commission, 2014, p. 166 and 206). Enochsson (2010) investigated how Swedish teacher students in general at twenty-one teacher education programmes were prepared for future teaching with digital technologies. The integration of pedagogical digital use was missing, and the most common way to use technology was writing reports and communicating. In a more recent study (Demoskop, 2016), 1346 Swedish teacher students (in general) were interviewed about digitalisation in teacher education. Almost 50% considered themselves insufficiently prepared, in their teacher education programmes, to be able to teach with digital technologies, even though 75% considered themselves highly digitally competent. There were distinct requests to

enhance digitalisation, with associations to virtual classrooms, web-based examinations and lectures, and digital technologies that boost student learning.

Migrant teachers in Swedish teacher education

In addition to the personal challenges of migration, a part of today's global educational field, migrant teachers' professional identity becomes a subject of reflection and transformation when they encounter the Swedish educational system and the use of digital technologies in a digitised society. In Sweden, there is a government-mandated programme called *"Utländska Lärares Vidareutbildning"* [Further Education for Foreign Teachers], which started in 2007. The programme is still running in 2019 and offers additional training for people who have a foreign teaching degree and wish to become eligible to teach in Sweden. In this programme, an individual study plan for 1–2 years is designed, including educational science, as well as education about the Swedish school's organisation, values, laws, and knowledge about grading, among other things. During their education, migrant teachers receive help to identify competencies they already have, those they need to modify for their new teacher role, as well as methods that might not carry over into their new role. Lastly, migrant teachers have a placement period, where they can put theoretical knowledge into practical use.

Theoretical framework

Transformative learning

In order to understand migrant teachers' experiences with the use of digital technologies, the concept of transformative learning was applied. Life today is a time of constant change and transformation, which make learning a lifelong process. According to Illeris (2014b, p. 40), transformative learning is defined like this: "The concept of transformative learning comprises all learning, which implies changes in the identity of the learner."

Transformative learning, as a concept, was launched by Mezirow (1978), while he was studying women's liberation processes in courses, during which changes in their self-perceptions were seen. For Mezirow, transformative learning involved qualitative changes in the learner's perspectives of meaning (how a person understands him- or herself), mainly cognitive, or frames of reference (meaning perspectives). Most central in transformative learning is critical thinking. Critical thinking and change fall in line with Taylor's argument (2012) that a necessity for intercultural

understanding is the ability to think critically about one's own beliefs and then change.

Mezirow's definition has been criticised for being too narrow, which made Illeris (2014a; 2014b; 2014c) widen the concept. According to Illeris (2017), there are two basic processes of learning: the integration of external interaction and the internal psychological elaboration. The latter involves the content (what is learned) and the learning incentive (motivation, emotion, volition). All learning is situated; specific situations are experienced and interpreted by the learner (Illeris, 2014b; 2017).

There is a distinction between learning as:
- *addition* (cumulative, a pattern already is established)
- *assimilative* (new things are added to what is already known)
- *change* (accommodative)

There are different types of *accommodation*: the *ordinary* — when someone understands something in a new way by accepting what is different, and the *transformative* — when the learner changes his meaning, perspectives, or ways of behaviour. Transformative learning includes cognitive, emotional, and social dimensions. For Illeris (2014a; 2014b; 2014c; 2017), the target area of transformative learning is the identity, covering cognitive, emotional, and social dimensions.

There are three layers in Illeris' (2014c) model of identity. First, we have an inner core, the *core identity,* which is quite constant and specific for the individual. Secondly, we have the *personality layer,* which is the main target for transformative learning. This layer changes with new experiences and consists of an individual's values, understanding, behaviour, habits of communication, patterns of collaboration, et cetera. Lastly, we have the *preference layer,* a more surface-based layer that relates to additional learning as what a person prefers, routines, automatic reactions, and is not targeted for transformative learning. During life, the identity is created, developed, and changed. In addition to the three layers, Illeris (2014b) addresses the person as a whole, with part-identities known as *attitudes* (national-cultural identity and religious-political identity), and *practice* (work-, family- and every day/interest identity). Migrant teachers often find themselves in a huge transition that relates to these part-identities: changing country, language, and sometimes, experiencing unfamiliar teaching and learning. Identifying competence development that meets migrant teachers' needs becomes important. For Illeris (2014a), competence is more than qualification; it reinforces the learner's capability to function in new situations, closely related to one's identity and how one functions in society.

Knowing that competence helps a learner to function in a new environment, there are some elements to integrate into migrant teachers'

further development. According to Taylor (2009), there are some core elements that guide a transformative practice: individual experience, critical reflection, dialogue/discussion, awareness of context, and authentic relationships. Altogether, transformative learning demands a learner-centred approach. For Illeris (2014b; 2017), a practice or problem-oriented teaching and learning is a must. The competence development requires a) *engagement,* b) *practice/problem,* and c) *reflection.* However, the transformation can be offensive, regressive, or defensive when it is too demanding, and the learner can feel uncertain about education. The result can be withdrawal or regression if the learner lacks the strength or qualifications to deal with change. Another consequence can be to resign and accept things (Illeris, 2014b; 2017).

The aim of the study and research questions

Both technology development and migration are part of the global educational field. With these comes, diversity in the use of digital technologies and pedagogy. In order to understand migrant teachers' experiences of the use of digital technologies in Swedish teacher education, we have to investigate the estimated use of technologies in their former teacher education in relation to the Swedish one, as well as their view of teaching and learning. There is a lack of studies examining migrant teachers' experience with the use of digital technologies (in Swedish teacher education). This study aims to understand migrant teachers' experience when digital technologies are used in Swedish teacher education, in relation to Illeris' redefined transformative learning (Illeris, 2014b).

Research questions:
- Which estimated use of digital technologies did migrant teachers experience in teacher education programmes?
- What view do migrant teachers have about teaching and learning?
- What learning, in relation to Illeris' redefined theory of transformative learning, was identified when digital technologies were used?

Methods

Research design

A convergent mixed methods design was used (Creswell & Plano Clark, 2011). Both quantitative and qualitative data were collected through a web survey, individual interviews, focus groups, and reflective texts written by the participants. The data results and analysis were mixed and converged to gain a more nuanced view of the respondents' experiences. The purpose of a converged mixed methods design is to use both qualitative and quantitative results, analyse them each separately and then mix them.

Population

The web survey targeted all actively enrolled migrant teacher students participating in a government-mandated programme: *"Further Education for Foreign Teachers"*. An overall view of the population can be seen in Appendix A. A call for participation in the qualitative data collection was included in the web survey and the email to all enrolled migrant teachers. The migrant teachers' former teacher education was conducted in 57 countries/regions. Four Swedish universities participated in this study. Due to confidentiality, the participating universities were named: University A, University B, University C, and University D. Migrant teachers are a heterogeneous group. In Appendix B, their age, years of former teacher education at the university level and specialisations are displayed.

Ethics

The Swedish Research Council (Hermerén, 2017) states that the main concepts of ethical concern in research are professional secrecy, anonymising or de-identifying respondents, and confidentiality, which were considered in this study as follows. Information was given to the migrant teachers about the study's purpose, representation, and the voluntary nature of participation. Furthermore, migrant teachers were informed that participation would not affect their grades and that they could withdraw from the study at any time.

Data collection

To provide material that complemented each other, a mix of four data collection methods – a web survey, individual interviews, focus group interviews, and participants' reflective texts – were used. Contact was made to the National Director for the project and the administration at each university, and information about the present study was given. Through the Universities' administrations, the respondents' emails were sent to the author.

Quantitative data

The respondents received information about the web survey in several ways (via management systems, email, seminars, and lectures) and it was sent via an online system to the entire population of 465 migrant teachers, and of those, 228 (49%) answered. The survey contained an information page and four sections: a) demography; b) teaching philosophy; c) ways of thinking and practising in Swedish education that could be experienced as unfamiliar; and d) digital competence. The respondents could answer the web survey with any digital device, and they could stop whenever they

wanted and continue at any time. In this article, the focus is on section a, b and d of the survey.

Qualitative data

All data collections covered the following themes: ways of thinking and practising, digital competence, and teaching philosophy. At the end of the survey, the migrant teachers had the opportunity to permit the author to contact them for an interview. Semi-structured interviews were conducted, including nine individual interviews and five focus group interviews with a total of 34 individuals. Both the focus group and the individual interviews were held at the participants' universities in rooms that were familiar to them, lasted between 40 to 70 minutes and were digitally audio recorded by the interviewer. The migrant teachers were instructed that there were no right or wrong answers and that it was essential to reveal their own experiences. As an introduction to the interviews, the respondents were shown the thematic areas that would be discussed during the interviews. The focus group method was chosen to capture experiences, enabling migrant teachers to share and compare with each other. This interaction reveals data not captured in individual interviews. On the other hand, the individual interviews provided more in-depth insights since the participants were able to express themselves without the influence of others (Cousin, 2009). Additionally, reflective texts and the open-ended answers from the web-survey were collected. Fifteen migrant teachers sent in 30 reflective texts, stemming from the course: "*To be a teacher in Sweden*" (22.5 credits). As a course assignment at University A, migrant teachers were asked to reflect over teaching and learning in Sweden compared to their former teacher education and work. The texts were voluntarily sent through an online system or sent to the author by email.

Data analysis

The survey contributed to background data about the migrant teachers, see Appendix A, and Appendix B. The other quantitative data from the web survey were analysed using SPSS version 24, and Excel 2013 showing numbers and percentages. In addition, a descriptive analysis was conducted. Each of the interviews was transcribed verbatim in Swedish. The qualitative data was transferred into MAXQDA version 12, and Pro analytics 2018, a qualitative data analysis software, for further processing and content analysis. The qualitative data were read several times to obtain an overview and understanding of the material. The segments were coded into categories and quotations were chosen based on their representativeness. The mixed analysis quantified some of the qualitative data. In addition,

it made the quantitative data more transparent by displaying qualitative quotations connected to them.

Results

Parts in the results

This study described migrant teachers estimated the use of digital technologies in teacher education programmes and, in addition, their view of teaching and learning. Furthermore, migrant teachers' experiences when digital technologies were used, were identified and discussed in relation to Illeris' theory of redefined transformative learning. The results were divided into three parts: (A) Estimated use of digital technologies; (B) View of teaching and learning and (C) Digital technologies, learning and identity. First, a non-response analysis will be presented.

Non-response analysis

The response rate of the online survey was 49%, see Appendix A. The participants who answered the survey were 88% female and 12%, male. They covered the entire spectra of migrant teachers concerning age, subjects, and specialisation. Furthermore, all were active students with the possibility to respond to the survey, which makes the natural non-response (not being able to answer because of serious illness, travels) a non-issue. Other aspects could have an impact on the non-response: The fact that the survey was in Swedish, not the participants' first language; it was a lengthy survey and; there was a possible lack of interest in the subject of digital competence. It could also be that for some participants, the effort to use the devices and answer the survey was daunting. Although the response rate had a risk of bias due to language difficulties and the length of the digital survey, the convergent research design covered a broad spectrum of perspectives from migrant teaching students.

(A) Estimated use of digital technologies

To understand the use of digital technologies in Swedish teacher education, it was of interest to investigate if it was used by teacher educators and placement supervisors at their former teacher education programmes as well. Migrant teachers estimated what percentage of their teacher educators and placement supervisors, in Sweden and their former countries, combined content, digital technologies and teaching strategies. The estimated use in Sweden was measured after at least one semester, up until the end of their further development studies. An overview can be seen in Figure.

THE USE OF DIGITAL TECHNOLOGIES

	25% or less	26% - 50%	51% - 75%	76%-100%
Former country - Teacher education	122	45	23	13
Sweden - Teacher education	16	37	70	82
Former country - Placement supervisors	126	40	21	12
Sweden - Placement supervisors	27	51	70	50
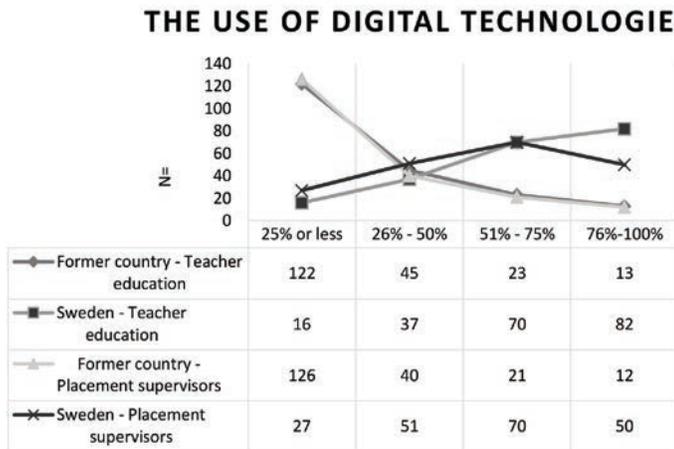
Figure. Results of the use of digital technologies

Note. This table shows how migrant teachers estimate the use of digital technologies in teacher education in Sweden and former teacher education, as well as the placement supervisors during their placement period in both countries.

When looking at the 76–100th percentile, see Figure, the results show that the use of digital technology was estimated higher in Sweden, both in teacher education (n = 82) and among the placement supervisors (n = 50), in comparison with their former teacher education (n = 13), as well as among their placement supervisors (n = 12). However, there were migrant teachers who thought that digital technologies were used more often in their former education. The result is not to be read that the use of digital technologies is more prevalent in Sweden. It was not possible to make this comparison since, to have accurate results, the study should be done in each country at the same time. However, the results give information regarding if migrant teachers, who attend Swedish teacher education programmes, were educated in digital technologies in their former countries.

In the mixed method analysis of using digital technologies in teacher education, three qualitative categories of use were found and counted, a) more use in Swedish teacher education ($n = 172$), b) the same use in both countries ($n = 56$), and c) more use at former teacher education ($n = 12$), altogether $N = 240$ qualitatively coded segments.

Table. A mixed methods table that shows the number and quotations of the use of digital technologies in teacher education in relation to former teacher education

Category	$N = 240$ qualitative coded segments	Quotation
a) more use in Swedish teacher education	($n = 172$)	'The teaching is different [in Sweden], there are a lot of digital technologies in use that I never had as a teacher-student [former country]. The other thing is the way you participate as a teacher-student during the lessons; I was not used to this.'
b) the same use in both countries	($n = 56$)	'No, there is no difference.'
c) more use at former teacher education	($n = 12$)	'I believe that the spectrum of courses is broad [former country]. Parallel with courses in the subject is didactical courses how to teach, didactical knowledge and tools. Later on, you try them out in reality during the practice. You must show your theoretical knowledge in practice, adapting your lessons."

In category *a) More use of digital technologies in Swedish teacher education* (*n* = 172 qualitative coded segments), migrant teachers were not only referring to the amount of digital technology in use as being something unfamiliar but also how and why it was used in teaching and learning. The accessibility and possibility to use digital technologies was lacking in the former country due to money issues, war, or restrictions by the government to use some of the technologies, or that the former education was conducted a long time ago. Other reasons were lack of interest or incitement to use digital technology or that more traditional methods for teaching and learning were preferred.

In category b) *The same use* (*n* = 56), migrant teachers found the use of digital technologies in Swedish teacher education familiar and the teaching and learning that comes with it. Digital technologies used for information, administration, and presentations were common in their former education as well.

In category c) *More use at the former teacher education* (*n* = 12), migrant teachers expressed that digital technologies were used more often and were well-integrated in all subjects in their former teacher education. The use of digital tools and apps (online collaborative learning, social media, smartboards, programs included in the subject books, programming, and working with different projects using e-learning) were taught and integrated in practice. Migrant teachers studied the subject content parallel

with courses in digital technologies. Moreover, they practised what was learned during their placement period.

(B) View of teaching and learning

A task and a challenge for teacher education, when providing further development for migrant teachers, is the diversity within the views of teaching and learning. Teachers' philosophies have bearing on which teaching approaches are chosen, hence how digital technologies are used and experienced in teacher education. Findings in this study show this diversity in teaching philosophy, the view of the role as a teacher, the students, how learning occurs and finally, the relationship between education and society. The web survey included 23 statements about teaching philosophy, answered by $n = 213$ to $n = 219$ migrant teachers. For more detailed findings, see Appendix C.

A common discussion is whether teaching should be teacher- or student-centred. A teacher-directed education was agreed with by $n = 116$, but $n = 27$ of migrant teachers disagreed. Altogether, most of the migrant teachers saw themselves as mainly both a subject expert ($n = 136$) and mentor ($n = 177$), and moreover, preferred to work in a team ($n = 142$). However, there are migrant teachers that rejected a mentoring ($n = 14$) and an intermediary ($n = 47$) teacher role and preferred to work alone ($n = 21$). However, to have a more caring and cherished teacher role was agreed with by $n = 140$, while only $n = 18$ disagreed. In Sweden, the emphasis is on student-centred teaching, both within teacher education and in schools.

Findings connected to migrant teachers' views of the role as a student show that a majority view students as responsible and independent ($n = 123$), while $n = 23$ disagreed. Seeing students as passive and needing to be controlled so that learning can occur was more evenly distributed – $n = 60$ migrant teachers agreed, $n = 55$ neither agreed nor disagreed, and $n = 98$ disagreed. Despite this, the majority also viewed students as responsible and independent, and considered training students' social skills ($n = 176$) and independence ($n = 178$) a task for the teacher.

The statements about learning show a diverse picture. The statement that students learn the most when schools emphasise hard work, respect and discipline were agreed with by $n = 95$ migrant teachers, $n = 61$ neither agreed nor disagreed, and $n = 60$ disagreed. In addition, a majority saw the importance of student motivation related to learning ($n = 205$) and creating an encouraging atmosphere which promotes the students' development ($n = 206$). How students learn was a divider. Social learning, the idea that students learn most when they work together, was agreed with by a majority ($n = 164$). Autonomous, self-directed learning was not

appreciated by all, and even though $n = 147$ migrant teachers agreed that students should be active, decide what and how they shall learn something, $n = 16$ disagreed with this idea. A majority agreed with the statement that teaching shall build on students' earlier experiences ($n = 174$), be aligned with the students' understanding ($n = 209$), and adapt individually to each student ($n = 169$). However, there were still those who disagreed. The findings show that some migrant teachers disagreed to learning built on earlier experiences ($n = 12$), align with understandings ($n = 3$), and individually adapted ($n = 17$). Process or product focus on learning divided the teachers. The focus shall be on the teaching process and not the end product was agreed with by $n = 133$, however, $n = 57$ neither agreed nor disagreed, and $n = 26$ disagreed. In Sweden, both active autonomous and social learning is common. Furthermore, building on earlier experiences and understanding and emphasising the process is considered important.

Some of the statements were directed towards the role of education in society. In Sweden, this is important in ordinances and curricula. Most migrant teachers agreed with a close working relationship between school, education and society ($n = 179$), also that teaching should relate to life outside school ($n = 190$). Sweden is a digitalised society, and only n $= 7$ migrant teachers disagreed that information technology must be integrated into teaching. A more diverse picture showed n $= 123$ agreeing and n $= 42$ disagreeing with the statement: Education shall be the same in all schools and not vary between different teachers.

(C) Digital technologies, learning and identity

This study aims to understand migrant teachers' learning when digital technologies are used in Swedish teacher education, in relation to Illeris' redefined transformative learning (2014b). The target area for transformative learning is the identity (cognitive, emotional, and social). It is important to remember that migrant teachers are not a homogenous group; there is a span between unfamiliar to familiar experiences, with learning that is individually situated and interpreted. In this second part, the three layers of identity were used for categorising the migrant teachers' experiences: a) The core identity; b) The personality layer, and c) The preference layer. Regressive transformative learning will also be discussed.

The core identity

Migrant teachers, having come to Sweden for many different reasons such as war, work, or relationships, are in a huge transition, changing cultures and language. "When I migrated to Sweden, I was in limbo for a year. I did not know who I was; I got problems with my identity." Expressing this

touches the core centre of the identity, wherewith a person has the sense of being an individual. On their journey towards finding themselves as individuals and their role as teachers in Sweden, they expressed that this society has shared perspectives, certain values and principles that are taken for granted but can appear contradictory to those of their former country. It can be very different from having a work identity as a teacher in Sweden, seen as more of a supervisor while coming from a country where the teacher is viewed as a strong authoritative figure that people look up to. "I was like a mayor in my former country." The analysis also presented that some migrant teachers used digital technologies to process and understand their identities in the new Swedish context compared to their former country. Digital technologies and its influence on identity, gender issues, et cetera were considered unfamiliar and an eye-opener.

The personality layer

Expressions of unfamiliarity in the personality layer, related to values, behaviour, and how to collaborate, were found. As for the core identity, some migrant teachers used digital technology as a tool to gain knowledge and compare concepts to understand the foundation of teaching and learning in Sweden in relation to themselves as teachers. "I searched the Internet to compare the concept of fundamental values within educational systems [in different countries]." However, it was not only the technology that was unfamiliar; the challenge of shifting pedagogical perspectives was a big issue. "It was scary being so autonomous from the beginning." For some migrant teachers, the ordinary accommodation, understanding and accepting new ways, was not enough. Hence, a transformative accommodation, in which the migrant teacher changes both the meaning perspectives and ways of behaviour, was expressed. There was a conflict between earlier strategies for learning and how one perceived oneself.

It was problematic for me to conform… It took me about a year to get used to and use this way of learning [self-directed, autonomous]. I was very stressed out. You have the former system of doing things within you.

Furthermore, within the new learning context, new patterns of collaboration followed. Digital communication and socialisation, as part of their studies, were experienced as unfamiliar, especially in the teacher educator-migrant teacher relationship. "I never socialised with teachers online [former country]." According to migrant teachers, digital technologies can make contact better, the feeling that the teacher educator sees them – for example, with giving answers and feedback more easily. There is a risk, though that the use of online technologies minimises the time with the teacher educator. Online tools can decrease the gap, but only if the teacher educator is present and engaged in the online environment.

However, teaching about digital technologies and how they are used in social interaction [in Sweden] is lacking, even though it is something new. "Interesting insights for me were the learning connected to social aspects."

Digital technologies were mostly recognised by migrant teacher students as an aid in their studies. The idea that they could experience help even when they were not on-site at the education programme, the accessibility to lectures, peer support, and writing and communicating with others was something important. "It [digital technologies] helped me to finish my studies." Furthermore, using online technology was helpful due to the large variety in their private lives. "For me, as a mother, digital technologies made it so much easier to study… I did not have to leave my children at home." For some migrant teachers, learning to communicate online was more like learning as change, in both the ordinary accommodation and transformative learning, as they were not used to being exposed to sharing their thoughts and texts in this way. In these cases, the external and internal elaboration was more of a challenge. Thus, migrant teachers express a lack of education in the use of digital technologies for teaching and learning.

In teacher education [Sweden] we use digital technologies almost every lesson, presentations et cetera. We do not get it [how to use it in teaching and learning] from the teacher education though; it is mostly that you search for yourself. We got a little tip about digital technologies in the didactics study, however.

The preference layer

The preference layer of the identity relates to what an individual prefers, routines, etc., and learning as addition or assimilation is common. Here, migrant teachers convey usage of digital technologies for information and administration that do not demand deeper processing or identity change from the user. "The teacher educators use learning management systems [or other online tools] a lot for the information and a place where we can find and send in papers." Using digital technologies, for example, LMS, information websites, and email was not experienced as problematic, but rather the opposite – it made studying easier – even though the administrative digitalisation within Swedish teacher education and how information is distributed was experienced as unfamiliar. Information about how to use online tools, however, was sometimes insufficient. "It was a new system; if you can use it, then it is a good thing. I had some problems, in the beginning, to find information or to guide myself within the system."

Regressive transformative learning

Not all of the migrant teachers experienced the use of digital technologies as something helpful and useful; some expressed negativity or scepticism regarding its use. This can happen when transformative learning goes against what a migrant teacher wants or considers important. "I think it is very bad to use of digital technologies." Digital technology was considered negative for learning and a waste of time. Furthermore, regressive transformative learning was evident when migrant teachers identified themselves as digitally illiterate, and at the same time, lacked sufficient training from Swedish teacher education. Moreover, autonomous, student-centred teaching, was rejected by some migrant teachers. "What kind of learning is that [about social learning]?" It was stressful for migrant teachers when both digital technologies and the pedagogy were unfamiliar.

Discussion

In the global educational field, migrated teachers are becoming an asset to education in their new home countries. This study aimed to understand migrant teachers' experiences when digital technologies are used in Swedish teacher education. To understand this, there was a need to investigate if migrants were educated about using digital technologies in their former teacher education, moreover their view of teaching and learning. A mixed method was used, combining different collection methods, results and analysis. This enhanced the validity and reliability since the qualitative and quantitative results supported each other. Limitations of the study connected to the web survey were present, such as the response frequency of 49%, the lengthiness of the web survey, and that it was in Swedish.

Currently, migrant teachers come to Sweden, a highly digitised society (Davidsson & Thoresson, 2017; OECD, 2018), for further education. The practice and attitudes within their work identity as professional teachers are in transformation. Earlier studies displayed that teaching students (Swedish in general) requested more education about how to teach with digital technologies (Enochsson, 2009; Demoskop, 2016) since being digitally competent is a growing demand in a digitalised society (Bautista & Ortega-Ruiz, 2015) and teachers want useable competencies. This is confirmed in the present study as well, even though digital technologies are heavily used in Swedish teacher education. Migrant teachers are not a homogenous group; the analyses showed a significant variation in the learning experienced when digital technologies were used. The use in administration, information and communication was well met. However, the connection within learning: the why what, and how they learn in

a digital environment – the pedagogical use of digital technologies – was found to be lacking.

Migrant teachers who were familiar with digital technologies in their former countries expressed the pedagogical use as student-centred, social learning, describing a genuine competence development that influenced how they taught and behaved like a teacher, reaching the personality layer of the identity. This is supported in Taylor's (2009), Illeris' (2014b) and Mezirow's (1978) description of transformative practice and was something these migrant teachers experienced in their former teacher education. Teaching and learning strategies used in Swedish teacher education, in general, are autonomous, student-active education, and social learning, among other methods, but not always when digital technologies are used. Migrant teachers who felt comfortable in the Swedish educational context could just add to what they already knew since the teaching and learning was already familiar as a work identity. Consequently, learning as addition or assimilation (Illeris, 2014b) was more common, often reaching the preference layer and sometimes the personality layer.

Migrant teachers who expressed a more extensive use of digital technologies in the Swedish teacher education programme than in the former country meant both in the amount and how and why it is used. The methods were unfamiliar to them, suggesting learning as change, and new teaching and learning strategies took up to one year to learn and use, with or without digital technologies. The learning process that facilitated self-directed learning and emphasised motivation was not familiar. This mirrored if digital technologies were important in their former society and education. Some called themselves digitally illiterate.

Interestingly, some used digital technologies for identity processing, cognitive, emotional, and social transformation. They expressed that they met many new challenges which conflicted with their former identity and practice as teachers (both in teacher education and in schools). When competence development is planned with identity and transformative learning in mind, it targets the personality layer, changing values, behaviour, and patterns of collaboration. However, when helping migrant teachers to personalise and individualise the teaching and learning, ways of teaching and learning must be assimilated since it is not something all teachers agree to use.

Closely related to learning as change is how competence is viewed, as a prerequisite for qualification, or giving one the capacity to meet the unknown. The latter is a critical component for both transformative learning and the use of digital technologies, which are each a target for continuous development into the unknown. Learning of a transformative nature, cognitively, emotionally, and socially is vital if digital technologies

will be used in teaching and learning. It is important to make transparent which opportunities migrant teachers have to reflect over transformative challenges in their professional development using digital technologies. If proper learning does not occur, regression and resignation can be the outcome instead.

Further studies concerning migrant teachers, transformative learning and identity, would make the integration process and how to design further development in education more transparent. Implications of the analysis highlight that a more diversified further development of digital technologies connected to teaching and learning must be developed. Furthermore, digital technologies can be used in teacher education at a deeper level, as an aid to identify and problematize the migrant teacher's identity and role. Lastly, migrant teachers express that it takes a lot of time to adjust to a new teaching and learning environment.

Conclusions

Coming to a new society and experiencing new learning contexts can be a considerable transition, demanding authentic competence development and transformative learning that targets the personality layer. Migrant teachers have mixed backgrounds, a diversity which concerns digital competence as well as their views about teaching and learning. It is beneficial to investigate the current digital competence of the individual migrant teacher with emphasis on what is required in the situated educational context, in addition to understanding and analysing which teaching and learning methods suit the current group – always with the migrant teachers' view of teaching and learning in mind. Lastly, it is important to plan for transformative learning, giving migrant teachers the opportunity to critically reflect over and interlink their teaching professions from the past, present, and future. This can be accomplished by using a learner-oriented, problem-based approach with critical reflection in dialogue with others, including cognitive, emotional, and social aspects. This takes time and effort; however, it will enhance digital competence. Furthermore, it is essential to understand that migrant teacher are an asset to Swedish teacher education, with pedagogical competence from different parts of the world. The exchange and learning experience is beneficial for all.

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Appendix A. Summary of Data Collection Activities

Data collection	Former teacher education in:
Survey $N = 228$ (out of 465) 49%: 12% male and 88% female University A: $n = 180$ of 380 (47%) University B: $n = 18$ of 30 (60%) University C: $n = 9$ of 15 (60%) University D: $n = 21$ of 40 (52.5%)	Algeria, Argentina, Azerbaijan, Bangladesh, Belarus, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, Central America, Chile, China, Costa Rica, Cuba, Egypt, Ethiopia, Finland, Georgia, Germany, Greece, Hungary, India, Iraq, Iran, Japan, Jordan, Kenya, Kosovo, Kurdistan, Latvia, Lebanon, Lithuania, Mongolia, Netherlands, Nicaragua, Pakistan, Palestine, Philippines, Poland, Romania, Russia, Serbia, Spain, South Africa, Syria, Taiwan, Thailand, Turkey, Ukraine, USA, Uzbekistan, Yugoslavia, Zambia
Individual interviews $N = 9$: male $n = 3$ and female $n = 6$ University A: $n = 2$ University B: $n = 4$ University C: $n = 1$ University D: $n = 2$	Hungary, Latvia, Canada, Nicaragua, Palestine, Philippines, Russia, Serbia, South Africa
Focus groups $N = 5$ groups; $N = 25$ teachers male $n = 4$ and female $n = 21$ University A: 3 groups University B: 1 group University C: 1 group	Belarus, Bulgaria, China, Estonia, Hungary, India, Iraq, Iran, Latvia, Mongolia, Peru, Poland, Philippines, Russia, Ukraine
Reflective texts (30 texts) $N = 15$ teachers male $n = 3$ and female $n = 12$ University A (all)	Balkans, Bangladesh, China, Germany, Hungary, Iraq, Iran, Kurdistan, Latvia, Lebanon, Serbia, Ukraine
In sum	**Continents:**
	Asia $n = 107$ Europe (not Sweden) $n = 95$ South America $n = 12$ Africa $n = 8$ North America $n = 3$

Notes. Value N = Total number of respondents, value n = number of respondents in a case.

Appendix B. Background data of migrant teachers

Migrant teachers	Data collection
Years of age	Quantitative: ‣ 25–31 years, $n = 36$ ‣ 32–38 years, $n = 80$ ‣ 39–45 years, $n = 56$ ‣ more than 45 years, $n = 50$ Qualitative: the same span
Years of former teacher education	Quantitative: ‣ 2 years, $n = 36$ ‣ 3–4 years, $n = 96$ ‣ more than 5 years, $n = 79$ ‣ graduate students, $n = 8$ Qualitative: the same span
Specialisations (The migrant teachers could tick more than one box for specialisation in the web-survey.)	Quantitative: ‣ Upper secondary school, n = 129 ‣ Secondary school, n = 110 ‣ Middle school, n = 79 ‣ Primary school, n = 51 ‣ Preschool, n = 18 ‣ Special education, n = 8 ‣ Recreation centre, n = 1 ‣ Other types of specializations, n = 25 Qualitative: the same, except recreation centre n = 0
Subject areas	‣ Quantitative data: social science, nature science, language, mathematics, art, music, special education, preschool, gymnastics and sports and health, recreation centres, country-specific ‣ Qualitative data: social science, nature science, special education, gymnastics, sports and health, language (English, French, Russian, some Mother's tongue), literature, mathematics, art, music, computers and technology, psychology, country-specific

Appendix C. Teaching philosophy – numbers and % from the web survey

Questions in the survey	N =	Strongly disagree/ Disagree	Neither agree nor disagree	Agree/ Strongly Agree
1. Students shall be active, decide what and how they shall learn something	N = 219	n = 16 8%	n = 56 26%	n = 147 67%
2. Education shall be directed by the teacher	N = 217	n = 27 12%	n = 74 34%	n = 116 54%
3. I see myself as an intermediary of facts and information	N = 213	n = 47 22%	n = 46 22%	n = 120 56%
4. Students learn the most when schools emphasize hard work, respect and discipline	N = 216	n = 60 28%	n = 61 28%	n = 95 44%
5. I am mainly a mentor who helps the students	N = 218	n = 14 6%	n = 27 12%	n = 177 81%
6. Students are passive and must be controlled so that learning can occur	N = 213	n = 98 46%	n = 55 26%	n = 60 28%
7. Teaching shall be adapted individually to each student	N = 218	n = 17 8%	n = 32 15%	n = 169 78%
8. I am mainly a subject expert who shall give the students subject competence	N = 216	n = 27 12%	n = 53 25%	n = 136 63%
9. The students need to be motivated to want to learn something	N = 218	n = 5 2%	n = 8 4%	n = 205 94%
10. I must train the students' social skills	N = 218	n = 12 6%	n = 30 14%	n = 176 81%
11. The individual school and society outside shall have a close working relationship	N = 216	n = 11 5%	n = 26 12%	n = 179 83%
12. Education shall be the same in all schools and not vary between different teachers	N = 216	n = 42 19%	n = 51 24%	n = 123 57%
13. Students are responsible and independent	N = 218	n = 23 11%	n = 72 33%	n = 123 57%
14. I shall train the students to be independent individuals	N = 216	n = 14 6%	n = 24 11%	n = 178 82%
15. Teaching shall relate to life outside of school	N = 217	n = 7 3%	n = 20 9%	n = 190 88%
16. Students learn most when they work together	N = 217	n = 12 5%	n = 41 19%	n = 164 75%
17. Teaching shall build on students' earlier experiences	N = 215	n = 12 6%	n = 29 13%	n = 174 81%

Questions in the survey	$N =$	Strongly disagree/ Disagree	Neither agree nor disagree	Agree/ Strongly Agree
18. I must create an encouraging atmosphere which promotes the students' development	$N = 217$	$n = 2$ 1%	$n = 9$ 4%	$n = 206$ 95%
19. Teaching shall be aligned with the students' understanding	$N = 218$	$n = 3$ 1%	$n = 6$ 3%	$n = 209$ 96%
20. I shall take care of and cherish the students	$N = 216$	$n = 18$ 8%	$n = 58$ 27%	$n = 140$ 65%
21. The focus shall be on the teaching process and not the end product	$N = 216$	$n = 26$ 12%	$n = 57$ 26%	$n = 133$ 62%
22. Information technology must be integrated in teaching	$N = 218$	$n = 7$ 3%	$n = 33$ 15%	$n = 178$ 82%
23. I would rather work in a team than alone	$N = 218$	$n = 21$ 10%	$n = 55$ 25%	$n = 142$ 65%

DIGITALIZATION AS A PROCESS OF ASSISTANCE IN THE TRANSPARENCY OF UNIVERSITY TEACHING

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ABSTRACT

This is a project with objectives to study and to apply the surface of the hardware and software part of the panel with LED diode lamps. Much more is focused on the programming of LED matrix diodes located on 16×96 electronic panels, respectively 16 rows of 96 columns. Also, there is elaborated the study of the mode of operation, composition, coding and use of software for panel diodes. In the focus of all this is the introduction of diode panels in use at "Kadri Zeka" University exactly at the Faculty of Computer Science to provide digital information to students, professors or anyone passing through the premises of the university what is happening inside the classrooms of the Faculty of Computer Science. This happens in real time in accordance with the schedule of lectures and exercises in the respective classrooms of the FCS. In fact, this project explains in detail the concept of LED diodes and microcontrollers, their features, operation, power supply and work with 0 [VDC] and 5 [VDC] voltages, respectively 0 and 1 logic bits. Meanwhile, the project also explains how coding, software building that locks, and unlocks LED diodes on a 96×16 LED diode panel, thereby producing text on the panel (display, screen) in static, mobile, animation or up-down, left and right movements according to the time allocated to the timers of the microcontrollers. Such action achieves the goal of the digitalization project of the classrooms of the Faculty of Computer Science.

Keywords: LED diodes, light-emitting diode panels, digitization, microcontrollers, memory, microprocessors, programming codes, software.

Introduction

While having lessons in different classes at University "Kadri Zeka", it happened so often to interrupt from the outside from students and professors who had opened the door in order to see if it is free for studying. Such a behavior even without intention of students and professors, irritated the rest of the people who were studying inside the classroom. Therefor, we as a group of professors of this university have analyzed the problem and came to the solution such this digitalization. With this solution has passed the problem of interruption and now all the students and professors are studying without interruption from outside, first in all the classrooms of Faculty of Computer Science in University "Kadri Zeka".

Materials and metods

In order to get rid of those problems with interruptions during the studying process are held a long discussions, consulting, meetings between students, professors, administrative staff of Faculty of Computer Science and meetings with working groups of students and professors.

Within the working group of students and professors were also the authors of this paper and also the dean of the faculty. After the all discussions it was concluded that the problem can be solved with panels of diodes of size 96 x 16 above the entrance doors of each classroom, and the programming of them dynamically also at the real-time according to scheduling timetable for lessons, and the updates of the panels will eliminate the problems of disturbing while opening the doors of classrooms at the critical time while the lessons are held. In the continuation we will exploire and describe the programming of LED matrix diodes located on 16×96 electronic panels, respectively 16 rows of 96 columns. Also, there is elaborated the study of the mode of operation, composition, coding and use of software for panel diodes. In the focus of all this is the introduction of diode panels in use at "Kadri Zeka" University to provide digital information to students, professors or anyone passing through the premises of the university.

Characteristics of LED Matrix Panel

The panel that is the object of study and review is not the most qualitative in the market, but performs the function for which it is explored, and any other model works according to the same principles.
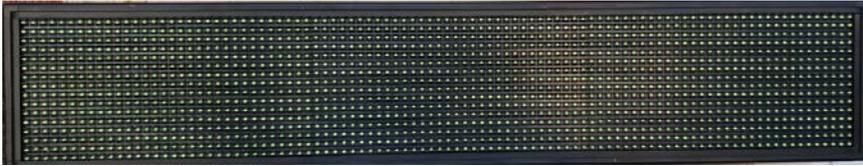
Figure 1. LED display 96×16 with unlit LED diodes (switch off)
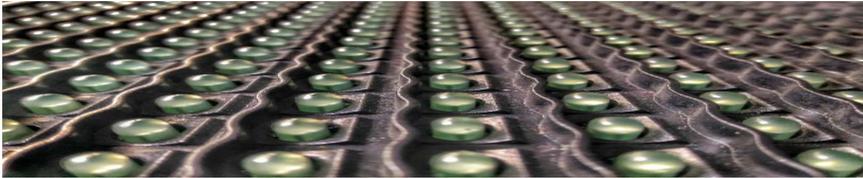
Figure 2. LED panel diodes 96×16
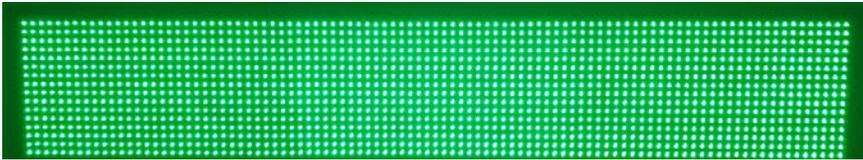
Figure 3. LED Matrix 96×16 Panel with LED Diodes (switched on)

Figure 4. Panel Microcontroller and electronic Card Model HD-E65 for LED Diodes of Panel 96×16
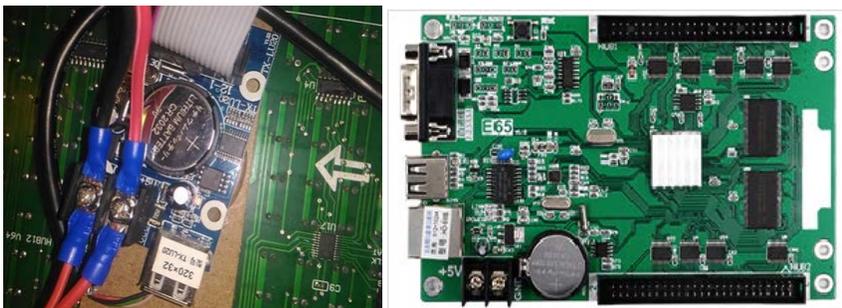
Figure 5. Led Panel 96×16 diodes and information about what is currently happening in the room B24 FSHK's

Figure 6. Two panels connected physically and present the inscription of the University

Figure 7. Moving text, digital day and time

Table 1. Characteristics of LED panel 96×16 diodes (from Pond, R. J. and Rankinen J. L, 2008)

Model	HD – E65
Chip type	Supports only green color
Distance between LEDs	10 [mm]
Supply voltage and electricity	5 [V] 40 [A]
Luminance	$\geq$ 7500 cd/m^2 (for outdoor)
Light module format	32 × 16 LED
LED number for module	512 LED
Panel Dimensions	110 × 10 × 22 [cm]
The amount of power consumption	20 [W] – 40 [W]
Number of modules	3
Angle of view	120° horizontal, 60° vertical
Working temperature	-20 [°C] $\sim$ + 60 [°C]
Supply to the city's electrical network	Alternative electricity 100 $\sim$ 240 [VAC]
LED diodes for panel	96 × 16 LED
Total number of LEDs on the panel	1536 LED

ML 96 x 16 R (model: HD E-65) and Led Diodes

The digital display is able to emit static text, moving, displacement, animation, cyclic, scroll, slug, blinker, that text moves from left to right, from right to left, bottom-up, top-down or similar movements. Show the correct time, date, temperature and even one or more rows depending on the number of diodes according to the lines of the display.

Relatively with high resolution (from Pond, R. J. and Rankinen, J. L, 2008). 24 types of animations can be selected for text you can adjust the speed of the text movement. The possibility of the timer display option that automatically activates or deactivates the device programs within certain time intervals. In the computer is formed a text, the module is programmed and it can be stored and then transferred to USB connected to the appropriate port of the diode panel and transferred as text on the display.

The text on the digital display is easily programmed through software that works in the Windows operating system. The system recognizes and can perform with different types of fonts that are used on the Windows operating system (from Pond, R. J. and Rankinen, J. L., 2008). The LED panel programming is performed through the respective software installed on the personal computer and transferring the program through USB port with USB memory, via RF or Wi-Fi technologies (from Pond, R. J. and Rankinen, J. L., 2008)!

Digit: **ML96×16R; HD2016 LED Display Controller; Card Model: HD E-65**

Figure 8. Incription display using LED green diodes

Illuminating Diode (LED)

LED is the abbreviation of English words "*light-emitting diode*", that is, a light-emitting diode. The illuminating diode is built in the same way as the usual semiconductor diode. It will work if it is polarized on the right side. The intensity of the light is regulated by the current which flows through the diode also exponentially.

The diode will not emit light when it is polarized in the opposite direction (Milman-Halicias, 1972; SK Bhattachary, 2000).

The color of the light emitted depends on the type of semiconductor and the added impurities.

The diode produced by *gallium phosphate* (GaP) emits red light while that of gallium arsenide phosphate can emit light green or yellow (Milman-Halicias, 1972; SK Bhattachary, 2000).

The graphic symbol and characteristics of the light-emitting diode are shown in Figure 9 as follows:
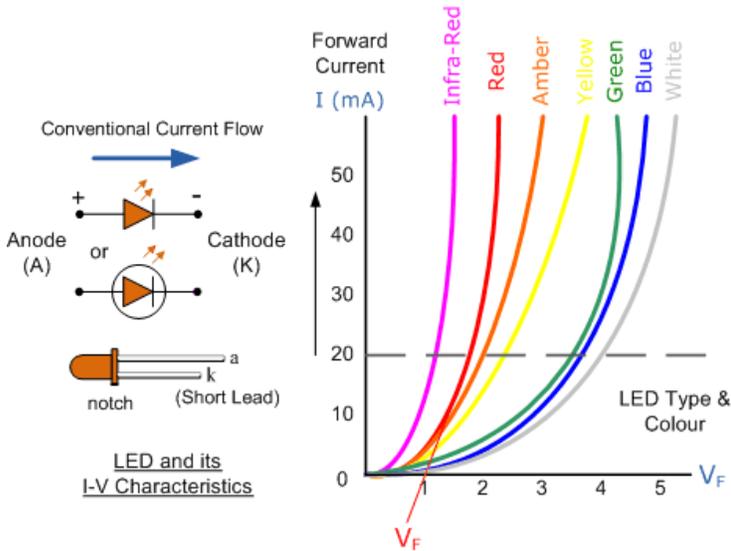
Figure 9. Characteristics of LED diodes (D. Hearn, M. Pauline Baker, 2004)

The advantages of light-emitting diodes are:
- small size
- safety at work
- long term service
- work with low tensions and currents
- small losses of electricity
- great work speed.

Usability

LED Light-emitting diode are used for signaling, through which the open or closed status of an electronic circuit is indicated. Especially they are implemented in bright light indicators (Philip Burgess, 2016; D. Hearn, M. Pauline Baker, 2004). LED diodes look like in figure10:
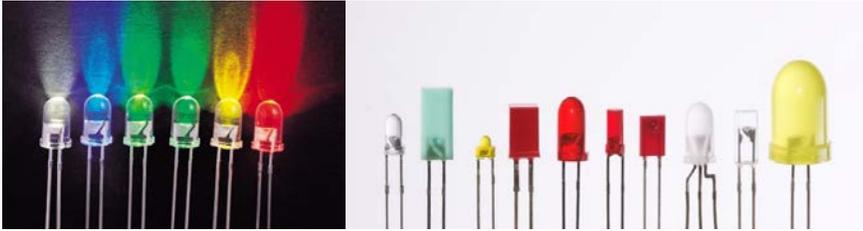
Figure 10. Types of LED light-emitting diodes by color enlightening

Blue **light** emits LED diodes in the electromagnetic waveband from 450 to 500 [nm] – (nanometers).

Green **light** emits LED diodes in the electromagnetic waveband from 500 to 600 [nm] – (nanometers).

Red light emits Led diode in the electromagnetic waveband from 600 to 690 [nm] – (nanometers).

At the moment of power supply of LED diodes with semiconductor material content of gallium arsenide phosphate and its positive polarization leads to electron bulging causing the production of light waves in the range of 550 to 640 [nm]. Breaking light on the conic lenses of the observer's eye (human) creates a sense of perception of the green color according to the spectrum of the colors of the light waves (Philip Burgess, 2016; D. Hearn, M. Pauline Baker, 2004). In other cases, semiconductor material and semiconductor diodes will produce light beams at other intervals of the wavelength and creates a sense of perception of the respective color, always according to electromagnetic spectrum ranges of electromagnetic wavelengths as shown in Figure 11.
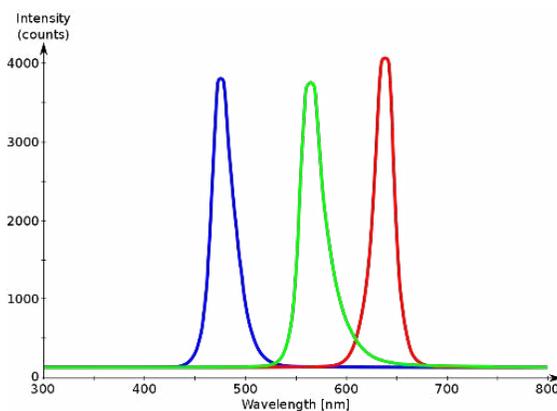
Figure 11. RGB base color spectrum acquired by the length range of the light beam (electromagnetic wave) (D. Hearn, M. Pauline Baker, 2004)

Lightining Diode (LED)

LEDs are special diodes that emit light when connected to an electrical circuit. They are often used as a pilot lamp in electronic applications to show when the circuit is running or not (Milman-Halicias, 1972). In a right polarized diode, free electrons pass the union of p-n contact and become conductive. If these electrons pass from a higher energy level to a lower power level, they generate energy.

In ordinary diodes like Silicium (Si) or Ge (Germanium), most of this energy goes in the form of warmth. In other materials such as gallium (Ga), Arsenic (As) and Phosphorus (P) or Gallium-Phosphorus (GaP), the number of photons of light is sufficient to create a visible light source. In light emitting diodes, this energy radiates as light.

The most important part of an LED is a semiconductor chip placed in the center of the lamp. The chip has two layers: the **p** layer has mainly positive electrical loads and the layer **n** with negative electrical loads. When a sufficient voltage is applied to the diode, the electrons can flow easily in one direction to the **p** and **n** layer contacts.

So it starts to flow the current, because layer electrons **n** has enough energy to move to the **p** layer (Milman-Halicias, 1972).

When an electron moves and falls on a positive load, both loads are recombined, so when an electron hits a hole, it falls to a lower level of energy and emits energy in the form of a photon.

Whenever an electron is recombined with a positive load, the potential electric energy is transformed into electromagnetic energy (Milman-Halicias, 1972).

Graphic symbol of enlightening diodes is given in Figure 12.
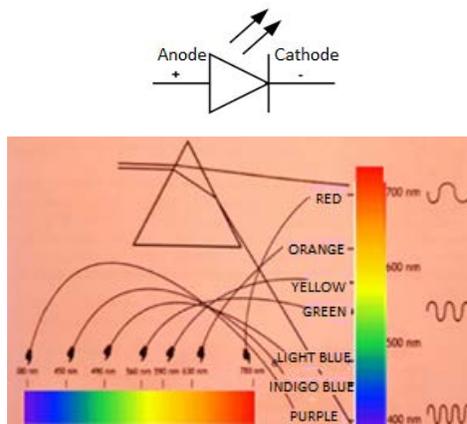
Figure 12. Graphic symbol of LED light-emitting diodes (Robert J. Pond, Jeffrey L. Rankinen, 2008)

Figure 13 shows how a LED diode connects to an electrical circuit.

(a)Skemë e thjeshtë meLED.
(b) Display me 7 segmente me LED
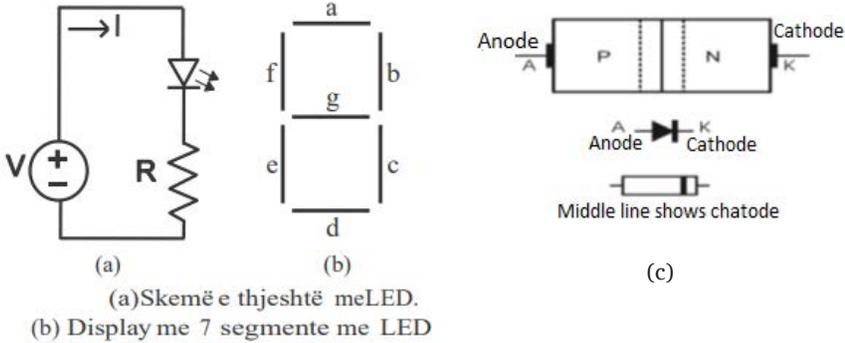
Figure 13. Electrical scheme of a LED diode and the p-n contact
(Milman-Halicias, 1972)

a) the electric polarization circuit of straight LED illuminating diodes
b) 7 segment LED display.
c) p-n contact with cathode and anode of the semiconductor diode.

A seven segment display contains seven LED diodes. Each LED diode is called a segment. In figure (a) there is shown a segment of a 7-segment display as well as the series-related resistors used to limit the current value of the diode and its protection. Given the supply voltage of LED diodes from 0 to 5 [VDC] and the permissible current from 0 to 20 [mA], the LED diodes are connected to serial-resistor whose resistance is calculated according to the Omit Law:

$$I = \frac{U}{R} \text{ respectively: } R = \frac{U}{I}$$

Example: For supply of 5 [VDC] voltage to LED diodes and a 10.63 [mA] current flow permissible within the range of {0–20 [mA]}, according to the Omit Law, calculate the required resistance of the resistor needed to connect to the diode in series:

$$R = \frac{U}{I} = \frac{5\,[VDC]}{10,63\,[mA]} = 470\,[\Omega]$$

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Some of the LED uses in everyday life are:

- architectural lighting
- indicators (condition indicators) in many electronic devices
- traffic signals and road signs
- handheld flashlight
- remote controls thanks to the infrared LED
- optical fiber for traffic
- for Christmas tree lights
- LED anti-acne phototherapy has been effective in the disappearance of acne for a 3-month period,
- lighting panels and other textual descriptions.

Disadvantages of LED usage: LEDs are more expensive currently than other lighting technologies. LED performance generally depends on the ambient temperature in which it works. By operating the LED at high ambient temperatures, this may result in overheating of the diode and lead to damage (drilling effect) and to malfunction.

Microcontrollers

The microcontroller contains microprocessor, memory and a large number of peripheral devices such as timers (timer relays), serial ports, input / output pin terminals, numerators, analog inputs and so on (Warwick Smith, 2016). All of these are within a silicon circuit in the form of a built-in system.

Examples of built-in systems are: calculators, computers, and smart phones. The 8x8 LED diode panel and the programming code for their connection are defined in Appendix A.

The microcontroller system architecture has changed from time to time, but what is left behind is the programming language C (Warwick Smith, 2016).

The programming language consists of alphanumeric characters, syntax of commands, functions which constitute a program code comprehensible to man, respectively the programmer.

On the other hand, the execution of the programming code on the computer is performed when the program code is compiled in the machine language. This implies that each alphanumeric sign of the programming code is converted to the binary code (0 and 1 logic) according to the international agreement the ASCII table or the extended EBDCIC table (Warwick Smith, 2016). This, in effect, represents the string of square time voltages of the lowest level 0 [VDC] and highest 5 [VDC] respectively.

Meanwhile, 5 [VDC] voltage supplies LED light-emitting diodes, which causes LED diode brightness, while 0 [VDC] voltage fails to arouse the illumination of LED diodes (Warwick Smith, 2016).

All input data are placed in the microcontroller memory. From the microcontroller memory, the input data is processed in the micro-processor for processing and the results obtained according to the respective software or programming code are stored in the memory and transmitted to the respective ports of peripheral devices and in this case the 96 × 16 diode panel where diodes are placed within an electronic plate (Warwick Smith, 2016).

If the microcontroller memory inserts the letter B and the voltmeter (voltage measuring instrument) it will be possible to measure the voltages of each bit in turn we will show the voltage measurements as in the following figure 14:

0 [v], 5 [v], 0 [v], 0 [v], 0 [v], 0 [v], 5 [v], 0 [v],   which in fact represents binary number:

0   1   0   0   0   0   1   0 .
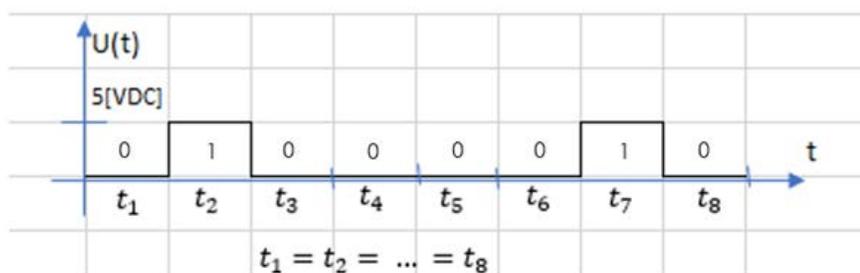
Figure 14. Chart tensions 0 [VDC] 5 [VDC], presentation by binary numbers 1 and 0 logic

Presentation of binary digit 1 with voltage of 5 [VDC] or any other value depends on the technical characteristics and electronic components of the microcontroller system. 8-bit array: belongs to the decade number because: $(01000010)_2 = 0 \cdot 2^0 + 1 \cdot 2^1 + 0 \cdot 2^2 + 0 \cdot 2^3 + 0 \cdot 2^4 + 0 \cdot 2^5 + 1 \cdot 2^6 + 0 \cdot 2^7 = 2 + 64 = 66 = (66)_{10}$ viewed at the ASCII – code table, this belongs to letter B.

Why to work with binary numbers?

Programming of built-in electronics such as microcontrollers consists of communication with hardware devices that are related to the microcontroller, as well as the devices located in the microcontroller itself (memory, processor, timer and other stuff) (Warwick Smith, 2016).

Let us consider the microcontroller to the output are connected four light-beam diodes as shown in Figure 15.
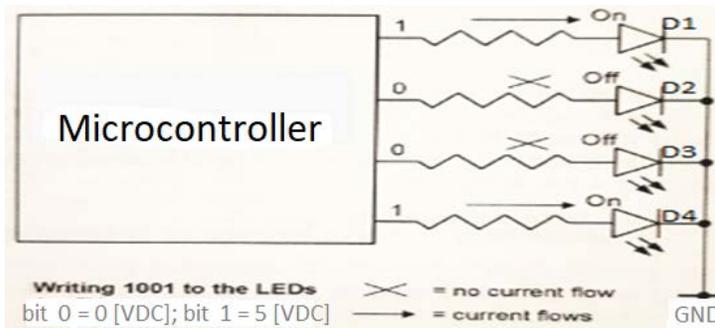
Figure 15. Logic circuit, how the diodes are turned on by the microcontroller (Warwick Smith, *2016)*

To connect the LEDs D1 and D4 to the LED diode, these LEDs will be able to transfer binary digits 1 0 0 1. As binary numbers are archived in the form of voltage levels. Indeed, we connect the 5 [VDC] voltage to anode of the diode D1, 0 [VDC] to anode of the diode D2, 0 [VDC] to anode of the diode D3 and 5 [VDC] to anode of the D4 diode. In this case, the LEDs D1 and D4 will illuminate while the LEDs D2 and D3 will not illuminate.

Memories

In microcontrollers and built-in systems there are two types of memories, called ROM and RAM (Warwick Smith, 2016).

ROM memory – This type of memory is used to archive the program that is written and compiled. This is a durable memory and that even when power supply disconnects does not lose its content (Warwick Smith, 2016).

RAM memory – Memory RAM is used to store variables and data from the microcontroller work program. Data and variables can also be changed during the work of the program.

This type of memory is not stable which means that with the termination of the power supply its content are lost or deleted at all. SDRAM SRAM and EPROM memory are often used for memory expansion (Warwick Smith, 2016).

Archiving of data in memory

The data in the memory is placed in the form of a byte sequence. Each byte possesses its unique address and can be addressed as in Table 2. Data in the memory can be recorded and read.

Bit positions in a memory address from 0 to 7 of a byte!

Table 2. Presentation of data storage (bytes) in memory

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Address 0	1	0	1	0	1	0	1	0
Address 1	0	0	1	1	0	1	0	1
Address 2	1	1	1	1	1	0	1	1
Address 3	1	0	0	0	0	1	0	0
Address ...	...	...	...	...	...	...	...	...
Address n	...	...	...	...	...	...	...	...

1 Byte of data   Each cell can store bit of value 0 or 1

Appearance of the circuit (chip) memory

In addition to ROMs of RAM, many types of microcontrollers also have an additional data storage memory called SRAM (Warwick Smith, 2016).

Figure 16 shows an SRAM with a capacity of 2 kB (kiloBytes). Each memory byte is called a cell and may contain logical levels respectively logic bits 0 and 1.

A7	1	VDD
A6	2	A8
A5	3	A9
A4	4	WE
A3	5	OE
A2	6	A10
A1	7	CS
A0	8	D7
D0	9	D6
D1	10	D5
D2	11	D4
GND	12	D3
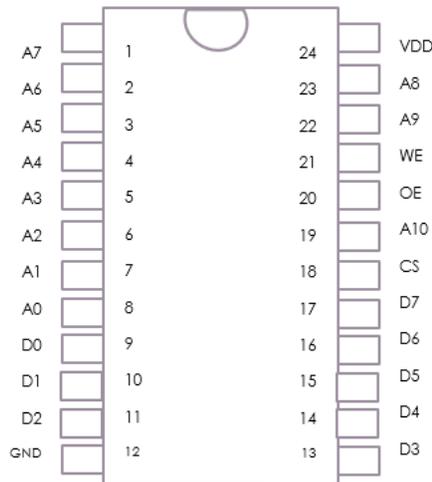
Figure 16. Memory circuit, 8-bit S-RAM

VDD and GND:	power supply to chip
A0 to A10:	Address bus – data byte address placed here
D0 to D7:	Data bus – 8 bit data byte read and written here
CS:	Chip select
OE:	Output enable
WE:	Write enable

} Control bus

Microprocessor access to memory and peripheral devices

The microprocessor contains Address Bus, the Data Bus, and the Control Bus. The memory connection with the processor is performed through the respective buses of the two main microcontroller devices (Warwick Smith, 2016). When the microprocessor is supplied with power its counter is set to 0. If the permanent memory (RAM) that contains the program is connected through the microprocessor circuit, the microprocessor will receive the first instruction (instruction is a binary number) of the programming code and executes it. The microprocessor program counter increases for one and receives the next programming instruction at address 1 of the memory and executes it. The microprocessor counter continues to increase for one by enabling execution of the codebook instructions to the latest programming instruction as in Figure 17.
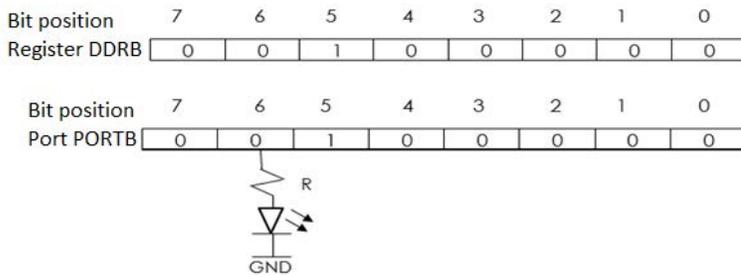
```
int main(void)
{
        DDRB = 0x20;        // set bit 5 of DDR register which makes PB5 an output
        while(1)
        {
                PORTB = 0x20;      // swich LED on
                Delay();
                PORTB = 0x0;       // swich LED off
                Delay();
        }
}
void Delay(void)
{
volatile unsigned long count = 100000;
while (count--);
}
```

Figure 17. Connecting microprocessor with memory and peripheral devices

Pins and ports of microcontroller

Microcontrollers possess a relatively large number of pins known as input / output pins (I / O – Input / Output) of general implementation.

Pints are defined as outputs serving to connect the microcontroller output connections as in the present case for switching and disconnection of LED lighting diodes as well as input pins for reading logic levels 0 or 1 located in the microcontroller pin (Warwick Smith, 2016). 8-bit microcontrollers possess 8-bits ports that represent pin I / O groups labeled as ports A (PORTA), B (PORTB), C (PORTC), and so on.

Switching on and switching off the LED light-emitting diodes in the electronic board

When the built-in microcontroller system is connected, all of its pins are initially defined as inputs. To switch on or off LED light-emitting diodes placed on an electronic board, we need to set or describe the values in the respective data entry port (DDR – Data Migration Data Logger). Therefore, for access to Port A, the DDRA register is used, Port B is used for DDRB and so on, where LED diodes are connected (Warwick Smith, 2016). Figure 18 shows the memory registers that are required for the control of LED lighting diodes on the Arduino Uno electronic board, which also applies to other microcontrollers wherever they are placed on the electronic board.
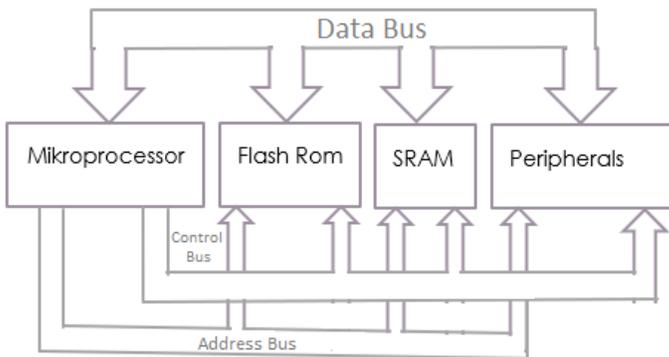
Figure 18. Memory registers in Arduino Uno (Warwick Smith, 2016)

In the pin with index number 5 (PB5) of the plate (Arduino Uno) is connected the LED Led Illumination. If the bit with position 5 of DDRB is described or transmitted logical energy level or be 1 then port B ordinal number 5 (PB5) is set as PIN DOWN.

The hexadecimal number to be described in this case in the register is: (20) 16 or 0×20, in which case the LED will be illuminated. Therefore, if logic or beam 1 is described in the register, this is the fact that the LED diode is supplied with a voltage of 5 [VDC] which will switch off its illumination.

The binary number in the register (00100000) 2 is converted to the hexadecimal as follows:

$$(00100000)_2 = (0010\ 0000)_2$$
$$(0010)_2 = 0 \cdot 2^0 + 1 \cdot 2^1 + 0 \cdot 2^2 + 0 \cdot 2^3 = 2$$
$$(0000)_2 = 0 \cdot 2^0 + 0 \cdot 2^1 + 0 \cdot 2^2 + 0 \cdot 2^3 = 0$$

Therefore, the hexadecimal number is: $(20)_{16}$! This happens with the best intention that data in programming language C are written in hexadecimal format rather than binary format! The programming code example C in the programming language C for diode input is defined as follows:

The result of this programming code in the programming language C is that in the electronic board where LED diode is connected, the same to switch it on or off the LED diode to pulsate by switching on and off at a high frequency!

The file: io.h located at the beginning of the program code enables the registry to be accessible for access. Setting logic 1 to the set bit position in the DDRB registry creates the corresponding pin declaration option as OUTPUT PIN on the PORTB port.

In the loop while (1) the PORTB register is set to enable the LED diode to light up, provided that the corresponding bit in the log has the logical value 1, the same bit is again set but in logical value 0 in order to switch off the LED diode light. Calling the Delay () function between the LED diode switch on ensures that the LED diode remains in the turned on state and turned off enough at a high frequency so that it is visible to the human eye, creating the impression of the constant illumination.

With the while (count) command is reached that the program cycle is repeated whenever the counter count = 100000 decreases for one to the 0 value when also the command while (count--) gets the false value. This actually determines the timing of the LED dialing switch disconnection. At the end of this time according to volatile unsigned long count counter (100000) the program comes out of the cycle and completes its work.

Array

Programming language C are successive memory locations that archive specific type of data. For example, the programming string C, consisting of 5 integers (Warwick Smith, 2016), is defined as follows:

int arr_num[5];   or   unsigned char seq[ ];

Through the definition of the arrays, it is easy to switch on and off LED light diodes placed on an electronic board (LED DIODE PANEL)! The following programming code initiates the array through a set of numbers that are described on the LED for their switch on and off. Such array is known as a reference table.

Connecting four LED diodes to the pin terminals of PC0, PC1, PC2 and PC3 microcontrollers is explained in the same way as before (Warwick Smith, 2016)! The values in the full-range string are the values that are described (placed) on the microcontroller output port for LED light-disconnection and disconnection.

The array of the given numbers is 1, 2, 4, 8, 6, 9, 15, 5, 10, 5, 10. One-dimensional array numbers should be converted to hexadecimal format so that they are read in the file. The programming code for this case of four LED diodes is defined as follows:

```
#define F_CPU 16000000UL
#include <avr/io.h>
#include <util/delay.h>
int main(void)
{
        unsigned char seq[ ] = {0x01, 0x02, 0x04, 0x08, 0x06,
                            0x09, 0x0F, 0x05, 0x0A, 0x05, 0x0A};
        int ind;
        DDRC = 0x0F;                    // lower 4 bits of port C are outputs
        while(1)  {
                for (ind = 0; ind < sizeof(seq); ind++) {
                        PORTC = seq[ind];
                        _delay_ms(1000);
                }
        }
}
```

The result of this program code looks like in Figure 19.
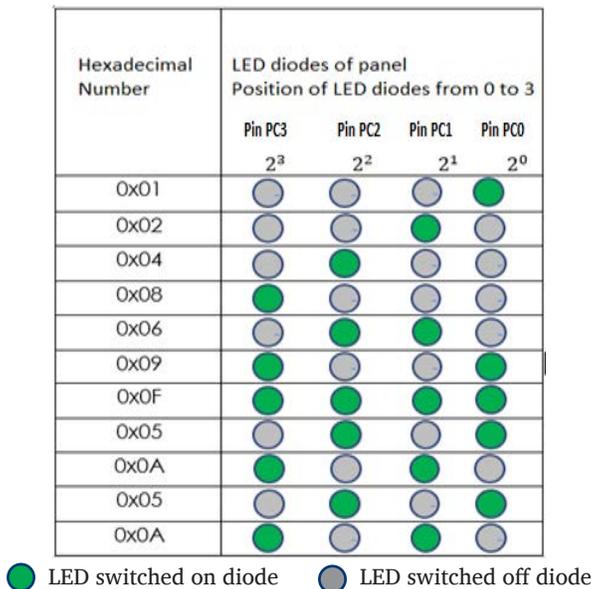
Figure 19. LED diode connection according to matrix programming code (Warwick Smith, 2016)

After defining the array and defining the variable that should be used as an index on the array elements, the C port will be tuned for connecting the four diodes to the corresponding pin PC0, PC1, PC2 and PC3 before it is put into operation while(1).

If you want to present the letter F in a display panel with 12 rows and 4 LED diode columns as shown in Figure 20, write the program code in C as follows:

```c
#define F_CPU 16000000UL
#include <avr/io.h>
#include <util/delay.h>
int main(void)
{
        unsigned char seq[ ] = {0x0F, 0x08, 0x08, 0x08, 0x08, 0x08
                                0x0E, 0x08, 0x08, 0x08, 0x08, 0x08};
        int ind;
        DDRC = 0x0F;                 // lower 4 bits of port C are outputs
        while(1)  {
                for (ind = 0; ind < sizeof(seq); ind++) {
                        PORTC = seq[ind];
                        _delay_ms(1000);
                }
        }
}
```


Hexadecimal Number	LED diodes of panel Position of LED diodes from 0 to 3			
	Pin PC3 2^3	Pin PC2 2^2	Pin PC1 2^1	Pin PC0 2^0
0x0F	●	●	●	●
0x08	●	○	○	○
0x08	●	○	○	○
0x08	●	○	○	○
0x08	●	○	○	○
0x08	●	○	○	○
0x0E	●	●	●	○
0x08	●	○	○	○
0x08	●	○	○	○
0x08	●	○	○	○
0x08	●	○	○	○
0x08	●	○	○	○

Figure 20. The LED lighting diodes forming the letter F

The HD-E65 LED panel software, consisting of 96 LED diode arrays and 16 rows also LED diodes (96×16) known as: HD2016
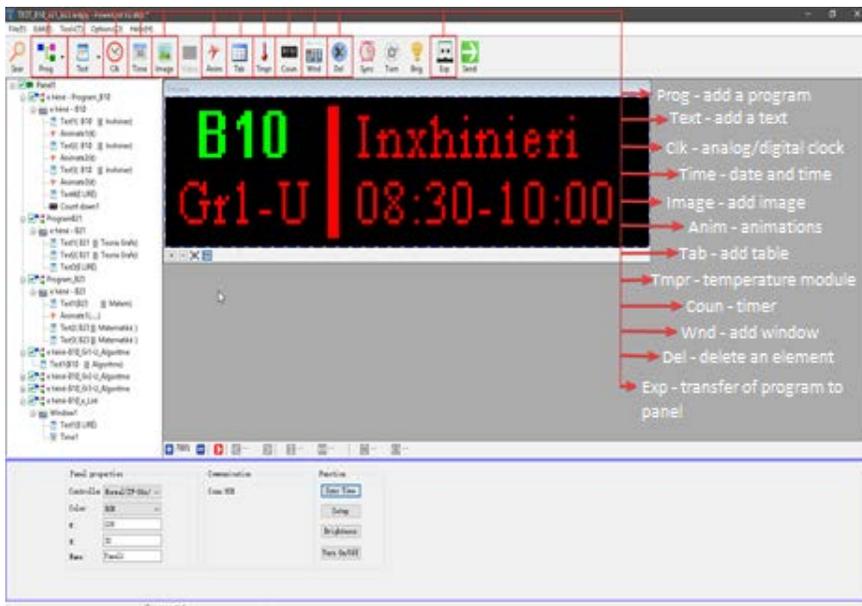
Figure 21. The look of the PowerLed 96×16 Test software

PowerLed is a software used for programming RGB matrix panels, it contains a collection of tools that can be used to program different panels (from manual HD2016_Operation_ manual_ V1.0).

PowerLed consists of:
- Menu bar
- Toolbar
- Window class
- Virtual Panel Window
- Feature Window

For the programming of the LED panel, in special cases the Software is used which is dedicated to 160×32 panels (160 columns with diodes and 32 rows) model:
- HD2016
- Module HD – E65
- Screen Size: 160×32
- Color: Single color
- Communication: Com port, U disc, Ethernet
- Memory: 2M

LED module panel diode 96×16 by the programming software is treated as a matrix of elements set in 16 rows of 96 columns, whose elements are

the addresses of LED diodes placed in rows and panel columns. Meanwhile, the positioning of the text appearing on the LED panel display is also treated as a plane coordinate system (x, y) oriented towards the x axis and y as in Figure 22.
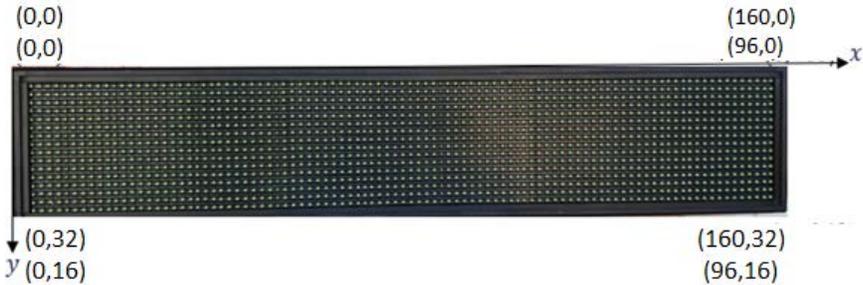
Figure 22. Coordinates of the LED panel 96×16 in the direction of the axis (x, y) respectively LED panel 160×32

Therefore, for panel programming, we need to consider which software is available for use.

When programming a LED panel with a 96×16 LED diode via a software module for 160×32 LED diode panels, it is necessary to determine the start of the software co-ordinate system so that we can set the text at the top of the panel from left to right (from Pond, R. J. and Rankinen, J. L, 2008).

Otherwise, we will not be able to see the desired text because the placement of the text will remain defined outside the positive (real) coordinates of the coordinate system (from Pond, R. J. and Rankinen, J. L, 2008).

For this case, if the software is designed for 160 columns of 32 rows, then in the extension of the x-axis, move right to: 160 – 96 = 64 positions, which will be considered the point (0.0) for the 96-column panel and 16 rows! This is done in the window part as in Figure 23 as follows. Of course this is achieved by selecting the menus as follows: screen1 / program1 / text1 and window displacement for 64 points in the positive direction of the x axis, while in the direction of y axis only half of the field is transmitted because: 32 : 2 = 16!

Figure 23 shows coordinating the LED array 96 × 16 coordinates via the 160 × 32 diode software
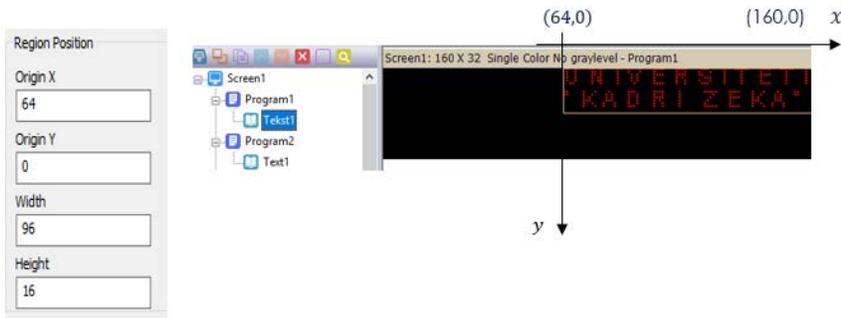
Figure 23. Allocation coordinates of LED panel diode 96×16 160×32 through software diodes

The rest of the use of the software whether it is designed for 96×16 and that for the 160×32 LED diodes is indistinguishable in essence. Through programming software for LED panels, it is possible to program up to 1000 programs in a screen so that in each program they can be divided up into 20 different areas (from Pond, R. J. and Rankinen J. L, 2008).

However, the programming software for LED panels can also be granted to whom will their module be as follows:

The File / New Screen menu is selected and in the open window the password or password 168 is set (according to the manufacturer's recommendations, implied) and in the next window are set the parameters that correspond to the panel LED available to us after setting parameters and confirming they do not need to be maneuvered in coordinating the coordinates. After this tuning, the plane coordinates (x, y) look like as in Figure 24.
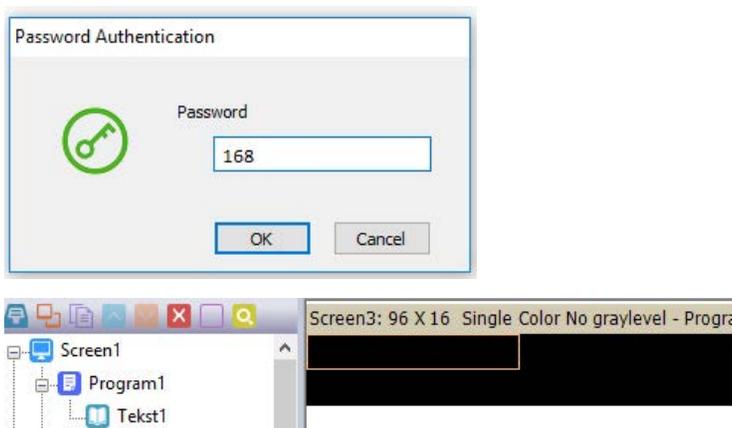
Figure 24. Synchronization windows – adjusting the programming software with the LED panel model that we have available

Origin X

0

Origin Y

0

Width

48

Height

8

If we look at the display window where the coordinate values of the axis x and y are set (Screen1 / program1 / text1) in this case, the width is 48 while the height 8 means that the software enables four fields to move the text. The mouse can easily capture and release the edges of the 48X8 frame until the 96X16 screen size is reached to write in a single full 96X16 diode screen area as shown in Figure 25.

Figure 25. The window obtained with coordinates of origin according to axis boshtit (the width of the display field) and (the height of the display field)

Screen respectively LED display with 96×16 enlightening diodes and distribution of pixels according to the axis x and y appears as in Figure 26.

(0,0)   (96,0)   x

(0,16)   (96,16)

y
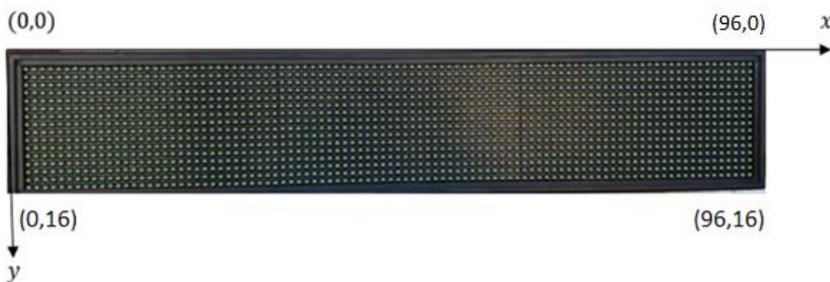
Figure 26. Screen respectively LED display with 96×16 enlightening diodes as well as pixel distribution by axis x and y

Menu bar

The software for programming LED Panels contains menus by which we work and manipulate with PowerLed. With this software you can choose text with a great opportunity of using different fonts, setting the analogue but also the digital clock, adjusting the time of text display on the screen, full programming according to a time period for one or more days, weeks, months and so for several years.

Meanwhile, a temperature thermometer (**Type: AM2301**) can be set for temperature measurement. The LED panel, according to the software, can also be used for numbering by increasing or decreasing number, as a device can be used for the numbering of vacancies in a smart auto parking.

Next, some programming methods will be displayed according to the menus defined by the programming software.
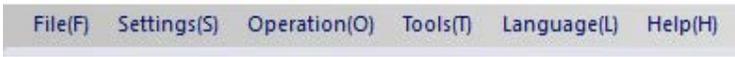
Figure 27. Menu bar
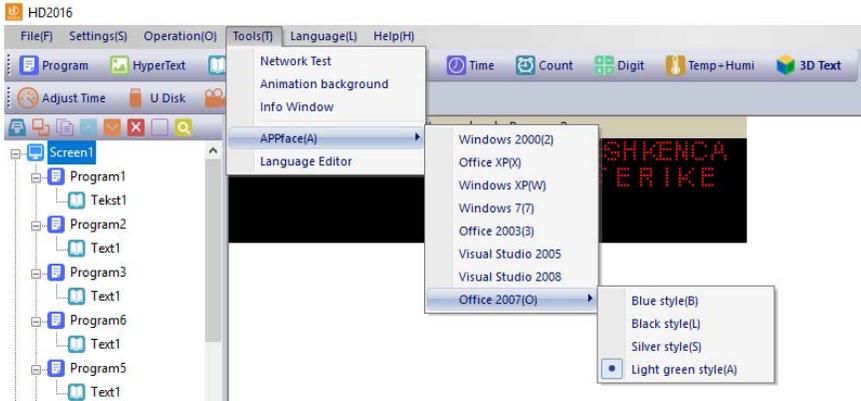
Figure 28. Tools Menu(T)
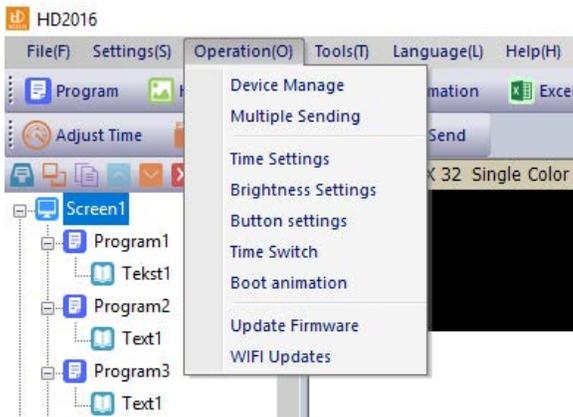
Figure 29. Operation Menu (O)
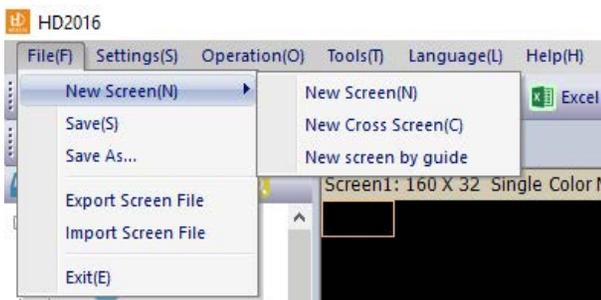
Figure 30. File Menu (F)

Toolbar

Figure 31. Toolbar

It consists of a collection of tools used for building various programs that contain text, pictures, animations. Each of these tools performs a specific function within PowerLed and are useful in building different programs, the use of these tools is limited only by creativity. They can be used as often as we need.

Program tool

It is used for the introduction of a new program within a screen (screen1)
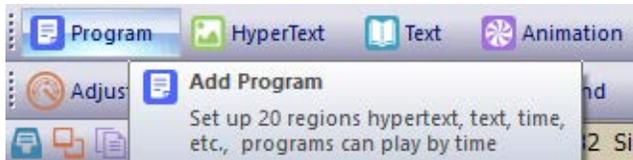
Figure 32. Program tool

Text tool – It is used for inserting text in certain areas of the screen
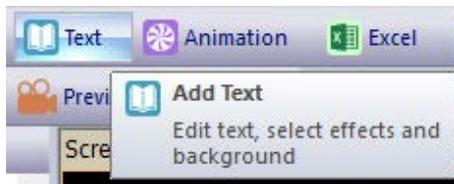
Figure 33. Text tool

Time tool – It is used to set the analog or digital clock in a certain area of the screen

Figure 34. Time tool

Temp + Humi tool – It is used for temperature setting if the thermometer is connected to the LED panel:

Figure 35. Temp + Humi tool

Preview tool – It is used for presenting the text of the program before it is stored in memory or transmitted via RF equipment or Wi-Fi technology in the LED panel 96×16.
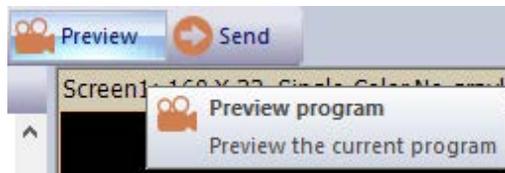
Figure 36. Preview tool

Figure 37. An example of the Preview window

U disk tool

It is used for exporting screen (Screen1) prepared with certain programs and texts in memory (USB) provided that the Memory Flush is placed in the relevant computer port. After export to Memory Card (USB), the same goes out of the computer port and is placed on the LED panel port. In this case the program is read and the OK message is displayed on the LED panel. At this moment, the flash memory is removed from the LED panel and the device works according to the program now installed on the 96×16 LED panel!

Figure 38. U disc tool

Property window

This window allows you to use all of the tools found in PowerLed. It is determined that a text that appears on the panel for a certain interval then comes next with the animation that I choose and many other manipulations such as the determination of the amount of diode illumination.

With this tool, the text is exported to the peripheral device and in our case on the flash memory (U Disk). Communication with the software is performed as in Figure 39.
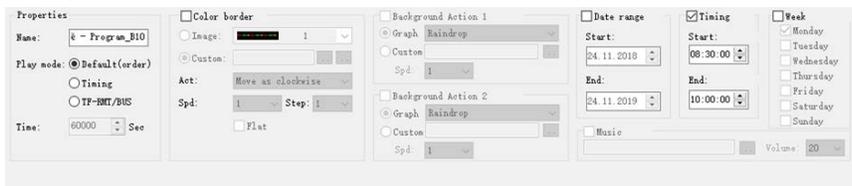
Figure 39. Exporting (transferring) the program in the flash memory (USB)

Results and discussion

During the development of this project, it was hard working with students in order to achieve the good results and to involve the students in the real projects and to teach more practically students with real projects. In this contest are applied the students knowledge from the lessons learned on electronics, programming and mathematics. Result of this project produced the success of eliminating the disturbing cases during the study process in the classrooms because the information what is happening inside the classroom now everyone from outside can take from the diodes panel and can get those information without opening the doors. With this project it is achieved that process of digitalization at faculties will be expended even more in order to have panels each door that need to show information what is going on inside.

What about the future

In the future it is planned to be presented and implemented in all the faculties of University "Kadri Zeka" and all the universities of Kosovo. At the same time it is made the request from the working group of professors and students to the Faculty of Computer Science, for such a new implementation. In the mean time will work with working group of students and professors in order to advance with new technology and new way of implementation, also integrating the Wi-Fi technology and also RFID to pass the code to the panels, and even more to add the other informations in the actual classrooms.

Conclusion

There are many ways of digitalization that could happen on the university areas, one of them we have used to digitalize our campus in the university using LED display panels. In our project this feature of panels who do have all the possibilities to write the information and the data could be transfer using USB disk it was very helpful on communicating with the LED panels in our University campus. The software that uses codes makes it easy to write the text, make animations, and set timers to the LED display panel. We have tested and fully implemented on our university campus where we have digitalized all possible information for students, professors, and others who do use our campus.

This was very helpful with U disk exporting the parameters to the LED diode panel display and was quite easy for the places where the panels are reached by people but for the places where the panels are placed on the high height it could not be easy to put the program each time you

change. In order to make easier to put the parameters to panels for the future work we do propose there could be done also communication using RFID and wireless technology.
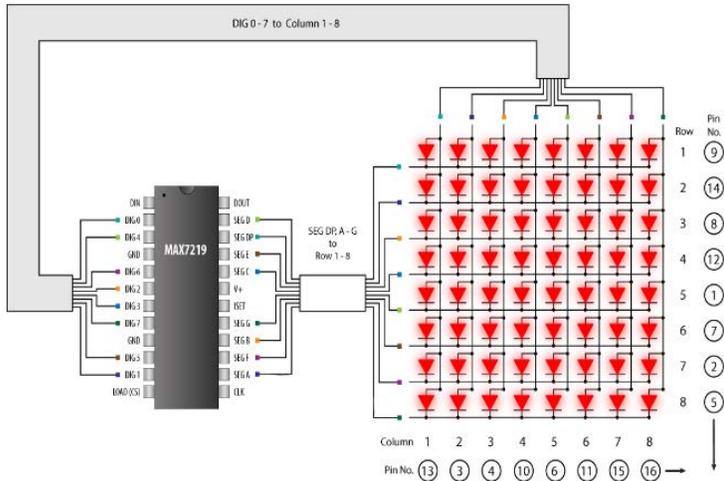
Figure 39. Electrical circuit of LED diode connection in the form 8×8 (Philip Burgess, Arduino and compatible boards)

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TEACH-GYM: GROW YOUR METHODOLOGIES

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ABSTRACT

This paper reports on a recent initiative put in action within the long-lasting connection between a European University and a Central Asia Institution. An Uzbek Technical University, Turin Polytechnic University in Tashkent, has been created in 2009, offering double degree programs under the supervision of Politecnico di Torino, Italy. The differences and educational needs of the two involved countries stimulated a contest of ideas, aimed at supporting the redefinition of teaching methodologies and course contents in bachelor programs. The proposed project becomes a "GYM", with win-win benefits for both institutions. On one side, more specializing courses are offered, as required by the role of the undergraduate education in Uzbekistan, and on the other hand, the experience and methodology are going to be transferred within the Italian university. Both qualitative and quantitative data have been analysed and presented, based on the initial selection of the best projects which are implemented starting from the second semester of the current academic year.

Keywords: engineering education, international connections, learning by doing, teaching methodology.

Introduction

Before the 1980s, inside the Soviet Union's academia and higher education, there were very little scientific interactions with the Western countries. In 1990, with the collapse of socialism, the Central Asia and Caucasus region is been organized in eight former Soviet republics: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan, and Tajikistan, following different reform paths (Çokgezen & Çokgezen, 2014).

In almost all of these countries the reform package included the reorganization of curricula, introduction of new standards in student assessments, decentralization and privatization of higher education, privatization and liberalization of textbook publishing, and reorganization of schools (Kirtchik, 2012).

Some universities and research institutions, established in the post-Soviet era, were set up in partnership with foreign institutions and financed by international NGOs, foundations, and local governments. They mostly hire Western educated locals or foreign staff and provide Western style education, usually in English, and more incentives and opportunities for research than the old, state institutions (Pleskovic et al., 2002).

In this context, in Uzbekistan the processes of internationalization of higher education started formally in 1991; but only in 1997, the new Act on Education and the National program on Personnel Training was approved by the government. This act redesigned the structure of higher education in favour of western educational systems, with 4-year Bachelor studies and 2-year Master courses, underlining the country's desires to be part of the international community (Eshchanov et al., 2011).

Therefore, thanks to these efforts, some foreign universities started their own branch in Uzbekistan. After some years the Uzavtosanoat SC, General Motors Corporation and Politecnico di Torino (PoliTo, Italy), one of the biggest technical universities in Europe, reached an agreement on the organization of Turin Polytechnic University in Tashkent (TTPU), the first example of Bachelor internationalization in the area of Engineering. This private institution was officially established in April 2009 and shortly became the main source of human resources not only for the automotive industry but also for construction and architecture, energy engineering and information technologies. TTPU professors are supported by PoliTo ones with training and exchange periods; PoliTo and TTPU professors are teaching in collaboration and students receive the diploma of both institutions (double degree) as indicated in Table 1 and the courses are delivered entirely in English.

According to the national Act directions, the study plan is developed over 4 years: a first preparatory year (PY) managed entirely by Uzbekistan lecturers, supervised by PoliTo, and a triennium (First, Second, Third level) in accordance with the Bologna Process with the courses jointly delivered by PoliTo and TTPU professors. All local lecturers are identified by TTPU and evaluated by PoliTo.

During the first academic year (a.y. 2009/10) the number of bachelor's admissible students was about 200. This maximum number has grown in the years until 350 students in the a.y. 2018/19 with 1200 students that applied for admission. The TTPU structure provides the admission through the TIL, Test in Laib, similar to that carried out at PoliTo main campus

in Italy (Ballatore, Montanaro, & Tabacco, 2018). Students that positively pass the test can choose among one of the 3 active study courses according to Table 1.

The student composition is mostly male both for cultural reasons and for the type of studies (gender issue in STEM). The Uzbekistan scholar system requires 11 years of school before entering university and, as a result, students mostly start university at 18 years old.

The first cohort of students (2009/10) graduated at the end of 2013. Table 2 shows the number of graduates per solar year with the details of the individual degree courses.

Usually bachelor graduates immediately enter in the working life and only a few of them are enrolling into Master of Science, either in Uzbekistan or abroad (around 10%).

This trend is the opposite to the Italian situation in which bachelor graduates for about 80% continue their studies and only 20% enter directly into the world of work.

Table 1. Active study courses with the relative number of admissible students

TTPU study course	Related PoliTo degree	Number of admissible students
Mechanical Engineering	Ingegneria Meccanica	200
Information Technology and Automation Systems in Industry	Ingegneria Informatica	100
Industrial and Civil Engineering and Architecture	Ingegneria Civile	50

Therefore, there are some different curriculum requirements on the bachelor design that need to fit this different scenario. In particular in Uzbekistan it is been registered a mismatch between expectations of graduates, from one side, and actual degree of satisfaction with the existing levels of developing employability competence areas, from the other (Nizamov & Nurjanova, 2017).

Aim of the study

The 10 years of directional contribution from Italy to Uzbekistan have favoured some critical reflections on the type of internationalization in place and on the teaching methodology in light of the needs of local reality. Those thoughts can be formulated in the following research questions:
- How it is possible to make the connection between the two institutions a "win-win" link and not just a simple monodirectional relation from PoliTo to TTPU?

- In light of the mismatch between higher education expectation and working skills requirements, how can be reviewed the teaching methodologies and the course contents in bachelor courses?

These two points are strongly related as the second question is analysing an aspect of teaching not well developed in Italy. That is, the impact on higher education caused by the anticipation of working life after the bachelor graduation.

The Uzbek reality thus can become a "GYM", in the sense that it offers the opportunity to train by experimenting with these new approaches in order to transfer the methodology and the experience acquired within PoliTo bachelors. Moreover, thanks to the difference in the size of the students' population (some hundreds in TTPU and thousands in PoliTo), on one side these new approaches are expected to strengthen the in-depth preparation and job-oriented background, and, on the other hand, they will create a solid and proven tool for the application of a similar teaching framework to a larger group of students. Therefore, to address those research questions, a contest of ideas, the "Grow Your Methodology - GYM call", is been set with financial support for the implementation of the winner projects.

Table 2. Graduated students each year for study course

	2014	2015	2016	2017	2018	2019
Mechanical Engineering	68	97	68	64	64	
Information Technology and Automation Systems in Industry	18	15	17	29	13	
Industrial and Civil Engineering and Architecture	20	32	20	11	23	
Total	106	144	105	104	100	>150

Theoretical Framework

The internationalization process in place between PoliTo and TTPU try to include all the seven themes described by Teichler: (i) physical mobility of academic staff and students; (ii) recognition of study achievements across borders; (iii) different modes of transfer of knowledge across borders; (iv) internationality in the substance of higher education; (v) international orientation and attitudes, (vi) similarity of heterogeneity of national systems of higher education; (vii) internationalization as an argument for almost any higher education reform (Teichler, 2010).

Starting from those pillars, the project related to the research questions above, the GYM call, is primarily lying on two theories: one psychological,
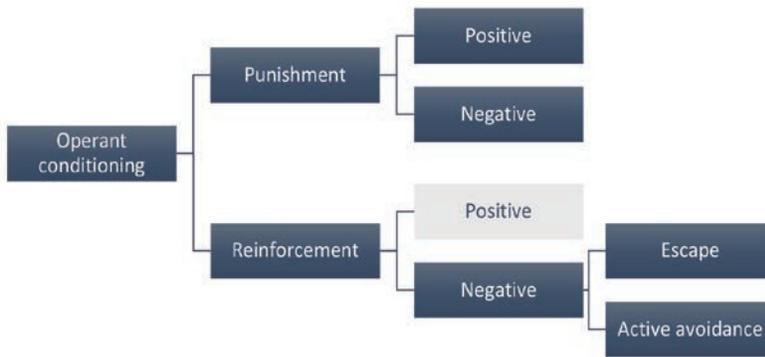
Figure 1. Diagram of operant conditioning

the operant conditioning (Skinner, 2011; Reynolds, 1975), and the other pedagogical, the learning by doing (Kolb, 1984).

The first one refers to a behaviourist theory in which an action is either incentivized through a *reinforcement* process or eliminated by a *punishment* (Figure 1). In particular, this research uses the effects that a positive reinforcement process produces. That is, if the individual behaves as desired, the reinforcers are favourable events or outcomes like praise and rewards. One of the key points behind this theory is that the response that follow a reinforcing stimulus is voluntary. Moreover, the GYM, as a call for idea, is itself the voluntary reward: it inspires and motivates professors in reviewing their teaching methodologies and test new strategies with academic support and coverage of possible extra costs. In this way, the voluntary response is more likely to be done by the individual.

On the pedagogical point of view, the theoretical framework adopted is the well-known experimental learning, also called learning by doing. The father of this theory, Kolb, believes "learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984). Therefore, he theorized a cyclical model of learning, consisting of four stages (Figure 2): (i) do, (ii) observe, (iii) think, and (iv) plan. The process starts with a concrete experience in which learner actively does an activity or an experimentation. Then, there is a reflective observation where there is a conscious look back at that experience. The third stage is where the attempt to think and define a theory or model of what is performed, the abstract conceptualization, and, finally, the trying to plan how to test a model or theory or plan for a forthcoming experience, the so-called active experimentation. In this research the learners are professors willing to experience a new teaching style. The cycle starts with
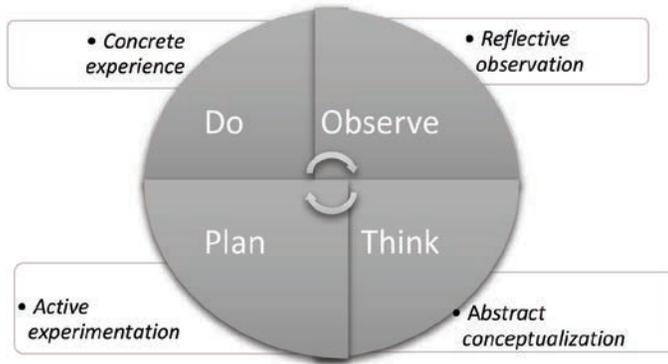
Figure 2. Kolb's experimental learning cycle

the requirement of rethink about their courses both in contents and way of teaching in the Uzbekistan environment. Thanks to this exercise, as in a traditional gym, lecturers can see and judge the changes with the PoliTo technical support, and he/she can think how to generalize it in order to make the active experimentation also at the Italian campus.

Materials and Methods

A mixed approach is going to be used in order to explain the need for a change in teaching practice and the overall effect of the new bidirectional connections. In particular, the students' career data have been quantitative analysed, whereas the call elements, i.e. structured projects, interviews and impact, are going to be considered for the qualitative approach.

In Uzbekistan, the anticipation of the entering the labour market makes urge experimentation and reformulation of the educational formats, progressively inviting to give space to new forms of experiential teaching, focused on the student and aligned with local needs, such as industrial environments and technology transfer for the growth of the country.

On the quantitative side the students' university careers are been considered, as well as their decision about whether to keep study through a Master or to work. In particular, the lesson frequency, and the rate of success are been analysed.

Therefore, it is possible to recognize the presence of two distinct needs: on the one hand to continue to ensure solid training, and on the other to foster the development of intermediate technical skills and a rapid integration into the world of work.

This study has been designed as a "gym" in which professors can grow their teaching methodologies in bachelor courses thanks to some first

job-oriented experimentation actually in place at the Master of Science in PoliTo and the support of the TEACH (Teaching Engineering Avant-garde Challenge Host) research group. Therefore, professors can train and explore those new ways of teaching in a smaller environment in order to feel more comfortable and implement them also in their Italian courses.

The call related to the GYM was sent to the entire PoliTo community of lecturers, both to the ones that already have the responsibility of a course in TTPU, 60 people, and to the remaining not yet involved in the Uzbekistan internationalization project 800 professors. The above numbers are an average over the 10 years' experience.

In order to participate, each candidate needed to fill an online survey with all the main information about their structured project ideas:

- the course addressing the change
- the portion of the course to be reviewed
- how he/she is willing to review it
- how and why is matching with the Uzbek context
- expected improvement
- interaction with locals (local lecturers, factories and partners)
- personal statement
- facilitator factors
- evaluation of the effectiveness of the new modalities
- sustainability after the project
- resources (human, economic and logistic).

Some constraints were set on the maximum value of economic resources available for each submission and about the creation of new courses, that were not eligible.

A commission judges each proposal and decides which one is mature to be implemented in practice at TTPU starting from March 2019. In the meantime, both a statistical and a meta-analysis is performed on the surveys' content.

Results

In light of the 10 years of collaboration, a deep understanding of the Uzbekistan reality is in force of the PoliTo professors. Although it is well known that, in average, only approximatively 10% of students decide to continue their education through a Master of Science, the teaching methodologies adopted are very similar to the one in use in Italy. Moreover, due to the high cost of graduate education in Uzbekistan, a portion of TTPU students generally needs to have some partial job during the Bachelor studies. This, together with some cultural aspects mainly related to the freedom of students in attending lectures, directly impact

the frequency of the lessons, that is stable around 30% for the majority of the course, and the duration of the career, which is extended to 5 years in average over the standard duration of 4.

As the students' reaction to changes is hard to predict and estimate, during the first semester (October-December 2018) some tentative approaches were made in two different courses. In both cases the new methodology was mainly based on a more experience-based learning through labs and simulations. Students response was very positive as the number of students attending the lessons every day almost double (around 60%). In the meantime, the course content was better understood as shows by the improvement on the rate of success, both in percentage (gain above 20%) and in grades (increase around 2/30) in these two trials.

This first partial experimentation clears up the potentiality behind the "GYM" project. In fact, on the student point of view it represents the possibility to receive a more job-oriented education that they found extremely interesting for their future career. In the meantime, professors that get involved were truly satisfied and found positively the external stimulation on reshaping their course both in contents and methods. The outcome of the project is hence expected to positively impact on both institutions, thus creating a win-win interrelation. On one side, PoliTo is going to receive a quantitative feedback on the effectiveness of the courses' reconfiguration in terms of acquired skills, active participation of students in the class and passing rate, with a direct impact on the redesign of the courses delivered in Italy. On the other hand, not only students but also TTPU professors and assistants are expected gain a lot in terms of experience useful for their future role in their home University, due to their deep involvement in all the phases of the project implementation and class activities.

Considering the requirement of residential that the project's participation indirectly imply, the call received a quite high number of submissions: 14 proposals have arrived. They were formulated by 9 out to 11 PoliTo departments, representing the variety of almost all the different scientific areas. These data also tell the desire of making auto-rethinking of each different discipline. All the proposal's leaders are or have been somehow already involved in the TTPU exchange, however in 4 cases the course reshape includes new people not yet been in the international mobility. The involvement of Uzbekistan lecturers is deepened in the 80% of the submissions requiring some mobility period for them at the Italian campus or the change in structure in order to better coordinate the contents.

Moreover, two submissions consist on an aggregated proposal of different courses, 4 in one case and 5 in the other. The idea behind is an interdisciplinary experiential project that includes interactive labs, computer-based simulations and coordination among the different

traditional lessons' topics. Half of the other 12 ideas were involving the full course, while the remaining 6 were proposing modification only to a portion of the course (Figure 3).

Figure 3. Distribution of proposals based on the portion of the course

If one considers the type of proposal based on their impact, the distribution about the content of each proposal can affect the course structure, the methodology or the examination process. Almost all the projects, 13 out of 14, want to modify the teaching methods; 10 submissions propose a review on the structure; 8 also suggest a review of the examination stage.

An in deep literature research was performed by all proposals in order to better match the labor work skills requirements in light of the experience already in place around the world. Based on this, the ideas are been categorized by the approach proposed, that is experimental and labs, problem-based-learning, study support, external expertise. The majority of the proposals can be found on the first group as 9 of them consider the experimental teaching as a possible reinforcement of the skills required by the labor market. Instead, other 3 adopted the project-based-learning to address this problem with a direct interaction with local factories and partners. In the meantime, the reinforcement of study methods is also a specific core of 3 submissions in which students are guided to reach autonomy in learning a technical subject. Only 2 ideas instead include the involvement in the theoretical lessons of partners from the world of work with study case explanation and discussion.

The activities are usually organized in small groups (5 out of 14) or require first-of-all a class explanation followed by discussion on groups (3). Instead, the remaining submissions require either individual works and involvements (4) or the entire class (2) (Figure 4).

Moreover, 2 proponents asked to start with a partial implementation of the course remodulation on a portion of students in order to feel more confident with the new structures and methodologies as well as to understand the students' reactions.

Figure 4. Distribution of what type of involvement is required in the proposals

After this overall analysis, a commission designed by PoliTo Rector had judged all the proposals in light of the Kolb's learning cycle. 12 of them where accepted with some suggestions mostly about the concrete start of the project, whilst the other 2 required a review. This rethinking could be necessary because of environmental constrains, like labs capacity, or of technical problem, as a weak external network. These 2 projects will receive a support during this year in order to be implemented in the future.

Partial conclusions (ongoing project)

The mental exercise that each professor made for rethink about his/her course and teaching methodology is the first positive effect of the GYM. In particular, this effort impacts directly the TTPU campus and, in the meantime, is indirectly changing the way professors teach at the Italian one. While the gym exercise become more practical by the start of each redesigned course, professors will transfer their learning in the PoliTo courses as well.

The project is just started and even if we are far from ultimate conclusions, its preliminary outcome from the ongoing implementation of the GYM idea in the first three courses is extremely positive. In two cases, a boost in the attendance and participation of students is registered. In another, the evaluation of students based on distributed assessments during the teaching period allowed most of the students passing the exam at the end of the course, well in advance before the coming exam session.

Then, the connection, already in place between a historical European University and a young Asian Institution, has now a different perspective: from "give to bring" to "win-win". Italian professors, in fact, can experience a new way of teaching and improve their teaching methodologies; whereas the Uzbekistan ones continue to grow their teaching and research skills.

Considering the mismatch between higher education expectation and working skill requirements, the proposals mainly suggested a more experimental approach through labs, interactive exercise sections and external visits.

The strengthening of factories' network in each study course is another attempt to create a stronger connection between bachelor education and working skills.

Recommendations/Implications/Future research plans

The GYM project is actually ongoing, and a complete analysis of impact will be available in March 2020, when the experimental stage will end. In the meantime, also the impact that this would have been generating in the Italian campus will be further studied.

The replicability of this project requires a high degree of understanding of the local reality and needs; such as typical students' behavior, way of teaching of lectures, request of the labour market. Once the context information is available the experience can be easily repeated.

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Acknowledgements

TECHNOLOGY AND RELATIONSHIPS IN THE GUIDANCE CONTEXT: AN ARTICLE BASED ON A STUDY OF SUSTAINABLE RELATIONSHIPS IN GUIDANCE SITUATIONS BETWEEN TEACHERS AND STUDENTS IN HIGHER EDUCATION

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ABSTRACT

As teacher educators and mentors, we have long been concerned with establishing an effective guidance tradition among our students and in this way ensuring that each individual student takes care of his/her professional and personal growth. We need more knowledge of what is necessary for guidance to be perceived as meaningful, and thus we must facilitate students' acquisition of knowledge about guidance. Sustainable relationships between teachers and students are needed, and we must consider how modern technology may be used in an effective and appropriate manner in this context. By 'sustainable relationships', we refer to relationships that meet mentees' needs without reducing their opportunities for promoting new insights. A mentee is an individual who is advised, trained, or counselled by a mentor, an experienced and trusted adviser who helps a mentee prepare for the profession. Online studies, which are becoming increasingly common, provide great opportunities for students to become educated. This technology enables fast and efficient communication between students and supervisors as well as allows users to share competences across campuses and national borders. We are facing a paradigm shift in education regarding both the opportunities and challenges of the technological options available today. While the university sector may not have been at the forefront of technological development, a number of online studies are nevertheless currently available to students worldwide.

In order to determine more about the opportunities and challenges associated with guidance, we conversed with a selection of students at our institution and asked questions about the extent to which online guidance can handle the various aspects of supervision. This research is based on a survey conducted among 43 fresh students in primary school teacher education and 31 more experienced teachers who are students in a mentor education program. We chose two such different groups due to our interest in determining

whether teacher experience results in differing perceptions of what guidance means for students. What do students consider important regarding effective guidance? Are technological solutions sufficient for knowledge construction? In any guidance context, there exists a relationship, and the relationship concept is central to several of our questions. Our findings reveal that all students prefer a mentor–mentee relationship that includes elements of recognition and warmth.

Keywords: guidance, relations, analogue, digital communication, recognition.

Theoretical Perspectives

Gregory Bateson (1972) points out that relationships between individuals are fundamental in all forms of communication, and our being part of many different systems is what makes us human:

> Communication not only consists of identifiable messages sent back and forth, and of the ever-changing initiatives and responses of dialogue, but also of emotional inner and outer impulses that characterize the relationship, process, change and development of the relationships. Human signs and signals are parts of this process and will probably affect a relation (Eide & Eide, 2017, p. 76).

We find that the technological revolution we have experienced in recent years has led to a form of division between those who master technology and those who do not. Advisor and former director of the Norwegian *Aftenposten* Mobile, Anette Mellbye, claims that no industries will be untouched by the technological revolution (Mellbye, 2016), which will favour companies that heavily invest in algorithms, data, and infrastructure. In practice, this means educational institutions can end up in a backwater if one does not choose to hang onto and provide for technology's introduction and development in education.

Geertrui Smedts (2008) argues in an article referenced in Smeyers and Depaepe (2008) that we are *technologicalizing* the world through everything related to technology:

> It is not only the goals that will be determined by technology, but also the means to achieve those goals. I will call this tendency the technological submergence of our lives. This will involve reference to the technology of the society we live in, a condition in which everything is seen in terms of instrumental value (Smedts, 2008, p. 111).

According to Smedts (2008), some others cleverly find a way through the phrase 'paying full attention' *within* the realm of technology. For example, Lambeir (2004) concludes that we '...must keep alive our imagination about how to use it (ICT) in multiple ways' (p. 310) and

that we should strive for 'total involvement, or committing one's entire being' (p. 314). Regarding educational relationships, Lambeir (2004) concludes that ICT offers opportunities for 'educational dialogue', arguing that: '... xperimenting with hypertext, websites, virtual design, and online identities contribute to the constitution of the person' (p.355). ICT is from its point of view more than tools.

The Challenges of Technology

The colonization of practices under educational control means routine, non-educational issues become defined in terms of (lifelong) learning competencies, the acquisition of skills, final attainment levels, learning disabilities, and so on. We shall call this tendency the *technological submergence* of our lives, which involves reference to the *technology* of the society within which we live—a condition wherein everything seems to be perceived in terms of instrumental value. Technology's immediately visible impact is that youngsters are perceived as the experts while parents *must* 'catch up' (Smedts, 2008). In the context of our field, this may imply that young students are experts in technology and we, as mentors, are novices. But what is really included in the guidance concept? We further elucidate this idea below.

Understanding Guidance

In general, we can assert that guidance is facilitated between many different people with various occupational backgrounds and experience levels. In a teacher education context, guidance must characterize both teaching and practice; in a practical application, this means guidance should be a known and used tool that ensures pedagogical development and growth in mentees. For students, receiving guidance includes both direct meetings and a digital learning platform. With regard to the concept of guidance itself, several definitions are used within the academic environment, and several Norwegian researchers suppose there likely exists no consensus on a definitive definition (Tveiten, 2013). Many individuals who work inside the Norwegian guidance field are well aware of Gunnar Handal and Per Lauvås's (2017) 'action–reflection model', which concerns reflection before, during, and after an action to ensure the mentee receives high-quality development and learning.

Ole Løw (2009) claims guidance is a method of stimulating students for their own learning, defining it as a common term that encompasses counselling, supervision, consultation, mentoring, and coaching. In such a comprehensive definition, guidance is defined within two dimensions: (1) guidance and road searching and (2) answers and questions. Løw (2009) suggests that the term guidance is reserved for the complementary relationship

between the more experienced and competent and the less experienced and often less competent in a teaching, educational, or vocational context.

In English language literature, the concepts of counselling and supervision are used interchangeably, while consultation, guidance, and mentoring are additionally identified in this field (Butterworth & Faugier, 1998). The main difference between, for example, counselling, mentoring, supervising, and coaching, may be considered the mentee's freedom to determine his/her own actions without too much external influence.

The Congruent Supervisor

Carl Rogers (1957) was greatly important for the development of the guidance field and guidance pedagogy at the international level. In Rogers's (1957) theory, recognition and acceptance are some of the most fundamental in the face of *the other*, which means the mentor sees the mentee as an individual and independent person and thus accepts his attitudes, actions, and narratives. In fact, this concept means accepting and being neither judgemental nor condescending towards others, thus resulting in the mentee's opportunity for self-reflection. For this situation, Rogers draws the following picture: 'If a person can be understood, he or she belongs' (Thorne, 2003, p. 39).

Rogers (1957) raises the concept of unconditionally positive respect, which includes a mentor's warmth and care for a mentee as well as his/her ability to set aside his/her own concerns during the guidance situation. It is necessary that one pay attention to what the other must come by (Rogers, 1957). Taking care of the mentee also requires that the mentor practice empathetic behaviour and consequently be concerned with how the mentee perceives him/her. According to Rogers (1957), when a human experience is understood in a guidance situation, it directly affects the relationship between the mentor and the mentee.

Finally, Rogers (1957) discusses the importance that the mentor be congruent, which we understand as being oneself in a genuine and sincere way in both open-mindedness and presence. The author asserts that when the mentor is genuine and sincere, he may become aware of himself as a human being, which is important when helping others. Eye contact is a practical example of effectively connecting in a conversation, and in guidance situations, it is important that the mentee experience the mentor as trustful, helpful, and sincere.

Relationship Value

According to Marion Jones (2010), the supervisor must hold a critical understanding of the supervisory role, the potential tensions accompanying such a role, and the capacity for critical self-evaluation. In addition to

professional and academic knowledge and skills, a tutor requires strong interpersonal evaluation and communication skills as well as emotional intelligence (Jones, 2010; cited in Smith & Ulvik, 2018, p. 124).

Gregory Bateson (1972) focused his attention on describing relationships rather than individuals or human traits. Bateson spoke warmly about the actions or reactions resulting from the relationships one forms as a human being. In Bateson's (1972) theory, relationships exist very basically between phenomena and between people in all forms of communication. Moreover, communication simultaneously takes place at several levels, which we can understand by considering that a conversation contains content but also concerns an individual's relationship to the content and to the other individual engaging in the conversation. In this sense, we communicate at several levels simultaneously. If we, for instance, raise the understanding of what I communicate to you by one level, then we are concerned with your understanding of my understanding of the conversation's content. In Bateson's (1972) theory, all communication is constantly meta-communicative, meaning we always communicate about content when we communicate about our relationship.

If one supervises a student, then, as a supervisor, one should consider that a manual (guidance manual) has several levels. In the light of the relationship concept, a relationship already exists in that a guidance situation has been established. The relationship's content may depend upon how well the supervisor and the supervised know each other and how their communication is established. It is necessary to be aware that communication involves both verbal and non-verbal aspects. Establishing an effective relationship concerns, for example, the words we use, the questions we ask, and how we present our messages while simultaneously opening up a dialogue. On the other hand, communication is about our body language, such as how we use our eyes, how we use our hands, if one has an open or closed posture, and what kinds of facial expressions match the other party in the guide.

Establishing a Relationship in a Guidance Situation

In Bjørn Killingmo's (1998) article, the attention is directed to the relationship that is established when two individuals converse, wherein the focus is–among other aspects–drawn to what each individual carries into the conversation. For example, situations may arise wherein an individual who seeks a conversation partner has an agenda that is not perceived by the other. At the same time, the mentor brings with him his values and morals, which can be decisive regarding what kind of guidance he offers. This backdrop can trigger negative energy in the person seeking guidance and thus end in his/her resignation.

An experienced teacher often possesses knowledge of what works in given situations and can easily give into the temptation of becoming a counsellor based on what is immediately perceived as one's need for guidance. Such attitude can indicate the importance of both listening to what is spoken and at the same time studying the other's body language to decipher the message. By concluding too quickly, the supervisor is at risk of becoming one who limits a student's creativity rather than opening up new and alternative solutions. In order for the dialogue to be fruitful and produce the best possible result, it is necessary that the mentee experience security and recognition; in this context, recognition with others is a key concept. Axel Honneth (1992) claims that the development of personal identity requires the experience of recognition. Honneth (1992) describes various arenas for recognition, including close relationships, the legal sphere, and social contexts. The legal sphere is what we experience when we enter society and meet laws, rules, and regulations that establish various opportunities, limitations, and rights. The social sphere involves valuation, in which we experience responses to positive attributes, contribute to public benefit, and experience ourselves as individuals. We highlight four essential elements in relation to the recognition concept: to be seen, to be listened to, to understand, and to receive confirmation. In order for a human to experience recognition and experience as a subject, Honneth (1992) asserts that these four elements are fundamental (Schibbye, 2004).

Recognized Norwegian psychologist Dag Ø. Nordanger discusses the importance of interpersonal competence in therapeutic meetings and highlights the strength that lies in the therapist–patient alliance (Nordanger, 2018). We should briefly point out that a guidance conversation is not a therapeutic situation, although many common features deal with relationships in the various meetings between someone who needs help and someone who wants to help. Nordanger promotes an interesting question by wondering why some therapists fail with most patients while others achieve success with almost everyone they get in contact with, despite their use of the same therapy method. Nordanger (2018) believes this is largely about the relationship's power and emphasizes the importance of establishing an effective relationship characterized by empathy, flexibility, cooperation, and understanding.

Danish philosopher Knud Løgstup (1991) highlights the caring perspective when describing offering something of one's own to the other during a meeting and therefore having more or less of the other's life in one's hand; this again implies that, according to Løgstrup, every single meeting between individuals in this way represents valuable diversity. In a guidance situation or in a counselling interview, this perspective means

one has a piece of the other's life in one's hands; if one guides another, what one says and does will affect the other in some way. One important consideration is that the words one uses - both positive and negative - can be remembered for the rest of another's life.

Previous Research

Previous research on *effective guidance* points to the needs that characterize newly educated teachers as well as what characterizes effective guidance through the planning and use of strategic tools (Lejonberg & Føinum, 2018). We nevertheless fail to pay adequate attention to the interpersonal perspective based on a mentor's relationship competence and the direct meeting between teacher and student, which is in our context referred to as mentor and mentee. Experience suggests that effective tools and professional knowledge do not help if the mentor's ability to establish a strong relationship is absent.

Many have written about the relationship's importance in the guidance context. Norwegian researchers Grete Haugan, Eva Aigeltinger, and Venke Sørlie (2012) published an article in Norwegian journal *Sykepleien*, in which they point out that students '...may have unrealistic notions that supervisors basically know what appropriate responsibility for the student is' (p. 11). The authors mention that responsibility also concerns one's demonstration of confidence, trust, and effective relationships.

A strong picture of what matters in a guidance situation is Lambert's Pie (Asay & Lambert, 1999), which is a model based on research supporting that the following factors affect guidance: 'Technique and model factors 15%, expectancy and placebo effects 15%, The therapeutic relationship 30%, Client variables and extra therapeutic events 40%' (Asay & Lambert, 1999; Cooper, 2008, p. 56). Based on this model, we can determine that the relationship between the supervisor and road applicant in a counselling conversation possesses significant meaning and concerns expectations, past experiences in similar situations, and techniques or methodologies used while the two parties converse.

In a quantitative study conducted by Norwegian researcher Eli Lejonberg (2016), lector students' assessments of guidance in practice were investigated. They evaluated their own teaching skills and experiences of trust during guidance situations, emphasizing the importance of receiving clear feedback on the guidance situations. In terms of relationships, the findings revealed that the lecturers' ability to obtain their degrees was highlight dependent upon trust between them and their mentees. An interesting finding from the survey indicated that the students who considered their mentors' competence to be high also had greater faith in their own abilities as teachers. Conversely, the study says little about what

creates an effective mentor–mentee relationship and what can contribute towards creating trust and security in a guidance situation. Through our research, we wish to highlight what students believe we, as mentors, should be aware of during guidance situations.

Methodological Design

Our research is based on a qualitative study in which where we are interested in determining students' thoughts about the factors at play and the relationship's importance in the guidance context. We believe there exists an underlying hypothesis that claims the relationship between the mentor and mentee is important.

This study deals with action practice without the practice itself (guidance) being the subject of research; such cases can be classified as a phenomenological approach (Creswell, 1998; Postholm, 2010, p. 17). Postholm refers to Moustaka (1994), who claims that '...the main purpose of phenomenological research is to understand meaningful, concrete relationships that are present in a specific situation or a specific context' (cited in Postholm, 2010, p. 43). These observations cannot be made by the researcher, yet the experiences are not forgotten by those who have experienced them; thus, experiences may be obtained by talking to participants (Postholm, 2010, p. 43). In order to answer our research questions, we studied two groups of students, one of which constitutes first-year students (43) in teacher education and the other of which constitutes students enrolled in mentor education (31). To obtain data, we developed a questionnaire with the following variables: *age, gender, knowledge, proximity/distance, relationship/relationship skills, and educational level.* Furthermore, we discuss our data through a socio-cultural perspective in light of the theory of relationships, recognition, and communication.

Findings in the Data Material

The data reveal that many interviewees believe knowing one's mentor is important, while the extent to which one knows one's mentor was not brought up as a concern. Specifically, 42 percent of the young participants (younger than 30 years) believe this factor is greatly important, while merely 4 percent of the older participants (older than 30 years) who have more experience believe this factor to be greatly significant.

The mentor's age is considered less important for one to experience effective guidance. Nearly 80 percent of all participants claimed that age has no or little significance, and computer material also demonstrates that the mentor's gender typically does not affect the counselling situation in a positive or negative way. Among the younger students, however,

55 percent believe gender can at times affect how the mentee experiences guidance, although this variable's significance was not elaborated upon.

The mentor's education level may affect the guidance situation's yield. For this variable, 46 percent of participants claimed that education is quite significant, while 35 percent believe education is only somewhat significant. Interestingly, 40 percent of those who believe education is quite significant include students younger than age 30, while 20 percent of those in this group believe education is somewhat significant. Among the most experienced students, none believe the mentor's education level is greatly important regarding his/her supervision, but most agree that education level has some significance.

When it comes to questions about guidance and whether or not a conversation is affected by the mentor–mentee relationship, the participants' responses were divided between somewhat significant and greatly significant; their responses are italicized in the text below. Of all respondents, 58 percent answered that the *relationship was of great importance,* while 40 percent responded that the *relationship had some significance.* No participants believe the relationship does not matter at all, but one respondent believes the relationship holds little significance. Herein, a significant correspondence thus exists between what the young students believe and what the older students with more experience believe. If we consider this in light of the mentor's possession of relationship competence, 56 percent perceive this variable as very important, while 40 percent perceive it as somewhat important. A total of 60 percent claimed it is greatly important that the mentor establish an effective relationship during the first meeting with his/her mentee, while no respondents believe this variable is entirely unimportant.

In total, 71 percent of the informants believe it is somewhat important that the mentor *balance between proximity and distance during a manual call,* while 26 percent believe this variable to be very important and none believe it to be entirely unimportant. In the survey, no guidelines were established regarding what the informants should understand about proximity and distance; rather, they interpreted their beliefs based of their own standpoints and professional knowledge.

In the questionnaire's open box concerning what they believe distinguishes an effective relationship and what constitutes relationship competence, about half of the young participants responded that *security,* the mentor *shows respect for the mentee,* and the mentor *has an understanding of what the mentee is talking about* are important factors. Several students mentioned *being shown trust* as a significant factor in the guidance context, while other dimensions mentioned by several of the oldest respondents in this same area include the importance of *openness and honesty* as well as

mutual *respect.* These participants believe it is correlated with the mentor's allotment of sufficient time and possession of *a sincere desire to want to help the other.* In this context, the participants also mentioned that clarification regarding the actual guidance situation's expectations lays a strong foundation for one who is seeking such an effective relationship. Many students highlight the importance of *recognition* in that the mentor should *be supportive* and the mentee *must be allowed to make mistakes.* The mentor *must show understanding and see the individual's needs.* In situations wherein road searches are unsafe, the mentor must *show empathy and show interest in the individual's needs.* In addition, the mentor must be *gentle, attentive, sociable, caring, honest, sincere, committed,* and must *combine the academic and the social.* These qualities are expressed through a dialogic communication.

The participants highlighted body language as essential in communication in that *smiling and nodding along during conversation* should be included in the feedback. Several students highlighted the mentor's *ability to listen and have a sense of humour,* while many others mentioned that *the mentor must maintain eye contact and use the student's name.* One participant reported that the guidance situation should be perceived as *equitable even if it is asymmetric.* Several informants claimed that the mentor and mentee must be active, and the students hold the clear expectation that the mentor should *be willing to teach* and guide the mentee *in a positive direction.* The mentor's feedback must be characterized by confidence, trust, and the *affordance of mistakes.* Several students mentioned that the mentor must *be willing to help,* and by extension, several students believe there must be *mutual respect* and the mentee must experience *recognition.* Students in both groups highlighted the importance of *showing sincere interest* expressed through *looks,* acknowledging *nodding and questioning on the part* of the mentor. One participant mentioned that it is greatly important for the mentee *to be recognized as a person,* while several mentioned generosity as an element that should characterize the guidance situation while simultaneously holding the expectation of receiving from the mentor a *combination of academic and social knowledge.*

Discussion

Discoveries and Challenges of Guidance

Our survey confirms that relationships and relationship building are greatly significant regarding one's experience of effective guidance. For direct questions, as many as 58 percent of the respondents believe an effective relationship is greatly important, while 34 percent believe such a relationship is somewhat important. This result closely aligns with

the theory we highlighted earlier on that indicates relationships are important. The knowledge also provides a starting point for considering it important that relationship competence be included in the guidance context in both the teacher education programs and the guidance education programs. This consideration indicates that both mentors and students should know how to build effective relationships and how relationship competence can be practiced. A considerable amount of research (e.g., Hattie, 2017; Drugli, 2013; Nordahl, 2002) highlights the importance of relationships between teachers and pupils, which is a relationship additionally highlighted by the majority of students in our data. Elements of importance in building relationships were also highlighted, such as mutual respect, trust, openness, honesty, and an appreciative attitude. Our results demonstrate that certain challenges are presented to students when they are expected to experience these variables exclusively through digital guidance, although Lambeir (2004) argues that ICT offers opportunities for 'educational dialogue'. Although such a dialogue may be held, much of what is valid in the relationship and important in the guidance context are nevertheless marginally present.

Schibbye (2004) claims that recognition is something you have to develop, as an attitude, throughout the whole life. In this vein, what then happens when two mentors use the same words and have positive body language but are experienced differently by those who are guided? Killingmo (1998) touches upon this circumstance by focusing on what the mentor and mentee each bring into the relationship—be that experiences from previous guidance situations or simply the expectations of what benefit such situations should contribute, which is perhaps a consideration we might learn during our dealings with students. We must clarify what expectations both students and mentors hold for the guidance context, and these expectations can be clarified along different levels: on one hand, the expectation of a mentor's help in solving a task, while on the other hand, the expectation that one will become a safer student who supports one's views. The guidance situation's function is, among other things, to stimulate a student's learning (Løw, 2009), and the mentor–mentee relationship can be decisive for the amount of guidance provided to the mentee. Nordanger (2018) discusses the meaning of force and points to the importance of establishing an effective relationship characterized by empathy, flexibility, cooperation, and understanding.

In total, 95 percent of the young students believe knowing their mentor is greatly important. In addition, many wrote in their commentaries that security, trust, and being seen and listened to are essential features of an effective relationship. Students at the primary and lower secondary levels often head straight into upper secondary education and into an

academic environment. They experience an academic tradition in which they must argue their views and opinions, are required to critically reflect their research-based knowledge, and must make their assertions based on research from the field. It is essential that the mentor be confident in the role if one is to meet the student where he/she currently stands and not where he/she wishes to be. Schibbye (2004) argues for a subject–subject relationship in the guiding context, meaning the mentee should be met with an open-minded attitude, such as 'I wonder what you are thinking about', rather than a subject–object attitude, such as 'you must admit that what was not so wise', or a similar attitude in which the mentor points out when the mentee acts or says something against the mentor's expectations.

On one hand, defining an action or perspective in this way is characterized by Schibbye (2004) as relational abuse; on the other hand, a young student may expect specific advice from his/her mentor, who possesses knowledge of a particular situation from teachers practice. In such situations, it is also essential that the mentor and mentee discuss what guidance actually constitutes in order to help the counsellor find the way on his/her own. This point implies that we, as mentors, should be cautious when giving advice, but on the other hand, mentees may themselves, request advice from their mentors.

Several informants in our study express that an effective relationship is characterized by dialogue, active communication, considerable involvement and a body language that reflects positive attitude. Through mentors implementation of open-ended questions the mentee may for example reflect upon whether the solution or method was effective or ineffective, as well as what might be handled differently in a similar future situation. Rogers (1957) supports that we should acknowledge what the other individual in the conversation offers by expressing respect and accepting. This process is not always necessarily easy because the mentor brings his knowledge and cultural landscape into the guidance situation, while the mentee might bring an opposing perspective. Consciously or unconsciously, the mentor is characterized by his past experiences and ideas and who he/she is as a human being. According to Rogers (1957), it is important that the mentor exhibit his/her unconditionally positive consideration by setting aside his/her own thoughts and experiences and having the mentee fully in focus. On one hand when the mentor meets his/her mentee, he/she will establish given frameworks and guidelines, while on the other hand, the meeting will be characterized by the values and attitudes from both parts. This shows some of the complexity in guidance, and we cannot exclude the interpersonal perspective, which Nordanger (2018) believes may be of absolute importance for mentors to succeed as 'helpers' and contribute to their mentees' continued learning. A key question is therefore whether or

not technology can sufficiently safeguard the guidance. As researchers we are sceptical about technology`s effectiveness, yet at the same time believe it is important to meet today's young people in their arenas and implement tools that may ensure we reach as many learners as possible.

Guidance in Practice

A central element for those who are engaged in teacher education—whether that be basic or higher education—is that we meet our students with the knowledge of the importance of the relationships. Perhaps new students must actually learn to receive guidance, and the answers the 'freshest' students give may indicate that they are much more concerned with security, honesty, and patience than are their older counterparts.

If we are to succeed in strengthening students' self-experiences, guidance situations must be characterized by recognition. Rogers (1957) asserts that recognition and acceptance are some of the most fundamental in the face of the other. It is evident from our data that a reputable and understanding mentor is one variable that students consider in the description of an effective relationship. Perhaps not so surprising but nevertheless no less important is our observation that the recognition and establishment of positive self-experiences are prerequisites for building effective guidance situations. Listening both verbally and non-verbally to mentees by nodding or using small words was emphasized as important by several informants in our study. The mentor's attention directed towards the mentee by actively listening facilitates the latter's experience of being seen and cared about, and thus a mentor being genuinely present for his/her mentee during a meeting is therefore greatly important for the mentee's positive experience while seeking help. In addition to listening, it is important that the mentor ask thoughtful questions that make the mentee think, reflect and go ahead. The mentor role's complexity requires that one balance many thoughts at one time, especially while one is busy providing professional guidance in teacher education. In the future, for our part, balancing analogue and digital meetings will ensure the best possible growth and development for our future generation of teachers.

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BLOCKCHAIN ARHITECTURE IN SMART PEDAGOGY

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ABSTRACT

Blockchain architecture in Smart Pedagogy offers valuable social propositions like trust, identity, transparency, immutability, smart contracts and disintermediation. There are multiple practices how to record learners' achievements and present learning transcripts where the most common practices are university issued diplomas and vendor issued certificates. There are social networks which allow users to publish their learning achievements for possible stakeholders; however, the common problem is to verify if published diplomas and certificates are valid.

This study experiments with lifelong learning transcript called knowledge passport in blockchain architecture. The proposed scenario allows learners to publish evidence of their learning achievements in desired formats connected with blockchain network for instant authenticity verification. The experimental network consists of three nodes where one is located in Latvia, the second - in the USA, and the third - in Asia. Based on the proposed implementation, such approach much better validates learning evidence, eliminates knowledge passport fraud and reduces organizational workload overhead for stakeholders involved in verification of documents certifying a person's knowledge.

Keywords: Blockchain architecture, modern education, Smart Pedagogy.

Introduction

Smart Pedagogy promotes synergy between pedagogy and technology in the context of modern education. Computing and digital developments has brought proposed learning strategies for promoting learning in technologically enriched environments. There are studies on smart education, even developments of smart education systems that improve learning experience and strives for extension of learning resource availability anywhere, anytime in an individually prepared manner. One of the Smart Pedagogy higher-level domains are aspects that need to be considered in pedagogical processes – attitude, motivation, knowledge, diversity, assessment (Daniela & Lytras, Learning Strategies and Constructionism in Modern Education Settings, 2018). This study proposes blockchain

architecture as a decentralized database for storing learners' assessment results as lifelong learning transcript called knowledge passport. There are two main benefits in blockchain-based learning achievement design – first, instant authenticity verification if published diplomas or certificates are valid, second – adaptive learning customization for an individual learner based on previous assessment results.

Blockchain technology in one of its first proposals was introduced by W. Stuart Haber and Scott Stornetta in 1991 as computationally practical solution for timestamping digital documents, so that they could not be backdated or tampered with (Haber & Stornetta, 1991). Their initial work for time stamping a digital document relied on a central authority that had to record the date and time a certain document was created and store a copy of it. However, there was a problem of trust where authors acknowledged that nothing in this scheme prevents the time-stamping service from colluding with a client. As their original mission seemed impossible, they attempted to disprove the possibility of creating an immutable ledger but found an architecture that would not require a trusted central authority, so Stornetta and Haber succeeded in creating a distributed immutable ledger.

In 2004, a computer scientist Hal Finney introduced a system called RPoW, Reusable Proof of Work (Finney, 2004), Its main idea proposes a prototype for digital cash. RPoW solved a well-known double-spending problem by keeping the ownership of tokens registered on a trusted server where users via internet could verify token correctness and integrity in real time. RPoW is an important milestone in the history of cryptocurrencies.

In 2008, a paper for Bitcoin proposal was published – so far the most popular blockchain-based innovation called the first electronic cash system or digital currency (Nakamoto, 2008). Bitcoin is based on RPoW initial work, and it works as a decentralized peer-to-peer protocol for tracking and verifying transactions. Satoshi Nakamoto, the name under which Bitcoin article was published, is a pseudonym, and the real author or groups of authors are still unknown. It is interesting that Hal Finney participated as a receiver in the very first bitcoin transaction where he received 50 blocks from Satoshi Nakamoto, and so far he is the only one who has received bitcoin blocks from Satoshi Nakamoto (Bitcoin Transactions, 2019). Hal Finney has denied being Satoshi Nakamoto himself.

Digital currencies are only one of the cases when blockchain architecture is used. Blockchain is an incorruptible digital ledger of economic transactions that can be prepared to store not just digital currency transactions but virtually any valuable data stored in decentralized manner. If first blockchain developments were oriented to cryptocurrency, later developments focus also on smart contracts, and multi-field applications like healthcare, government services, science, culture and education. There are

common blockchain implementation features shared by digital currencies which can be used also for storing other valuable data within environment where there is no central server or certification authority. Possible internet-based peer-to-peer network connections and digital signatures sign/encrypt transactions need to guarantee:

1) participant-consensus validated transactions;
2) transactions irreversibility where it is impossible to cancel a transaction;
3) counterfeiting where it is impossible to print digital money;
4) double-spending where it is impossible to spend the same value multiple times.

There is a published review that compares consensus protocols for block-chain architecture with respect to their fault models and resilience against attacks. The protocol comparison covers Hyperledger Fabric, Tendermint, Symbiont, R3 Corda, Iroha, Kadena, Chain, Quorum, MultiChain, Sawtooth Lake, Ripple, Stellar, and IOTA (Cachin & Vukolic, 2017). Online central-ized single authority systems, blockchain architecture confirm data validity based on consensus protocol that in this research is selected to be Quorum for majority of stakeholders to control data provisioning and sequence.

Historically education systems use certificates, diplomas, transcripts, learning records or any other type of assessment evidence documents mostly in paper format to confirm learning and its results. Such learning evidence documents in real life follow both academic (where final awards may contain degrees) or specific skills-oriented commercial training where final awards may contain specific titles like a certified professional. Learning evidence documents include important data blocks like the issuer, date of issue, validity, signing person, learner's name/surname and qualification degree or title. There are no common standards for learning evidence documents, so each academic or commercial learning organization can design its own document version. It is possible to implement and use some security mechanisms as holograms (in paper documents they are rarely used because of more complex printing and additional costs). In comparison, paper money has much better anti-fraud mechanisms. From third party perspective, it is challenging to verify such learning evidence documents, as it requires individual efforts to identify and contact the issuer to confirm validity of learning evidence document. University diploma validity research (Contreras & Gollin, 2010) studies fake diploma problem. In modern education systems, digitally signed certificates replace paper learning evidence documents. For the learner, it is an advantage but for the issuer such solutions rise responsibility to secure the database and the signing key. In addition, such issuers might consider storing publicly accessible database for verification purposes (MikroTik, 2019) as digital learning certificates not only expire but also the issuer can revoke them.

This study supplements the existing blockchain development in modern education and experiments with a dedicated blockchain network connected via internet protocol with 3 blockchain nodes based in three different continents. The main idea of this study is to experiment with learners' assessment results as a lifelong learning transcript called knowledge passport in secure, independent, quorum supported blockchain architecture.   Although there are several proposals for digital proof of education certificates like unsecure simple PDF certificates, digitally signed PDF certificates or even digital currency-based (Bitcoin, Ethereum) proposals, none of them is accepted as general practice for presenting digital proof of learning evidence. This study is different from previously digital currency-based proposals, as it is using different, independent architecture controlled by education stakeholders with no need to pay settlements to digital currency miners for block confirmation. Each of blockchain architecture implementation domains has its own specifics that requires research and opportunities for innovators. Available blockchain-based ideas and appropriate studies for education domain are reviewed in the following section. The experimental setup description follows in the third section of this study. Experimentation results are presented in the fourth chapter of this paper, and the conclusion and future research proposals close this study.

Related research and developments

As of June 2019, there are dozens of universities offering studies of blockchains, cryptocurrencies, distributed consensus, smart contracts and applications. For example, University of California At Berkeley, Stanford University, Massachusetts Institute of Technology, IT University of Copenhagen and University of Nicosia – Cyprus offering MSc Degree in Digital Currency (UNIC, 2019). Students of University of Nicosia who successfully qualify will receive their academic certificates whose authenticity can be verified through the Bitcoin blockchain as presented in Fig. 1 (Nicosia, 2019).

Since July 2017, as part of its ongoing innovation around blockchain, the SAP innovation Center Network have introduced TrueRec - a secure and trusted digital wallet for storing professional and academic credentials powered by blockchain. These credentials could include anything from IDs, such as passport, driver's license, or voter ID, to education credentials like university degrees and employment certificates. TrueRec is powered by Ethereum, an open-source, public, blockchain-based distributed computing platform that features smart contract (scripting) functionality that facilitates online contractual agreements (SAP News Center, 2019).

Figure 1. Nicosia MSc academic degree certificate verification

Since October 2016, Blockcerts proposal for open standard for creating, issuing, viewing, and verifying blockchain-based certificates contributes to the prototype developed by MIT Media Lab and Learning Machine initiative group. Blockcerts use Bitcoin blockchain as the provider of trust, and credentials are tamper-resistant and verifiable. Blockcerts can be used in the context of academic, professional, and workforce credentialing. At its core, Blockcerts is open code software (Blockcerts, 2019). Blockcerts relies on Bitcoin complexity and immutability as important and careful consideration for long-term effects. Sample Blockcert digital certificate verification is presented in Fig. 2 (Learning Machine, 2019).
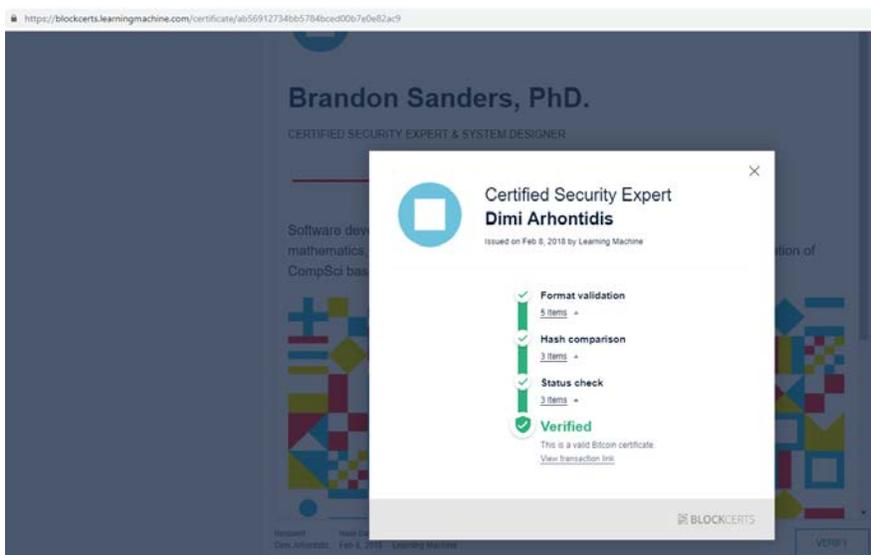
Figure 2. Blockcert digital certificate verification

Among recent studies focusing on blockchain, there is a notable initiative by Gräther et.al. proposing Lifelong Learning Passport solution for education domain. In Gräthers study first, author describes the conceptual system overview and presents in detail the platform implementation including management of certification authorities and certificates, smart contracts, as well as services for certifiers, learners and third parties, such as employers. Finally, author describes use-cases and first evaluation results gathered from end user tests with certifiers (Gräther, et al., 2018). Gräther platform is based on Ethereum contracts and is limited to OpenZeppelin approved smart contract templates

Blockchain featuring Smart Pedagogy

The core idea of smart pedagogy as technology-enhanced learning promotes meaningful usage of state-of-the-art technologies in transforming learning environments. Smart pedagogy can support educators in finding the answers on how to support learning in the transformed education process, how to incorporate technologies into learning to support the development of metacognition, how to support knowledge building, how to support the development of digital competences (Daniela, 2019). Novelty is not the only common characteristic shared by blockchain and smart pedagogy. This study proposes blockchain architecture as technology-enhanced learning advancement for the following benefits:

1) Lifelong learning transcript called the knowledge passport. There might be doubts because of privacy and other reasons regarding who and in what detail should be able to observe learners' achievements and results. Most often a learner would share his/her final learning result evidence document with third parties. However, it can be beneficial both for the learner and educator to zoom in the learner's assessment results on a subject or even topic level. Depending on the learners and educator's agreement, technically the knowledge passport could contain results of all assessments ever taken by the learner. Blockchain architecture serves as a decentralized platform for storing hashed references to recorded learning results as stored in a distributed secure network that does not allow data tampering. For example, if the learner demonstrated poor results on a topic and later repeated the test with better results, the knowledge passport would store both the old and the new result. Having access to a trusted learner's lifelong knowledge passport, educators could prepare a more individualized learning content and approach. The learner's knowledge passport provides the ability to predict the best teaching approach and select the right tasks in the right order. Emphasis on

the importance of a comprehensive view from strategic perspective on what and how learners will gain knowledge now makes it possible to evaluate progression and results between short-term gains in understanding and longer-term education goals. The proposed smart pedagogy blockchain is distributed between multiple education organizations, and it shares a single knowledge passport of the learner. Usually when an individual enters an education institution, there is a new, empty record to store the learner's assessment success. Upon an agreement between the learner and the education organization, all learning data would be available to the educator resulting in much more individualized learning content and approach. From scientific perspective, the knowledge passport not only boosts the learner's learning abilities but its analysis reveals more comprehensive trends about the learner, educator and the education organization. Such analysis based on empirical data would help to ask and answer new research questions.

2) Validation of learning result certificates. Like in the proposals discussed in the related research section of this paper, validity of learning evidence documents can be organized in blockchain architecture in multiple ways. If the documents reviewed stored validation data in cryptocurrency blockchains in order to meet smart pedagogy flexibility requirements, the author of this article proposes to build independent blockchain network shared among education institutions capable of smart pedagogy. Using independent blockchain designed primarily for education tracking purposes, allows learners, educators and education organizations to decide on the desired formats and processes without cryptocurrency framework limitations. In the next section of this paper, three nodes of an experimental network in different continents are connected using internet protocol over public internet. A notable part of national research and education organizations from Europe are connected to GÉANT network (GEANT, 2019). GEANT, the Gigabit European Academic Network, is a panEuropean data and communication network for Europe's education and research community. It is co-funded by education networks, European national research and the European Commission, and coordinated by a limited liability company DANTE. Across the European continent, the GEANT network provides research data communication, infrastructure and resources for telecommunication and information technology development. An organization connected to GEANT network, thanks to border gateway protocol on internet core smart pedagogy blockchain, would benefit from transit data flowing directly between interconnected education organizations.

Experimental setup and data structure

As in Fig.3, the experimental setup consists of three blockchain nodes located in Latvia, USA, and Singapore. All three nodes are logically fully meshed and physically connected via an internet protocol over public internet. If all nodes were connected in national academic institution networks with active GEANT connection, then blockchain data exchange would transit only GEANT network.
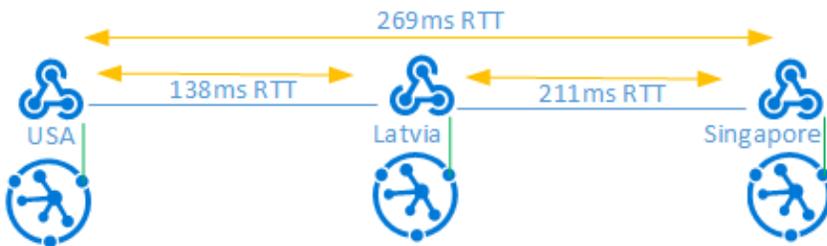
Figure 3. Blockchain node location and interconnectivity

All three blockchain nodes synchronize the blockchain database starting from genesis block followed by subsequent sequential blocks. The proposed architecture with three nodes is the smallest setup to demonstrate a decentralized peer-to-peer system with no central authority figure and quorum consensus. Blockchain nodes are located in different continents to observe real-life experience in realistic network for future smart pedagogy applications. Each node represents education institution and can append learners' achievements to blockchain as data in new blocks. After appending data to blockchain, it is not possible to delete or tamper with such data unless the whole blockchain is deleted. Depending on necessity, blockchain may contain not only academic or commercial final certificates issued at the end of learning process like degrees or professional titles but also more detailed assessment results on a subject or even topic level. Additional to digital certificate data, blockchain stores data creation timestamps. If the learner completed any assessment for the second time and results were published in blockchain, then all other nodes would have both the previous and actual assessment values for the same learner but with different timestamps. Considering future scaling, it is advised to store smart pedagogy centric data as links to education organization databases that get validated by corresponding hashes in blockchain network. However, it is possible to store smart pedagogy centric data also as raw data directly in blockchain for redundant storage on processing on other nodes. As in table 1, the proposed blockchain database architecture contains five columns

where data field carries information about education organization, such as the creator, learner's profile, assessment type, result, timestamp.

Table 1. Proposed blockchain structure

index	previousHash	timestamp	Smart Pedagogy data	hash

Index – integer, e.g. 1;
previousHash and hash – double SHA256;
timestamp – unix timestamp, e.g. 1536851684.824;
data – varchar/string

Figure 4 shows general overview how smart pedagogy blockchain meets stakeholder interests. The learner demonstrates his/her gained knowledge through assessments. Recorded results for specific topics or subjects depending on an agreement between the learner and educator may be published as hashed smart pedagogy centric data in blockchain. Educators can access the learner's learning transcript and prepare appropriate methods and tasks to maximize the learner's learning abilities. When the learner has passed all assessments, education organization publishes a hashed digital certificate in blockchain. Once the digital certificate is published, the learner can share a link to the learning evidence to any third-party stakeholder who can directly validate the learners' success.
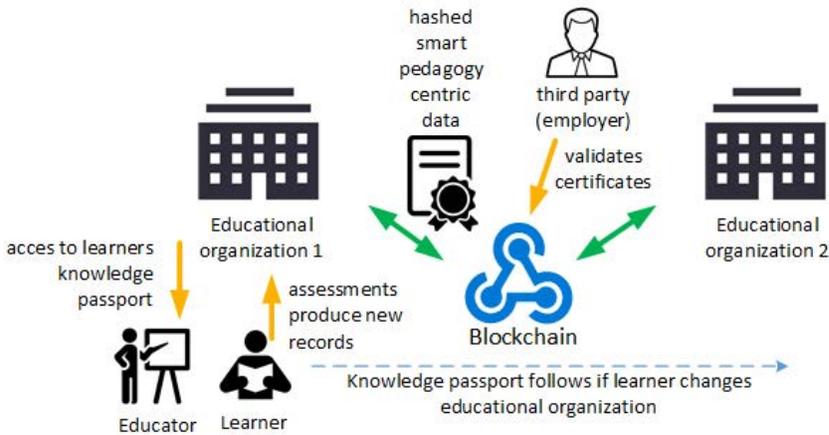
Figure 4. Smart Pedagogy blockchain stakeholders

The experimental process was divided in two steps. First, independent blockchain setup with three nodes and hashed digital certificate exchange. The main research question for the first experimental step was to answer what is difference between an independent blockchain approach

compared to practice where certificate hashes are stored in blockchains of cryptocurrencies Bitcoin or Ethereum. As this proposed blockchain is designed only for processing smart pedagogy centric data, it has simpler and clearer database structure, and it performs better. During the experimentation, three imaginary education organizations generated 100,000 digital certificates each resulting in 300,000 digital certificate entries. Such volume of blockchain entries was chosen for comparison with Bitcoin daily transaction count (Blockchain Charts, 2019). With a single server blockchain solution in each node, it took approximately 3 hours, where average block confirmation time was approximately 20s compared to average 12 minutes in Bitcoin network in corresponding timeframe on June 26, 2019. On the other hand, Bitcoin network has more than 500,000 unique addresses and higher mining difficulty (Blockchain Charts, 2019). To sum up, independent smart pedagogy centric blockchain brings better performance and flexibility but will need more nodes to increase consensus quorum and security guarantees.

During the second experiment, the author generated and published 10,000 subjectbased assessment results on each blockchain node. Randomly generated data contained 100 educator id values and 1,000 learner id values on each node thus modeling a scenario where 1,000 learners in each educational organization get assessment in 10 subjects. Identification values of the education organization, educator, learner and the subject together with assessment result and timestamp were stored in a data field in blockchain. 30,000 generated entries were confirmed and distributed to all three nodes within 30 minutes. Now with available dataset, interested stakeholders can evaluate best students, best educators and analyze learners' knowledge passports and develop technology-enhanced learning innovations from smart pedagogy perspective. Transparency of success of learners and educators may lead to better rivalry among education organizations.

Results and conclusions

On the basis of experimentally collected evidence and dataset, the author concludes that blockchain architecture can be beneficial for the smart pedagogy domain as perspective to develop technology-enhanced learning innovations that use learners' lifelong knowledge passport. Although currently only minority of education organizations issue digital certificates instead of paper format learning evidence, author believes that in the future digital certificates will gain popularity. Depending on the choice of education institutions, digital certificates can be stored not only in cryptocurrency blockchains but also in specially designed blockchain

for the education domain. The proposed blockchain architecture for smart pedagogy is in prototype state and for now can be used to demonstrate the idea of blockchain contributing to smart pedagogy and being another step in development of infrastructure with innovative benefits.

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AN APPLICATION OF THE MODERN TECHNOLOGICAL SOLUTIONS IN AN ORDER TO ENHANCE THE PROCESS OF DISTANCE LEARNING

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ABSTRACT

An approach to the development of modern process of distance learning in the higher education requires application of modern tools and technologies. It is a known fact that distance learning is mainly online and has become a synonym of a technological progress and globalization development. However, a long time experience of working with distance students and gained feedback during a communication process made it necessary to discuss a statement: modern distance and online education must become more communicative and flexible, ensuring fast connectivity, a possibility to assess students' needs and individual approach.

The theoretical framework of the article includes the analysis of an increasing role of the communication process in the distance education. A method of application of learning solutions based on the experience realms model in order to improve student's retention for distance learning is considered as a tool in an order to retain a distant student. The study consists of the introductory part, where main prerequisites for the application of modern technological solutions in order to retain a student are given, and theoretical part where postulates of Experience Economy are analyzed and present researches related to the topic are over viewed. Methodological part is presented with an observation of existing communication tools for distance learning and methods of its application in order to retain students' attention during the process of distance learning; conclusions where main findings are summarized and proposals of offered methods and technological solutions in order to retain a student for distance learning are given.

Keywords: Distance Learning, Communication tools, Technological solutions.

Introduction

The world is experiencing a paradigm shift, and higher education is no stranger to it (Black, et al, 2019).

Modern higher education establishments, especially private educations of the Baltic States are currently experiencing hard pressure from the open education market of the other members of the European Union on the one hand and repercussion of demographic and migration crisis on the other hand. For example, Hudenko (2019) mentions a survey, made by the University of Latvia where main category of those representatives of population of Latvia that had a desire to leave the country in the year 2016 consists of young people aged 18–24 (33% of participants of the survey). Altogether Latvia was left by 67 thousands people during the years 2013–2017. Both Latvia and Lithuania each had lost among 20% of their population during the years 2000–2017 (Hudenko, 2019). The disappearance of youngsters means consumer decrease for education market of the Baltic countries.

Distance learning tools impressively contribute to the competitiveness increase and horizon enlargement for Higher Education Institutions (HEIs) of the given region. Most of modern education establishments are equipped both with hardware and software to support the process of distance learning.

It is possible to study anytime and anywhere nowadays thanks to the dissemination of various online educational platforms, such as Moodle and others. However, the authors' long time experience of working with distance students and gained feedback during the communication process created a necessity to discuss a statement: modern distance and online education must become more communicative and flexible, ensuring fast connectivity, a possibility to asses students' needs and apply individual approach. A student presently located perhaps thousands kilometers away from his/her Alma mater should be especially encouraged for learning and should constantly be supported. That is why not only the contents of distantly offered study courses should be seriously examined, but the common approach of study subjects delivery – how easy it is to accomplish tasks, to obtain theoretical materials as well as how fast, smooth and clear the communication process is performed, with three sides being involved – a HEI, playing a moderator and a controller's role, a tutor and a student.

Aim of the study

The object of the research are 96 higher education institutions of the Baltic States, mostly focused on provision of social sciences such as

Business Administration, Tourism etc. (Dehtjare, 2019, p.113). The subject of the research is retention of distance learning students and according application of technological solutions in order to keep students satisfied with the study process and communication.

Research problem is determined with present worsening of demographic conditions of the Baltic States and existing desire of local targeted auditorium of HEIs to leave the region. Thus, competitiveness within the HEIs of the region increases and dissemination of such a service as distance learning both for local and overseas students could become a significant competitive advantage. However, it is never enough to launch a product (or service) on a market, a communication has to be qualitative and a service provider (here: HEI) should keep its consumer (here: student) satisfied during all period of consumption (here: distance learning process). That is why a hypothesis of the research should be formulated as follows: distance learning is a product that could contribute to the increase of competitiveness and there should be applied most of modern technological solutions in order to keep the consumers (students) retained within the process of product consumption.

Merriam-Webster dictionary (2018) gives following definition of distance learning: "a method of study where teachers and students do not meet in a classroom but use the Internet, e-mail, mail, etc., to have classes" (Merriam-Webster Dictionary, 2018). Also, Cambridge Learner`s Dictionary (2018) defines the same process as "a way of studying, especially for a degree, where you study mostly at home, receiving and sending off work by post or over the internet" (Cambridge Learner`s Dictionary, 2018). Learning by post being already some kind of a relic of the past, both dictionaries agree in defining distance learning process as a process where both participants are separated from each other. As it is stated above, the depressive stagnating situation among the HEIs of the Baltic States who had faced both open EU educative market competitive advantages and according threats altogether with speedily decreasing population puts these HEIs into tough surviving position. Being currently unable to ensure increase of the domestic students due to the lack of their presence in the region, the HEIs are especially interested in expanding their areas of functioning. Distance or online (most often synonymous nowadays) learning provides great possibility for this purpose. The authors suppose postulates of Experience Economy model, stated by Pine J. and Gilmore J. (as cited in Bornschlegl & Cashman, 2018, p.62) could be applied also as a tool to retain students' attention during their participation in a process of distance learning. With regards to education process, the selling of education products (here distance learning of study courses, services offered for sale) should be enriched with selling experience. While a customer uses

a product, an experience occurs. Tangible products and intangible services are still external to the buyer; for all that the experience is deeply personal. There are no two people with the same experience of equal product usage as their motivation is individual and not only extrinsic but intrinsic.

One way to think about experience is across two dimensions. The first dimension corresponds to customer participation. Formal, obsolete approach for distance learning means very little involvement of both students' and tutor's in the process of distance learning and communication related. Active approach of communication and according rise of experience is observed when most of communication tools are used during the distance learning process and students feel themselves highly involved and supported both by their tutor and a HEI. The kind of experience most people think of as entertainment, applied in education process, tends to be that in which customers (here: students) participate more passively then actively (for example watching live or recorded stream of in-class lecture), their connection with the event (here: lecture material to be achieved) is more likely on of absorption than of immersion.

Educational events, such as attending a virtual webinar, tends to involve more active participation, yet students are rather outside the event than are immersed into the action. Escapist experience can teach just as well as educational events, or amuse just as well as entertainment, but they involve greater students' immersion. Recorded and submitted acting in a play with an aim to simulate application of personal selling skills and then followed online discussion with a tutor and perhaps with other students in a virtual conference mode, for example, involves both active participation and immersion in the experience. However, if the student's active participation in the process of distance learning is minimized, an escapist event becomes an experience of the fourth kind—the aesthetic. Here customers or students in our case are immersed in an activity or environment, but they themselves have little or no effect on it like watching recorded video lessons. Experience, similar to goods and services should meet a need of a customer. Still, experience is born in a process that requires direct buyer's involvement, absorption of the running process or deep immersive dive into it. The model of Experience Economy formulated by Pine and Gilmore (as cited in Bornschlegl & Cashman, 2018, p. 63) describes buyer's involvement into the process of products or service consumption as an active or passive participation within four areas (realms) of an experience. Four areas of buyer participation and involvement aspects, such as education, entertainment, esthetic and escapist are considered to be located in between horizontal axis (where absorptive involvement is on top and immersive is below) and vertical axis (with passive participation on the left and active participation on the right).

Bornschlegl & Cashman (2018), scientists from James Cook University, Australia, reported about the results of a research, which aim was to study if there is a correlation between students' satisfaction with a process of distance learning and their retention in study process, simple mediation model being applied. They stated:

The distance student experience and the students' satisfaction with crucial program factors were strongly indirectly related to the students' intention to persist through the students' overall satisfaction. The results indicate that designers of tertiary distance courses should consider program factors and the characteristics of the distance student experience to ensure high levels of student satisfaction and to increase the students' intention to persist (Bornschlegl & Cashman, 2018, p. 73).

Analyzing the Four Realms model, Bornschlegl & Cashman (2018) suppose:

The Experience Economy model could make important contributions to the understanding of distance student retention. It could clarify the relationship between program factors, satisfaction and retention taking motivational theories into consideration. The educational literature contains little research that is directly analogous to Pine and Gilmore's. < … > More broadly, the literature has not considered the student experience as a whole within the student retention process. These realms seem, however, important for their motivational value (Bornschlegl & Cashman, 2018, p. 62–63).

Materials and Methods

A method of application of learning solutions based on the experience realms model was offered by the authors in order to improve students' retention for distance learning, based on Pine and Gilmore's Four Realms Experience model (as cited in Bornschlegl & Cashman, 2018, p.63) and own practical experience with online tutoring and thanks to the introduction of modern technological solutions into the existing distance study processes of their referred HEIs altogether with theoretical review of online sources and existing scientific publications.

Main idea of the method is that during the process of distance and/or online learning every experience realm must be fully involved to keep maximum of students' attention. The method includes application of learning solutions – for distance learning process. The authors suppose the application of a model of Four Experience (4Es) realms application for distance learning will lead both to students' retention and respectively to competency increase for related HEIs.

Table 1. A Method of Application of Learning Solutions – Based on the Experience Realms Model in Order to Improve Students Retention for Distance Learning (offered by authors)

	Experience Realms			
Realm/ Involvement role	Educational	Entertainment	Aesthetic	Escapist
Absorption/ Active	Remote familiarization with educational materials and assignments			
Absorption/ Passive		Watching of uploaded/sent educational videos, broadcast/ recorded webinars		
Immersion/ Passive			Design of a website, online platform, study materials, presentations, easiness of usage	
Immersion/ Active				Virtual reality, augmented reality, role plays, quests, online games, online conferences, chat bots, messenger, social networks
Communication approach (tutor/student/ HEI)	Formal	Formal	Formal	Formal and informal

Remote familiarization with educational materials and subsequent writing performance of study assignments is traditionally disseminated method and a trustful way to ensure a student with information of an offered study course, its content and objectives. Such a process of obtaining information as reading is ensured with little from both sides communication

and sometimes even lower ability to interest a remote student, however, the absorption is high as obtained competence should be proved by suggested tasks to be accomplished afterwards.

Entertainment is an important component used in order to retain student's attention and to keep satisfaction. Videos related to topicality of studies, recorded live lectures and webinars keep attention, however, a remote student still plays passive role during watching.

Communication process plays an important role in the distance learning, application of as many as possible communication solutions and tools is also crucial in retaining a student. Communication ensures active student's involvement and according immersion into the study process altogether with continuous satisfaction and feeling of a support both from a tutor and from HEI in general.

Clemons (2005) outlines: "online educators navigate technology challenges that traditional classroom teachers rarely do. However, their goal of enhancing student learning through an enriched environment is the same" (Clemons, 2005, p.7).

Solutions offered for the application in order to retain students during their process of distance learning are overlooked in Figure 1. There is a necessity to ensure multiple ways of communication for three participants of the process, a tutor, a student, a moderator (intermediate, study department representative of HEI).

The role of the moderator and his/her contribution to the communication process shouldn't be underestimated. Some education establishments and online platforms often skip moderating action or consider it less significant, however, there is still a necessity to ensure such a position. A qualified moderator of online study process is able to:

- control learning, provide explanations on operation functions, communicate with participants regarding their study debts, monitor those with frozen activity, remind and make overall statistical monitoring of student activity with according conclusions and process improvement suggestions;
- communicate with tutors, provide explanations on operation functions for them, control tutors activity, remind and make overall statistical monitoring of tutors' activity with according conclusions and process improvement suggestions;
- download study materials into education platform or help tutors to ensure this action, provide trainings for tutors how to operate within the system;
- communicate with study department to ensure systematical notification about obtained evaluations for study courses passed by students;

- monitor existing contents of study courses downloaded to the platform, control its quality, contact tutors, remind them to make updates of contents;
- add supporting materials;
- communicate with responsible IT specialists and network administrators to ensure stable online platform function.

The approach to modern distance learning should combine both formal and informal communication. Formal communication includes online learning with a help of educative platform, use of a website, printed manuals etc. Informal communication ensures smoother and faster interaction and helps to customize the process. Messengers, social networks could be used as the tools of informal communication altogether with the standard communication devices and tools. In accordance with the Four Realms model, informal communication tools help to retain customer's (here – student's) attention, having both absorptive (requires intrinsic motivation to obtain knowledge) and immersive (requires own physical action and presence, even a virtual one) importance.

The following tools of formal and informal communication for distance learning to be applied in order to retain a student can be offered:

- **Online educative (e-learning) platforms**, such as Moodle, Bamboohr, E-learning Platform and others (GetApp, 2018). An online learning platform is an integrated set of interactive online services that provide trainers, learners, and others involved in education with information, tools and resources to support and enhance education delivery and management (SAP Litmos, 2018). Moodle cloud allows you to access all of special applications and services from anywhere, anytime via the internet, because the information stored on the main server (the company service provider) (Basha et al., 2019, p. 40). Among the advantages of educative platforms there are: 24/7 accessibility worldwide, both tutors and students activity monitoring, ease of usage, update flexibility. However, there are several disadvantages that make this study process rather formal, such as often delay in communication between tutors, students and moderators, complicated operation, formal approach of creation of study materials due to which distance students often complain to limited information amount received comparing to full time students. There is a possibility to ensure direct chat communication between tutors and students but it usually accompanies with significant delay with answers. It is necessary to emphasize that modern educative platforms have to include mobile versions due to nowadays market requirements. Still not many of them offer such a solution. Other trend is to use elements of Augmented Reality (AR) in a process of

distance learning. Zumoko (2018) supposes, that elements of AR in education and according learning solutions help students to "visualize complex and abstract data to achieve deeper understanding and increase knowledge retention" (Zumoko, 2018, para. 2).

- **Website** of education establishment that can be used as a support of educative platform, containing uploaded resources, links to study materials etc. It is possible to ensure two-way communication thanks to chat bots; however, it is not a common thing for education establishments, such as colleges and universities. Still implementation of a chat bot can help to customize communication process between a student or an applicant and education establishment, to make it smoother and more pleasant. During the research 96 websites-of the universities of the Baltic States were investigated by the corresponding author (Dehtjare, 2019, p. 113), and it was a problem sometimes to find a necessary information about study programs or where to find methodical materials etc. Chat bots can simplify process of obtaining information at once;

- **Email communication** is a good helper in ensuring communication process, though not the best one. Initially, "the use of emails has revolutionized the way teachers communicate with their students" (Gonsalez, 2010, p. 2). The advantages of email communication for study process are its speed, accessibility, mobility and a possibility to forward attached materials. The disadvantages are possible delays and even lost in spam folders for group sending and often exclusion of study process moderator away from the communication process between a tutor and a student;

- **Phone and internet voice call providers (such as Skype etc.)** are long time known tools to ensure smooth and personalized distance learning process. This function is often supported by video broadcasting. While study materials available for obtaining by e-learning platforms are a useful but still formal tool, broadcasting communication is a perfect way to ensure personalized approach. A student feels more valued and supported when listens to a voice of his tutor and sees video with him, this, indeed, is much more appreciated and feedback is almost guaranteed. Moreover, the broadcast translation can be recorded and later downloaded to e-learning platform as a supported material. It can become later available for downloading as a promotion element for prospects and interested students, or even sold as a separate audio or video study course. Thanks to globalization aspect of modern technologies, video conferences, webinars can be broadcast, recorded and disseminated throughout the world. For example, Tajbiul (2018) outlined that

"education in distance mode by broadcasting media is still most convenient and cost effective to expand and ensure education for all" (Tajbiul, 2018, p. 1.);

Educative message // Feedback Communication process

Information Sending / Recieving Tools
- Educative platform (eg., Moodle)
- Website
- Email
- Messenger (WhatsApp, Telegram, etc.)
- Social Networks (Facebook, etc.)
- Phone and Internet voice calls (Skype, etc.)
- Online broadcasting
- Cloud services
- Printed Information kit
- Block chain Technologies

Tutor

Student

Intermediator / Moderator
(HEI study department)

Figure 1. Communication Process Solutions for Distance Learning (designed by authors)

- **Messengers, such as WhatsApp, Telegram** and others are modern, powerful and often underestimated personalized communication tools. The advantages of these tools are their high personalization, possibility to organize and manage group chats, option to share files, option to make live broadcasting and record it, an excellent opportunity to contact a student who doesn't show any signs of activity for a while anytime and anywhere, being sure he/she has got the information as a delivery report is seen immediately. It is also a perfect tool to give to a distant student a sense of appreciation and support by an education establishment. These tools are supported by mobile devices. As stated by Pucciarelli & Cantoni- (2012), p. 5, "mobile devices may be a convenient source of information and tool for communication in order to support formal and informal learning".
- **Social networks (Facebook etc.).** It's a known fact the Facebook Empire has grown from an internal network of Harvard College (Brandwatch, 2019). It is hard to underestimate its meaning in the modern life and communication process. However, its application for distance learning is very little appreciated by the education establishments. Facebook groups, pages with link to information,

possibility to share information within a click, chats, interactivity – these advantages of social network must be fully used by a university or a college;

- **Cloud services.** The cloud promotes more efficient use of IT resources, such as a reduction in costs, human resource savings. Cloud services can contribute to creation of common data base of several establishments, especially if double or joint diploma programs are provided. These technologies could be used in appliance with other formal communication tools;

- **Kits of printed information.** Even despite the fact that nowadays technologies contribute to fully automatized and online effectuated study process development, still getting of printed information materials (prospects, booklets, reminders, questionnaires, test books, manuals) makes a distant student feel supported. Sometimes this old school tool can contribute to the communication process as well;

- **Blockchain technology**. Modern scientists observe many possibilities of block chain technology in the process of education. It should be especially evaluated as a useful tool in a distance education as it enlarges many capabilities at once. For example, digital diplomas could be issued thanks to this technology altogether with a "digital badge", a summary of all courses and modules obtained throughout lifelong learning process. This virtual badge could be shared online and be used as a confirmation of statuses for human resource representatives and other interested persons. The blockchain ledger can match all kinds of educational information with the user's unique ID. It includes learning behavior in class, micro academic project experience, and macro educational background, etc. (Chen, Xu & Lu, 2018).

As formulated by Sharples (2018), the education approach in the Mobile Age should be re-shaped taking into consideration both conversational and technological factors. Regarding the nowadays education, it removes the solid ground of classroom instruction, and of education as the transmission or construction of knowledge within the constraints set by a curriculum, and replaces it with a cybernetic process of learning through continual negotiation and exploration. This can be seen as a challenge to formal schooling, to the autonomy of the classroom and to the curriculum as the means to teach the knowledge and skills needed for adulthood. But it could also be an opportunity for technology to bridge the gulf between formal and experiential learning (Sharples, 2018, p. 8).

Results

The research findings show: 1. Demographic decrease and open market of education means high competitiveness for the HEIs of the Baltic States. 2. Distance education tools impressively contribute to the market share increase and horizon enlargement for HEIs of the given region. 3. Distance learning must become more communicative and flexible, ensuring fast connectivity, individual approach and a possibility to asses student's needs. 4. The selling of education services should be enriched with selling experience. 5. A method of Four Experience realms application solutions for distance learning has been designed by the authors. 6. The approach to modern distance learning should combine both formal and informal communication. 7. Technological solutions to ensure both formal and informal communication process for distance learning have been offered by the authors. 8. Offered methods and solutions should contribute both to students' retention and their overall satisfaction with distance learning process that will lead to competitiveness increase of the related HEIs.

Conclusions

The development of the Internet and communication technology has revolutionary changed the education contents and methods. Due to current demographic decrease in the Baltic States together with open education market of the EU, the HEIs of the mentioned region are experiencing high competitiveness pressure. Dissemination of distance learning could become a key to market share expansion for offered educational services and a tool to competitiveness increase. However, the efforts to retain a student within a process of distance learning should be maximized. To achieve this, the authors of the research propose their recommendations for student's retention during distance learning process, based both on application of Four Realms of Experience model together with formal and informal communication approaches and modern technological solutions.

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DEVELOPMENT OF METACOGNITION AWARENESS SCALE FOR 10TH–12TH GRADE

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ABSTRACT

One of the goals of the Latvian National Development Plan is to reduce the proportion of students with low cognitive skills, and at the same time increase the proportion of students with high level cognitive skills by the year 2020. In line with this goal, National Centre for Education has initiated a curriculum and educational assessment system reform. It is important to create assessment instruments for both: subject specific content and 21st century skills, which are integrated in the learning outcomes in the revised curriculum. The aim of this study was to develop and pilot a new metacognitive awareness scale for 10–12 grade pupils. The instrument was based on the structure of the Metacognitive Awareness Inventory (Schraw, & Sperling, 1994), creating new items and making them specific to the content of national level large-scale assessment in Science. A total of 1,257 pupils (48.4% boys, 51.6% girls) aged M = 15.30 (SD = 0.53) participated in the study. To find out the pupils' metacognitive awareness factors, 35 statements about different metacognitive activities were developed. Factor analysis showed good structure of 3 factors – planning, monitoring, and evaluation, but weak structure of other possible factors. Internal consistency of the overall scale was good (α = 0.92). Discrimination and difficulty index levels meet accepted psychometric criteria. After multiple iterations, confirmatory factorial analysis revealed that 9-item model had good fit and good structure of three components: planning, monitoring, and evaluation.

Keywords: metacognitive awareness inventory, cognition regulation, exploratory and confirmatory factorial analysis.

Introduction

Employment distribution over the last years has shifted towards jobs with high and low non-routine skills. High skills encompass problem-solving, abstract reasoning, and decision-making, but low skills demand basic human adaptability (Dorn, 2009). In manufacture, a very similar trend prevails, where a shift from large numbers of low and medium

skilled jobs to smaller number of high skill jobs for the same output is observed (Timmer et al., 2014). There is no lack of jobs in the market, but the jobs being created demand a higher level of skills, than the jobs which have been lost (Wiliam, 2018).

Therefore the Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD) states one of the key indicators of the K-12 education system quality the proportion of students which is below Level 1 (students cannot recognise basic aspects or simple phenomenon) and the proportion of students, who have reached Level 4 and Level 5 (students demonstrate full and detailed understanding of phenomenon, abstract and complex thinking skills) (OECD, 2016).

One of the goals in Latvia for the Education Development Plan Year 2014 – Year 2020 of the Ministry of Education is to reduce the proportion of students with low cognitive skills (especially student proportion below Level 1) and at the same time to raise the proportion of students with high cognitive skills. In line with these goals, National Centre for Education has lounched a comprehensive curriculum reform applied to the learning system from kindergarten to the 12th grade, prioritising 21st century skills such as problem solving and critical thinking, communication, collaboration, civic participation, creativity and entrepreneurship, digital literacy and self-regulated learning. The content of the curriculum has been organized in seven learning areas: languages, social sciences, cultural understanding and artistic self-expression, natural sciences, mathematics, technology, and health and physical activity with complex learning outcomes which integrates understanding, skills and attitudes (Regulations Regarding the State Standard in Basic Education, the Subjects of Study Standards in Basic Education and Model Basic Educational Programmes, 2018).

In the research there is a growing evidence that students with better self-regulated learning skills tend to learn better and with less effort (Zimmerman, 2000). Self-regulated learning consists of controlling learning environment, setting goals, choosing and using appropriate strategies and monitoring progress towards goals. Self-regulated learning consists of three components: cognition, metacognition and motivation. As various authors conceptualize metacognition construct, consisting of two subcomponents: knowledge and regulation of cognition. (Schraw et al., 2006).

Metacognition has been a priority in the research literature as one of the key factors which positively influences student achievements and learning outcomes (Dignath & Büttner, 2008). In the last years scientific studies in the metacognition examines not only laboratory settings, but also classroom settings (Veenman & Alexander, 2011).

In additional metacognitive knowledge and skills seem to be related to the successful transfer of learning and deeper problem pattern

recognition. When experts find themselves in a new situation without specific knowledge and experience, they are prone to use a more general strategy to solve the problem. Self-knowledge can be both a facilitator and a constraint in such situations. There are several interconnections between metacognitive knowledge, learning, teaching, and assessing, which are difficult to separate. Most often teachers assume that students could acquire metacognitive knowledge on their own, but in this case this assumption is wrong. Only some students are able to acquire metacognitive knowledge through experience. However even a separate course is not an effective way to develop metacognitive skills. Such strategies should be embedded in the subject practice. In terms of assessment, its process is more informal and is revealed through conversation and observation. In some cases, it is possible to use more structured interviews and questionnaires (Pintrich, 2002).

Effectiveness of metacognition in student learning outcomes and well-being is firmly stated in research, but there is little evidence that schools are using such metacognition strategies universally. The central goal is to understand the effect of use and assessment of metacognitive strategies with the view to improve student learning outcomes (Perry et al., 2019). The key distinguished criteria between students who use metacognitive skills and students who don't is a consciousness way to solving new problems. When students are confronted with a new novel problem they cannot rely on the algorithm. Students who often find themselves in an unknown situation should apply and use more general strategies. Marcel Veenman has extensively studied relation between intelligence and metacognition, he claims that it is possible to teach metacognition from primary school to university and certain conditions promote metacognitive skill acquisition. Metacognition should be embedded in the curriculum, explaining to the pupils the aim of metacognition and metacognitive skill learning should be extended over longer period of time (Van der Stel & Veenman, 2014).

Metacognition allows people to solve novel problems in new contexts and every subject can benefit from metacognition teaching. Schools are trying to use innovative solutions, in order to maximize student progress. There is also a need for greater focus on research and development of tools to measure metacognition, primarily for the screening purpose. Metacognition promotion has specially big positive effect for disadvantageous students' learning outcomes (Perry et. al., 2019).

There are Several categorizations of metacognition. One of the problem in research literature is that different constructs are inconsistent and lack coherence (Zohar & Barzilai, 2013). One of the greatest debates revolves over the question whether metacognition is domain general or domain

specific. Studies reveal, that it is both domain specific and domain general. It depends highly on the context, especially on the age of the students. Recent studies state that metacognitive skills have a tendency to generalize over time (Zohar & Barzilai, 2013). According to the authors' systematic review, there is a tendency of growing of research studies in metacognition, especially in more specific domain circumstances, and even in finer grain structure, for example Newtons mechanics (Zohar & Barzilai, 2013).

First signals showed that young children are quite unaware of their cognition phenomena or metacognition. They do relatively little memory, comprehension and other processes monitoring (Flavell, 1979). According to Flavell, monitoring of cognitive processes occurs as four cognitive phenomena: metacognitive knowledge, metacognitive experience, goals or tasks and metacognitive strategies (Flavell, 1979). In real life situations, metacognition is rather concerned with the extent to how much you should believe in an idea or do what it says, and not how well you understand it.

One of the concerning questions is that studies in metacognition predominately are conducted among older students. The evolution of professional development of in and pre service teachers in the field of metacognitive knowledge about instruction is still under research (Zohar & Barzilai, 2013).

Aim of the Study

The aim of this study was to develop a new metacognitive awareness inventory for 10-12 grade pupils for screening purposes. For this reason, two data analysis were conducted, with the following research questions:
1) does the structure of a new inventory meet psychometric criteria and forms of metacognitive component i.e. factors of regulation of cognition?
2) does the determined factors of metacognition are confirmed by empirical data?

Materials and Methods

Participants

A total of 1,524 pupils (49.6% boys, 50.4% girls) aged 15 to 16 years, M = 15.30 (SD = 0.54) participated in the study and completed Metacognitive Awareness Inventory. After clearing data of incomplete inventories, data of 1257 pupils (48.4% boys, 51.6% girls) aged 15 to 16 years, M = 15.30, (SD = 0.53) was used in analysis (14-year-olds were 69.38 %, and 15-year-olds 30.62 %). Students from 60 schools in Latvia participated in the study. On average, pupils from each school were

M = 20.6, SD = 14.77 (median = 16). Average time for completing the inventory was M = 5.60 minutes (SD = 5.41, median = 5). Differences between gender samples were only in three items however the differences were minor (Cohen's d 0.23 [95% CI: 0.12, 0.34], so further data analysis was done across the whole sample.

Instruments

35 items were developed based on the idea of original 52-items Metacognitive Awareness Inventory (Schraw & Dennison, 1994 by permission of auth. Dennison) with an aim to create short instrument of MA evaluation. New items were created and made specific to the content of national level large scale-assessment in Science, according to the new curriculum. Items were arranged in 5 subcomponents of regulation of cognition as in the original inventory: 1) planning — planning, goal setting, and allocating resources prior to learning (f.e. "I read instructions carefully before I begin a task"); 2) monitoring – assessment of one's learning or strategy use (f.e. "I find myself analysing the usefulness of strategies while I study"); 3) evaluation – analysis of performance and strategy effectiveness after a learning episode (f.e. "I ask myself if I have considered all options after I solve a problem"; 4) information management – skills and strategy sequences used online to process information more efficiently (e.g. organizing, elaborating, summarizing, selective focusing)(f.e. "I slow down when I encounter important information"); 5) debugging – strategies used to correct comprehension and performance errors (f.e. "I stop and reread when I get confused"). The survey response scale was in 6-point Likert scale from "never" to "always".

Procedure

The survey was given to pupils right after they had completed the test in natural science during second semester of 2019. Survey was filled online immediately after the test. Inventory items were divided into 3 blocks and before each block, there a were specific instructions given about before, during and after tasks (Maitland et al., 2015). For example: "Now, there will be a number of statements about what you thought you were thinking about before you started to perform tasks", thus extending it to the planning phase. Inventories were completed in large groups, classroom setting right after completing the test. Students used the instrument's standard response format – rating each item using a 5-point Likert-type scale: 1 (never), 2 (seldom), 3 (sometimes), 4 (often), and 5 (always). The instrument took less than 30 minutes to complete. The few students who chose not to participate in completing the instruments were given a book to read.

Data analysis

In order to answer the questions of the research, the indices of total item correlations or discrimination and reaction or difficulty were analyzed, as well the internal consistency. Subsequently, a factor analysis (EFA) was performed. Finally, the structure of the obtained factors was tested by confirmatory factor analysis (CFA). JASP data processing software was used.

Results

To answer the first research question, initial descriptive analysis of items were calculated (Table 1) to test item reaction and discrimination indices. Reaction indexes were M = .59 SD = .22 (.33 – .80) (recommended >.6), corrected item total correlation .15 – .62 (recommended .30-.70). All items were decided to be appropriate for inclusion in the EFA. Internal consistency was calculated by Cronbach's criterion and for all scale α was .92. Before the factor analysis, appropriateness of the data for the factor analysis was analysed via Kaiser-Meyer-Olkin (KMO) and Barlett Sphericity test. KMO value of the scale was .92 which means that data are appropriate for the factor analysis (Barrett & Morgan, 2005). Bartlett's test of sphericity, which shows multivariate normality, was significant ($\chi^2(595) = 13508$, p<.001). Factorial analysis with varimax rotation was conducted. Factors were initially retained based on consideration of the eigenvalues and the amount of variance explained. After removing the unfit items, the structure of the factors improved, leaving the clearer structure of three components. Items relevant to information management and debugging strategies were inappropriate. However, data analysis showed that a three-factor model was appropriate. A three-factor solution (with eigenvalues over 1.0) explained 43.98% of the variance. The first factor explained 28.09% of the variance, the second factor explained an additional 9.47% of the variance and the third factor 6.42% of the variance as well.

In order to answer the second research question, confirmatory factorial analysis was conducted. With CFA it is possible to explore how the measurement model which operationalizes the theoretical factor structure fits a set of empirical data (Harrison & Vallin, 2018). To evaluate the fit of the models, criteria recommended in Hu & Bentler (1999) was used where adequate models typically exceed .90 on the global comparative fit index (CFI) and the Tucker-Lewis index (TLI) and well-fitting models have CFI and TLI estimates greater than .95 with the root mean square error of approximation (RMSEA) less than .06. To compare the models, maximum likelihood estimation was used. Factorial analysis was based on three-component model: planning, monitoring, and evaluation. To identify the best set of items, CFA was made in multiple iterations.

Table 1. Descriptive statistics of MAI version

	Mean	SD	Diffi-culty	Discrim-ination	Skew-ness	SE	Kurtosis	SE
Item 1	4.12	1.39	.69	.44	-0.241	0.069	-0.755	0.138
Item 2	3.86	1.295	.64	.53	-0.147	0.069	-0.539	0.138
Item 3	3.3	1.281	.55	.52	0.262	0.069	-0.47	0.138
Item 4	4.66	1.277	.78	.45	-0.667	0.069	-0.327	0.138
Item 5	3.37	1.363	.56	.50	0.205	0.069	-0.677	0.138
Item 6	4.81	1.209	.80	.39	-0.715	0.069	-0.441	0.138
Item 7	1.99	1.164	.33	.36	1.254	0.069	1.299	0.138
Item 8	4.8	1.149	.80	.17	-1.118	0.069	1.115	0.138
Item 9	2.42	1.298	.40	.39	0.774	0.069	0.036	0.138
Item 10	3.73	1.403	.62	.43	-0.094	0.069	-0.746	0.138
Item 11	3.69	1.432	.62	.42	-0.202	0.069	-0.685	0.138
Item 12	3.11	1.247	.52	.60	0.352	0.069	-0.299	0.138
Item 13	3.98	1.353	.66	.50	-0.187	0.069	-0.788	0.138
Item 14	3.47	1.298	.58	.62	0.076	0.069	-0.613	0.138
Item 15	3.75	1.333	.63	.55	-0.008	0.069	-0.779	0.138
Item 16	2.7	1.364	.45	.38	0.545	0.069	-0.417	0.138
Item 17	3.95	1.365	.66	.17	-0.534	0.069	-0.477	0.138
Item 18	4.47	1.312	.75	.47	-0.475	0.069	-0.674	0.138
Item 19	3.52	1.273	.59	.56	0.099	0.069	-0.592	0.138
Item 20	3.45	1.476	.58	.52	0.141	0.069	-0.896	0.138
Item 21	3.78	1.216	.63	.57	0.009	0.069	-0.483	0.138
Item 22	3.39	1.263	.57	.25	0.105	0.069	-0.56	0.138
Item 23	3.6	1.209	.60	.53	0.163	0.069	-0.465	0.138
Item 24	3.57	1.303	.60	.45	0.068	0.069	-0.553	0.138
Item 25	3.72	1.269	.62	.46	0.012	0.069	-0.601	0.138
Item 26	2.86	1.4	.48	.33	0.391	0.069	-0.693	0.138
Item 27	3.55	1.308	.59	.44	0.018	0.069	-0.555	0.138
Item 28	3.3	1.283	.55	.52	0.113	0.069	-0.473	0.138
Item 29	2.91	1.298	.49	.40	0.474	0.069	-0.191	0.138
Item 30	3.06	1.317	.51	.43	0.247	0.069	-0.51	0.138
Item 31	3.94	1.379	.66	.15	-0.476	0.069	-0.53	0.138
Item 32	3.07	1.327	.51	.46	0.299	0.069	-0.49	0.138
Item 33	3.12	1.387	.52	.48	0.233	0.069	-0.638	0.138
Item 34	3.01	1.271	.50	.53	0.293	0.069	-0.441	0.138
Item 35	3.53	1.376	.59	.51	0.043	0.069	-0.633	0.138

SE – standard error

As Table 2 shows, the first 5 models indicate that none met the criteria for adequate fit. The factorial model with each subsequent iteration was improved after several iterations of item elimination. At the 6th iteration after 23 items had been eliminated, best criteria was met. The model functioned adequately (based on the criteria that adequate models have CFI and TLI > .95). In this 9-item model, the global fit indices indicated good

model fit (CFI = .966, TLI = .949, RMSE = .059 [95% CI: .049-.069]), and the chi-square test was still significant ($\chi2$ = 131, df = 24, p < .001). Final iteration resulted in 9 items (Appendix 1) that had good fit in CFA models and clear structure of 3 components: planning, monitoring, and evaluation.

Table 2. Iterative models of CFA of Short Metacognitive Awareness Scale items

Iteration	N of items	CFI	TLI	SRMR	RMSEA	RMSEA 90% CI	
						Lower	Upper
1	32 items	.807	.784	.057	.065	.063	.067
2	30 items	.841	.820	.053	.061	.059	.064
3	21 items	.888	.864	.044	.063	.059	.067
4	14 items	.916	.885	.043	.068	.063	.074
5	11 items	.936	.908	.038	.068	.060	.076
6	9 items	.966	.949	.026	.059	.049	.069

Conclusions

There is a lack of credible empirical data for the more than three factor model of metacognition and instruments tend to be more inaccurate than the fine-grained theoretical descriptions (Pintrich et al., 2000). Overall evaluation of the Short Metacognition Awareness Scale (SMAS) which captures only one component of metacognition shows that it has three main components of regulation of cognition (Table 3). The Components include planning, monitoring and evaluation factors. Items relevant to information management and debugging strategies were unappropriated and excluded from the inventory. This structure is similar to the two-component structure suggested by other researches of regulation of cognition (Brown, 1987; Flavell, 1987; Jacobs & Paris, 1987). Confirmatory factorial analysis revealed that 9-item model had good fit and good structure of 3 components: planning, monitoring, and evaluation. Our provisional conclusion is that this 9-item subset will function equally well in sample of 10—12 graders. According to the initial development results SMAS instrument is convenient for the teachers' use in classroom for screening purposes without overburden for the students and without time consumption. Authors argue that metacognition regulation should be assessed during the teaching and learning process to develop better teacher practices and student awareness of metacognition regulation.

Further research is necessary to develop and validate instruments in different grades in order to establish convergent and discriminant validity for use in school for the whole K-12 education. The next steps will

determine the relevance of the instrument to specific aspects of science subjects as well in other learning areas.

As with all research studies, this study has limitations. The sample is more homogeneous in terms of students, because it is based on schools which participate in new curriculum development, which brings school focus on the 21st century skills. But at the time of starting the research, the school curriculum did not include teaching metacognitive skills, and thus one can assume that the ability to reflect on their own cognition was not developed explicitly. in the further research, it is very important to find out which metacognitive components predict better student achievement in different subjects.

Table 3. Short Metacognitive Awareness Scale statements

Component	Statement
Planning	I consider problem solving strategy before I begin a task
Planning	I consider several alternatives to a problem before I begin a task.
Planning	I think of several ways to solve a problem and choose the best one.
Monitoring	I ask myself if I have considered all options when solving a problem.
Monitoring	I ask myself questions about how well the problem-solving strategy is during the task.
Monitoring	I find myself pausing regularly to check my comprehension.
Evaluation	I ask myself how well I accomplish my goals once I'm finished
Evaluation	I ask myself if I have considered all options after I solve a problem.
Evaluation	I ask myself if I completed as much as I could have once I finish a paper.

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ENHANCING STUDENTS' METACOGNITION IN THE CLASSROOM

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ABSTRACT

Metacognition and its effects on learning have been studied for more than 40 years. However, until now there has not been a requirement for teachers in Latvia to develop students' metacognitive skills. With the new competence-based curriculum from 1st September 2020, it will become mandatory. Three essential regulation skills that student's need to develop are planning, monitoring and evaluating.

To understand better teachers' current practice and readiness to implement new curriculum, a case study was carried out. The aim of the case study was to collect data about elements of metacognition in teachers' current practice. To achieve this aim, 20 consecutive lessons were observed in a large school in Riga. Lessons were taught by 10 different teachers, but to the same students (10th grade). During the lessons, observations of students and teachers' actions that potentially are connected to the metacognition were recorded and briefly described. Afterwards field notes were classified and analysed according to the categories – planning, monitoring, evaluating. In conclusion, practical ideas to promote students' metacognition are summarised.

Keywords: metacognition, teachers' practice, planning, monitoring, evaluating.

Introduction & background

In the literature, metacognition was first described in the late seventies of 20th century by Flavell (1979) as one's knowledge of one's own cognitive processes and anything related to these. In another words, cognitive knowledge and skills are necessary to perform a task, while metacognition is necessary to understand how the task was performed (Garner, 1987, as cited in Schraw, 1998).

Researchers describe two aspects of metacognition – knowledge of cognition and regulation of cognition (Schraw, 1998). This means that metacognition involves not only the knowledge and awareness of cognition but also the ability to control it (Swartz & Perkins, 1989). In the school context, components of metacognition are awareness of processes that influence learning and the successful completion of the task, ability to

determine if a task is being completed correctly, capability to monitor progress, adapt and make appropriate changes in learning strategies if necessary (Baker & Brown, 1984).

Metacognitive knowledge includes declarative knowledge (the students' knowledge of his or herself as a learner, the knowledge about academic tasks), procedural knowledge (the knowledge about learning and learning strategies that can be employed to fulfil the assigned task) and conditional knowledge (knowing when, how and why to use declarative and procedural knowledge) (Baker & Brown, 1984; Schraw, 1998).

Cognitive regulation skills that students need to advance to become metacognitive and independent learners include self-awareness, self-responsibility, self-reflection, goal setting, time management, planning and selecting appropriate learning strategies, monitoring progress of learning, analysing the effectiveness of learning strategies, correcting errors and changing learning behaviours and strategies when necessary (Ridley et.al., 1992; Winn & Snyder, 1996).

In the next few years, the gradual transition to competence-based education will take place in schools of Latvia. Previous amendments to the basic education standard were made in 2014. The new basic education standard comes into force on September 1st, 2019. One of the major changes in the new standard is that in addition to subject specific knowledge, skills and competences content has been complemented by transversal skills and value-based habits (*Regulations Regarding the State Standard in Basic Education*, LV, 2018). Metacognitive skills are incorporated under one of six transversal skills related to self-regulated learning. Despite the fact there are common core between self-regulated learning and metacognition, they cannot be viewed as synonyms. Self-regulated learning incorporates aspects of both metacognition and self-regulation (Dinsmore, Alexander & Loughlin, 2008). The focus of this article is metacognitive part of self-regulated learning.

Among the new basic education requirements, metacognitive learning outcomes are:

- Students set short-term and long-term goals, plan steps to achieve the goal,
- Students use the strengths of their thinking and strategies of thinking that are appropriate to the situation to develop their abilities and improve their performance,
- Students independently develop criteria, which indicate the achievement of the goal, learn about their progress and determine whether and how to improve performance.
- Students use mistakes to purposefully change their actions. In the course of learning, students re-plan a few steps to get a better solution.

The implementation of the new standard in schools will begin as of September 1, 2020 for grades 1, 4 and 7, on September 1, 2021 for grades 2, 5 and 8, and September 1, 2022 for grades 3, 6 and 9. To implement metacognition in practice, teachers will need support. In the next sections of the article, the general principles that characterize classroom practice promoting metacognition are outlined and case study results (that was carried out in a school that represents a typical large school in Riga) are analyzed to better understand teachers' current practice. In conclusion, the findings about the students and teacher actions that enhance students' metacognitive skills are summarised.

Metacognition in classroom

There are many evidences provided by researchers as to why metacognition is important in learning process and why teachers should focus their attention on the development of students' metacognitive skills. For example, Alexander and colleagues (1988) suggest that teaching metacognitive strategies improves students' academic achievements, by improving students' cognitive processing and learning (Azevedo, et al. 2007). Teaching metacognitive strategies also increases students' self-awareness about what it takes to learn (Kolencik & Hillwig, 2011). In fact, in some situations metacognitive knowledge and cognitive regulation skills can compensate for the lack of cognitive knowledge and skills (Schraw, 1998).

Costa (1984) points out that in the learning process students tend to follow instructions and rarely think about learning strategies and efficiency of their learning, if they are not encouraged by the teacher. To develop students' metacognitive skills and the habit to use those skills it is necessary to include in lessons activities/ tasks/, methods that compel students to think about their thinking and learning process. However, this should not be seen as some additional activities and tasks for teachers to do, but rather as effective pedagogy that is incorporated in their everyday classroom practice (Quigley, et al., 2018).

There are various strategies to enhance metacognition for teachers to choose. In previous research that aims to identify instructional approaches that promote metacognition, three categories of instructional strategies have been identified — planning, monitoring and evaluating thinking (Ellis, et al. , 2014).

Planning includes goal setting, selection of appropriate learning strategies, estimation of time and resources needed to fulfil the task. Monitoring includes following the fulfilment of the task, ability to engage in periodic self-testing, changing learning strategy if necessary. Evaluating

includes assessing not only the learning outcome but also the learning process (Quigley, 2016; Schraw, 1998).

In Table 1, questions of self-reflection regarding planning, monitoring and evaluating are summarised. Questions can be used to help students successfully plan, monitor and evaluate the task and their efforts (Quigley, 2016).

Table 1. Questions of self-reflection

Planning	What prior knowledge do I need to tackle the task? What type of planning process should I use? What is the most appropriate strategy to fulfil the task? What examples can I use to guide me? How much time do I have? What resources do I need? Where should I start?
Monitoring	Am I on the right track? Have I made any mistakes? What I need to pay attention based on previous feedback? Do I have any typical failings that I should be aware of? Do I need to change approach/ technique? What do I do if I am stuck? What do I need to do next?
Evaluating	How well did I do? Did I match the success criteria / complete checklist? Is there anything that I missed? Do I need to go back and fix errors/ make additions? Is this the best possible version that I can do? Did I choose the right approach/ strategy/ technique? What alternative approaches/ strategies/ techniques would I like to try? How can I do better next time?

The *Plan, monitor, evaluate* cycle can be done over shorter or longer learning activities – it may be one task, one lesson or the whole day. While there are some benefits to introducing students to the planning, monitoring, and evaluating in general, and many of the strategies can be used in different subjects, the evidence suggests that they are best taught through subject content (Quigley, et al, 2018).

Studies also show that direct instructions in metacognition may not be effective. Instead, for metacognition to improve, students have to experience the need for those strategies (Costa, 1984), and that happens when students are challenged. If students undertake a challenging task, they have to develop new skills/ strategies to fulfil it, they have to plan how to overcome challenges and afterwards they have something to reflect on. However, challenges need to be set at an appropriate level, or the learners may not accept the challenge or they can be subjected to cognitive overload (Quigley, et al., 2018). That means that teachers need

to be careful about when and how to place metacognitive tasks so as not to distract students when they are learning cognitive content because there is a risk that students will not be able to develop new cognitive and new metacognitive skills at the same time (Quigley, et al., 2018).

Methodology

This article deals with part of the ethnographic research, which aims to develop a support system that would help teachers in Latvia to implement metacognition into their practices. To understand teachers' current practice better, a case study was carried out. The aim of the study was to collect data about the elements of metacognition already present in lessons before the implementation of the new curriculum. To achieve this aim, 20 consecutive lessons taught by different teachers, but to same students (10th Form), were observed in a large school (1300 students, 100 teachers) in Riga. The school and the class were chosen randomly. Teachers, students and parents were informed about the study. They were informed that the aim of the study is to better understand the current learning process at the school, but it wasn't revealed that the researcher is particularly interested in metacognition. Participants agreed that data from lesson observation will be analysed. The participants were informed that the name of the school and the names of the teachers and pupils will stay anonymous.

When interpreting the results of this study one needs to remember that it represents situation in a particular school, but as the school chosen for research represents a typical large school in Riga (regarding qualification of teachers, teachers' professional development activities in school, students' results in state examinations and students' background), with caution the conclusions may be extended to other schools.

All lessons the particular students had during the period of three days were observed. The number of lessons was chosen to cover different classes (Latvian, literature, English, German, Russian, history, mathematics, physics, biology, geography, economics) and 10 different teachers. During lesson observations, students and teachers' actions that potentially are connected to the metacognition were recorded and briefly described (teachers' role, students' role, and activities). Afterwards, 19 pages of recorded field notes were classified according to the categories offered in the literature – planning, monitoring, evaluating. Only those activities and actions that were purposefully included in the course of the lesson (where the task given by the teacher required students' metacognitive thinking) were used in the analysis. For example, *"the teacher asks students to discuss, compare and evaluate their solution of the problem"* is a metacognitive activity that is purposely included in the lesson by the teacher, but *"during the time that*

teacher is intended for students to work independently on the problem, one student quietly asked his peers to compare results" is not an action that is fostered by the teacher although the student displayed metacognitive monitoring.

Results and discussion

Planning

The first step to students' awareness of learning and metacognition is clear learning objectives. Communication of learning objectives was observed in 15 lessons out of 20. Learning objective should state what students would be able to do at the end of the lesson or learning segment. Lesson observation indicates that teachers tend to formulate learning objectives as the theme of lesson, e.g.*, "Today we will learn about gravitation and motion in gravitational field"* or state what students will do in the lesson, e.g., *"We will prepare for the test".* Another example seen in lessons is to formulate learning objectives as a question, e.g., *"Why Charles the Great is important and unique in European history?"* A simple way to influence metacognition is to change the way teachers are formulating learning objectives. Verbs like *analyse, compare, evaluate, categorise, organise, debate* suggests higher level thinking and triggers metacognition by stimulating students to think about what they had to do in the past when they previously had to *analyse/ compare/ evaluate* etc. (Kolencik & Hillwig, 2011). In the example about Charles the Great, the improved learning objective would be *analyse the influence of Charles the Great on the economic, political and cultural development of Europe.*

Only in one lesson (out of 20), the teacher talked not only about learning objectives for specific lesson, but also about the long term learning goals and how the lesson leads to them.

Of concern in this respect, is that students were never involved in the formulation of learning objectives or discussion about them. One of the metacognitive skills students need to develop is setting learning objectives for themselves.

In all of the observed lessons, previously learned knowledge and skills were activated. Activating prior knowledge itself is a metacognitive activity. In almost all cases, teachers used the same method – frontal questions and answers, e.g., *"What do you remember from the last lesson?", "What do you know about …?" "Based on… what we will learn today?"* etc. While these are good questions, which stimulate metacognition, rarely more than a few students were actively participated in these question and answer sessions. This can be easily improved by using the *think – pair – share* technique that was observed in one of the lessons. That would give students a chance to think independently at first, and for all students to be active participants.

Another approach observed in lessons to activate previously learned knowledge was the use of picture as a way to create initial interest in the content to be studied, and test questions and puzzles as formative assessment of previously learned content. The literature suggests many other ways to activate prior knowledge, e.g., a commonly used organiser is the K-W-L chart *(What do I already know? What do I want to learn? What have I learned?)* (Kolencik & Hillwig, 2011). Teachers should be encouraged to be more diverse in methods, techniques and the learning strategies they use in classroom.

Another of the metacognitive skills students should master is the ability to estimate time and resources needed to fulfil the task. Only one of the observed teachers asked students to estimate how much time they will need for a specific task. In two other cases teachers set time limits for activities. However, in all the rest of the observed lessons there were not set any time limits for students and, in combination with vague learning objectives, this discourages students to take responsibility for their time management.

Monitoring

Regarding monitoring, there were occasions when the teacher stopped students in the middle of the process of problem-solving to discuss their progress. In 10 cases, it happened in response to students' questions, for example, in the lesson of mathematics the question about how to draw specific graphs triggered class discussion. Similar examples were observed, e.g., in the lessons of geography and Latvian. Monitoring was also observed in the situations when students needed to complete tasks with several similar examples (13 cases), e.g., in Latvian students needed to create adverbs from given words. After students tried some examples on their own, the teacher stopped them, compared and discussed what students had written. Then students continued to work on their own.

Another way how monitoring was present in the classroom was in the form of individual feedback from teachers. In some cases, the feedback was given publicly during class discussion (observed in 5 lessons). For example, in the English lesson after each student had presented his/ her arguments, the teacher asked questions, such as *"What do you mean with …?", "Why …?", "How do you define…?"* etc. Similar examples were also observed in lessons of German, history and literature.

The observation showed that a typical way for the teacher to give feedback (observed in 15 lesson) was while students individually worked on the task, the teacher walked through class and gave an individual feedback to students. Mostly this feedback was about cognitive content. However, in some cases there were also metacognitive questions present, e.g., in

a history lesson the task for students was to display written information on the map. While giving individual feedback, the teacher asked questions like *"What was the task?", "Why did you mark this?", "What does this colour/ arrow represents?"* etc.

Evaluating

There were several ways observed in lessons that showed how the teacher encourages students to evaluate their work and learning. One way is to offer students the task of self-reflection at the end of the lesson (observed in 7 lessons). For example, at the end of the Latvian lesson students were asked to complete a short test to check their understanding about adverbs and write questions about what is still unclear for them. At the end of the history lesson students were asked to write three words that describes Charles the Great. At the end of the literature lesson, students were asked to vote about the learning that had happened in the lesson *("Did I learn something new?" "Did I actualise something I already knew?")*. At the end of the English lesson, the teacher had a discussion about the debates that students had during lesson, each student was asked, "*What do you think you need to improve?", "How did you feel?", "Are you satisfied with your response?"*

In one of the observed lessons, self-reflection was the first task students did. In the lesson of economics, students were asked to evaluate what they have already done regarding the idea about their student enterprise.

There were four lessons were teacher intended to offer self-reflective tasks at the end of the lesson, but due to lack of time, it was not properly executed. For example, there were eight lessons where students did not have the time and opportunity to self-reflect about the outcomes of the lesson.

Another way of evaluation observed in lessons was evaluation of particular task that students had worked on (observed in 18 lessons). For example, in the lesson of Latvian, after students had finished a task intended to actualise previous knowledge, teacher had a class discussion about questions like *"What part was the easiest? Why?", "What part was the hardest?", "How did you solve the task?"* Another example was observed in the German language lesson, where the teacher discussed with students the correct answers, asked students to explain their answers and referred to the diagrams that previously were introduced to better understand grammatical structures. Similar evaluation of task was also observed in other lessons, e.g., mathematics, geography, biology etc. In mathematics, the teacher discussed with students how a particular task would be evaluated in assessment.

Part of evaluation that was not fully utilised in the lessons is peer tutoring and peer evaluation. Although in some of the lessons there were elements of peer evaluation and tutoring recorded, structured example

of peer evaluation were observed only in one lesson. In the lesson of economics, students were asked to give specific feedback regarding peers' presentations, in the following lesson students worked with the feedback they had received.

Conclusions

Although the fact that elements of metacognition are present in lessons is encouraging, lesson observations showed that in most cases these activities happen through the teacher. The teacher is mainly the one who states what and how students will learn, what strategies students will use (e.g., what graphic organisers students will use while working with text).

For teachers to implement metacognition into their practice, examples of manageable actions that can be used as first steps in changing their practice and improving students' metacognition could be useful. Based on the data collected in the case study and suggestions from the literature, recommendations to promote students' metacognition are summarised in Tables 2, 3 and 4.

The first part of each table gives examples of teacher's actions that stimulate students' metacognition. For example, the teacher should verbalise the thinking process regarding the task. By doing so, the teacher shows students how expert thinks about the problem; how the expert approaches and monitors the progress and also, how the expert evaluates the results. When describing their thinking, the teacher should use specific cognitive terminology. By deliberately including metacognitive terms (predict, reflect, classify, hypothesise, justify etc.) teacher demonstrates metacognitive awareness that students should develop (Kolencik & Hillwig, 2011).

The second part of each table gives examples of students' actions that indicate that students actively think about their learning. Students should first have the opportunity to use the models frequently, but the goal is to start practising these behaviours on their own (Gray, 1991).

The last part of each table gives examples of useful classroom activities/tasks that teachers can use in their lessons.

Table 2, summarises students' and teacher's actions that enhance metacognitive planning skills. If the recommendations from Table 2 are compared to the case study results, the first step for teachers to improve their practice could be involving students in the formulation of learning objectives. This is also one of the learning outcomes of self-regulating learning in the new basic education standard. Another important aspect regarding planning is that students should be able to choose an appropriate learning strategy for the task. That means that students have to know the different learning strategies (e.g., different strategies of how to work

with text). In the observed lessons, there was only one occasion when the teacher deliberately taught learning strategy (during the history lesson, teacher demonstrated how to use the graphic organiser to construct a definition of the term). Researches, e.g., Kolencik and Hillwig (2011), indicate that teachers rarely teach learning strategies because they are convinced that students already know and are able to use them. If possible, students should create strategies on their own, discuss and evaluate them and practice them until they become a habit (Costa, 1984).

Table 2. Summary of students' and teacher's actions to enhance planning skills

Teacher's actions	Focus students' attention on learning objectives, short-term and long-term goals. Make certain that students understand learning objectives. Activate prior knowledge and skills that will be important during the lesson/ task. Verbalise your metacognitive thinking related to planning. Give an exact and clear instructions for cognitive/ metacognitive strategies that students will need to use (for example, how to use a specific graphic organiser), make sure students understand the key aspects and main purpose of those strategies. Set time limits for activities.
Students' actions	Set learning objectives for themselves Conclude what knowledge and skills that they already have are relevant to the task, and identify what they need to learn. Select appropriate strategies to fulfil the task successfully. Consider how to allocate their efforts, split responsibilities. Assess the time it will take to complete the activity. Make a list of resources that they will need, and where they can find them.
Examples of useful classroom activities	Together with students, generate a list of questions or things that they need to learn to solve the problem/ complete the task. Ask students to rewrite the problem in their own words, identify what they know and what they need to find out. Ask students in small groups or pairs, to come up with various ways to solve the problem/ complete the task. Use structured planning templates. Use metacognitive talk/ teacher and student "think aloud". Visualise planning by using graphic organisers, concept maps, flow charts etc. Purposefully teach different learning strategies, e.g., how to take notes from the textbook.

Table 3, summarises students' and teacher's actions that enhances metacognitive monitoring skills. If divided in the categories of planning, monitoring and evaluating, most of recorded actions and activities observed in lessons were regarding evaluation, with the least regarding monitoring. There are researches showing that monitoring ability develops slowly and is deficient in children and even adults (Schraw, 1998). That means that monitoring should be of particular interest for future research.

Lesson observations showed that all elements of monitoring observed in lessons were carried out through teachers' feedback. It can be changed by using peer tutoring or by using checklists and rubrics to enable students to monitor their progress individually.

Table 3. Summary of students' and teacher's actions to enhance monitoring skills

Teacher's actions	During the lesson, refocus students' attention to learning objectives. Break down the activity into simpler steps. Set guidelines/ steps to follow during activity. Verbalise your metacognitive thinking related to monitoring. Teach strategies how to organise and retain information. Use visual timers. Give non-judgemental feedback about students' decisions. Highlight successful examples and steps that led to success. Use, paraphrase, extend and build upon students' ideas. Ask clarifying questions about students' terminology and problem solving process. Label students' cognitive processes, e.g., "What you are doing is called an experiment".
Students' actions	Share their progress, describe their thinking, what they plan to do next and why. Use guidelines/ checklists (teacher given or self-made) to monitor their progress Examine their errors to identify where and why they went wrong.
Examples of useful classroom activities	Use metacognitive talk/ teacher and student "think aloud". Offer completed or half-done examples, ask to analyse them, then discuss conclusions. Provide students with answer sheets after they have tried to solve the problem. Ask students to find, correct and explain their mistakes. Add metacognitive questionnaire for students to complete during learning activity/ assignment. Ask students to write down questions/ important concepts during activity. Invite students to use visual organisers – mind maps etc., to show and monitor their thinking Use role play and simulations. Ask students to solve problems in pairs or small groups, during activity partners should take turns acting as solver and listener. Purposefully teach different learning strategies, e.g., triplicate note making. Encourage students to give and receive feedback from peers through gallery critique.

Table 4, summarizes students' and teacher's actions that enhances metacognitive evaluation skills. Lesson observations showed that in many cases self-reflective tasks at the end of activity or lesson were only about learning outcomes. To develop evaluation skills teachers and students

should focus more on the process of learning than the results of learning. Creating together with students, check-lists or rubrics, is an effective way to involve students in thinking about the quality of the work.

Table 4. Summary of student and teacher actions to enhance metacognitive evaluation skills

Teacher's actions	Verbalise your metacognitive thinking related to evaluation. Before learning activity, discuss with students how they will know that they have completed the task successfully. Before assignment provide or create together with students checklists, rating scales or rubrics. Give feedback according to previously set checklists/ rubrics. Help students to recognise what they did well and take credit for it. Encourage students to seek feedback from their peers.
Students' actions	Evaluate their work and actions according to criteria, use criteria to justify their reasoning, Recognise what they did well, and take credit for it. Seek feedback from the teacher and peers.
Examples of useful classroom activities	Use metacognitive questionnaire during an exam/ exam wrappers. Ask students to review and analyse individual assessment results together with metacognitive questionnaire. Ask students to evaluate and compare multiple examples, with subtle differences. Use metacognitive talk/ teacher and student "think aloud". Encourage peer tutoring (with clear parameters of time, roles and steps). Use different methods to give feedback, e.g., "Live feedback". Offer students opportunities for self-testing and answer checking Provide students with different methods of self-reflection, e.g., "Learning journals", "The Week in Review", "Muddiest Point" etc.

The case study shows that critical aspect of teachers' current practice is the fact that mostly planning, monitoring and evaluating is happening through the teacher. To enhance students' metacognition effectively, teachers should refocus those activities from themselves to students giving students a chance to be more proactive participants in the planning, monitoring and in the evaluating of their learning. This brings questions for future research: what are the factors that prevent teachers from transferring more responsibility to students? How it is connected with teachers' own notion, believes and experience regarding metacognition and self-regulated learning?

100 schools in Latvia now are in the process of piloting new national curriculum, in those schools situation could be different. Research on the experience of piloting schools would be necessary to understand better

the challenges to implement metacognition and self-regulated learning in the classroom.

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CHARACTER GROWTH MINDSET ENHANCEMENT IN EXTRACURRICULAR ACTIVITIES: AN INTERNATIONAL STUDY

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ABSTRACT

This paper is based on a virtue education intervention implemented by faith-based NGOs from Latvia, Estonia, Finland and Sweden in July 2018, which focused on participants' (N = 43) character growth mindset, i.e., the believe that everyone, including oneself, can become a better person. The research question was: What impact does participation in a one-week after school summer camp have on the development of 10–15-year-old participants' character growth mindset? The research adopted quasi-experimental approach using pre-test and post-test questionnaires and interviews. The intervention was found to have a positive impact on participants' character growth mindset, in particular regarding their perceived knowledge about how to become better persons and their belief that everybody can become a better person. Such extracurricular programs have the potential of enhancing children's disposition and 'know-how' to grow in virtue.

Keywords: Character growth mindset; Extracurricular activities; Moral education; Relational-self-of-virtue; Virtue growth.

Introduction

Pre-adolescence is a key period in moral identity development (Hart, & Fegley, 1995), because "early experiences seem to play a pivotal role in the formation of an ideological framework that encompasses issues of morality, which are closely affiliated to the self" (Matsuba, & Walker, 2005, 294). Interventions in extra-curricular activities (Birdwell, & Wybron, 2014; Scott, Reynolds, & Cadywould, 2016), also called "co-curricular" (Arthur, Kristjánsson, Harrison, Sanderse, & Wright, 2017, 96), are closely linked to children's character building (Harrison, Morris, & Ryan, 2016, 133–134). Many parents seek to develop children talents and personality during afterschool activities, adopting the so called "concerted cultivation" parenting style (Lareau, 2003; Vincent, & Maxwell, 2016).

Several NGOs based on Christian values, which collaborate with parents in children education by organizing educational activities, are

willing to professionalize their voluntary work (Baumgart-Ochse, & Wolf, 2018; Boan, Aten, Greener, & Gailey, 2016). The idea of this project was to collaborate with an international network of faith-based NGOs during a summer camp which provided participants leisure activities and Christian values education. The aim of the collaboration was twofold: enhancing NGO professionalization, and piloting and testing the impact of an original intervention in the field of virtue education.

Constructive alignment theory (Biggs, 2011) was used for creating the collaboration program, because its adaptability to short interventions like this one, contrarily to other existing models (e.g., Brunner's *spiral curriculum* approach: see Wright, Morris, & Bawden, n.d., 7). Therefore, the intervention design was aligned with the definition of the educational goals and the choice of evaluation methods. The challenge was to define such a goal that would contribute to children's virtue development, and that could simultaneously be realistically addressed during an intervention whose results could be reached and measured in a short time (the length of a summer camp). After joint discussion, considering that "ultimately, the goal of character education, and all comprehensive and enlightened education, is for students to become better people" (Berkowitz, & Bustamante, 2013, 12), it was decided to focus on children's understanding of the possibility of "becoming better persons".

Theoretical background

Recently, the project "Character in Transition" showed that 10–12 years-old viewed the development of character and values as important to them (Arthur, Davison, See, & Knowles, 2009). The theoretical background of the intervention was the concept of relational-self-of-virtue (Fernández González, 2019): the personal deep disposition to virtue growth in communities of virtue. Four components interact in the formation of a relational-self-of-virtue: the cognitive and emotional shaping of an ideal relational-self-of-virtue (including beliefs about character growth), the commitment to relational virtue growth (conational component), involvement in virtue growth in communities of virtue (phronesis-guided behavioural component), and a socially situated virtue identity (emotional-evaluative component). Due to time constraints, the focus of the intervention/evaluation was on the cognitive-emotional component, concretely on: 1) character growth *mindset* (believing on the possibility of improving character, for oneself and for others); and 2) character growth *practical knowledge* (knowing what to improve and how to do it). It should be noted that this kind of practical knowledge differs from the virtue of phronesis, which, according to Aristotle, is a judgement of

the practical reason about what to do here and now. The cognitive aspects are particularly relevant in early moral development stages: "What is of greater importance is that children learn about the process of acquiring and developing virtue" (Harrison., Morris, & Ryan, 2016, 71).

The research question guiding the inquiry and the design of the intervention was: What impact does participation in a one-week after school summer camp have on the development of 10–15-year-old participants' character growth 'mindset' and character growth 'practical knowledge' (know-how)?

Description and implementation of the intervention

The cognitive content of the intervention drew from the concept of "the drive to aspire" (Annas, 2011), including a Christian perspective: God's help for developing virtue (Council, 1994, No. 2013). Considering that "to grow in understanding of how to act well" is also part of the "virtue practice" area (Jubilee Centre, n.d., 6), during the intervention, a "daily topic" was decided in order to help children to focus on developing it during the day. The formulation of the daily topic was based on interpersonal competence (Park, Tsukayama, Goodwin, Patrick, & Duckworth, 2017) and on civic virtues (Jubilee Centre, 2017) (e.g., interpersonal self-control, cheerfulness, service, gratefulness).

The intervention plan (including the definition of its goal and contents) was designed jointly by the researcher and the NGO staff before the summer camp, resulting in a combination of "researcher-derived" and "practitioner-derived" program (Urban, Hargraves, & Trochim, 2014). It combined "taught" and "caught" elements. The "taught" elements included learning activities aligned with the educational goal and the evaluation methods (Biggs, 2011): a lecture about the daily topic (15 minutes per day, by country groups); individual "character growth coaching" (5–7 minutes, at the beginning and the end of the camp); and a daily guided reflection time (5 minutes, by country groups), in which 3 questions regarding the daily topic were read aloud with silent intervals; a "*Character Growth Card*" for personal use, (adapted from Duckworth, Tsukayama, & Patrick, 2014)[1] containing 3–4 growth indicators for each daily topic; and the initial questionnaire, which familiarized children with the intervention topics. The "caught" elements were: leaders' and volunteers' modelling; posters illustrating the daily topic (renewed every morning); background

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[1] https://www.greatschoolspartnership.org/wp-content/uploads/2016/11/January2014CharacterGrowthCard.pdf

songs with related content during sports and games; and staff T-shirts with the camp slogan ("*Dare, Change, Grow!*"). As an example, on day 3 the topic was 'Joy and good atmosphere', the slogan: 'Good friends are happy friends!', the songs of the day were "Easy Love" (Sigala), "Waving flag" (WordCup-2018) and "Euro 2016"; and on day 4 the topic was 'spirit of service', the slogan was 'Helping others is growing twice!', and the songs of the day were "I'm here for you" (Kygo) and "Lay all on me" (The Rudimental).

The intervention plan was informed by evidence drawn from different scientific sources. The centrality of modelling in character education is widely accepted (e.g., Arthur *et al.,* 2017, 102–104; Berkowitz, & Bustamante, 2013, 13–14). The choice of short lectures and personal coaching was based on good results obtained in previous years and in recent research (Jubilee Centre, n.d., 10–11). "Time for personal reflection" (Arthur, & Harrison, 2014, 35) was included because "self-examination makes up an important component of 'virtue practice'" (Wright, Morris, & Bawden, n.d., 10). Using posters is a widely used technique to "make character education visible" (Arthur, & Harrison, 2014, 34), and background music addressed the emotional component of the intervention. The draft of the intervention plan was discussed with the organizers for "*viable validity*" (Chen, 2010), a bottom-up approach to validity considering "practitioners' views and experience regarding whether an intervention program is practical, affordable, suitable, evaluable, and helpful in the real-world" (p. 207).

Regarding the implementation of the intervention, it took place during the last week of July 2018 within a summer camp with 45 boys (10 to 15 y/o) from 4 countries (Latvia, Estonia, Finland and Sweden) at Malminharju (Heinola, Finland). The staff included 7 volunteers and 7 leaders from those countries. Leisure activities included sports, games, swimming and free time. The good weather helped to have a nice atmosphere. The material aspects were well managed, as it was the 5th edition of the camp.

Intervention materials (growth cards, posters, outlines of lectures, daily reflection questions and questionnaires) were prepared beforehand for sparing time during the camp. Great importance was given to the involvement of the staff, to reinforce their 'buy-in' into the project: before the camp, the staff translated intervention materials in their national language, developed the lecture outlines, chose the daily songs, and introduced changes in the schedule proposal. On the day of arrival, the researcher explained the staff again the intervention goals and means and provided support materials (explanation of "character growth mindset" concept and a list of "beliefs of growth mindset facilitator"). During the camp, leaders leaded the lectures, coaching, and reflection times, and volunteers took care of posters, music, and leisure activities climate.

Methodology

Research methods. A survey research design (Robson & McCartan, 2016, 243) was chosen for impact evaluation. Using mixed methods seemed the best way to answer the research question (Denscombe, 2014). The voices of children and volunteers, and the professional judgement of leaders were triangulated (Harrison, Arthur, & Burn., n.d., 17–18). Two different questionnaires for participants and leaders, and semi-structured interviews with volunteers were used. The research instruments were designed in alignment with the intervention activities and the educational goals (Biggs, 2011).

The research adopted a quasi-experimental approach without control group (Cohen, Manion, & Morrison, 2011), using pre-test for baseline identification and post-test for measuring the differences at the end line. The hypothesis was that the intervention will make a difference in children's character growth mindset and character growth practical knowledge.

Research instruments. The pre-test questionnaire had 24 items addressing children's mindset and practical knowledge about character growth. The questionnaire had two sections: 9 "belief questions" (in a 5-point scale), and 15 "positioning statements" (in a 7-point scale). The questions addressing children growth mindset were adapted from the "Character Growth Mindset Scale" (Dweck, 2000). The questions addressing their "know-what" and "know-how" were based on the interpersonal section of the standardized "Character Growth Card" (Duckworth, Tsukayama, & Patrick, 2014) and were related to the "daily topics" that were decided for each day. On the 3rd day, the researcher shared with each country leader the pre-test findings for his country, and they discussed concrete "actions on the findings" (Harrison, Arthur, & Burn, n.d., 67). Even if the "feedback loop" (p. 17) was very short (there were only 4 days left till the end of the camp), it helped to adapt the contents of the remaining coaching sessions and daily lectures.

The post-test was identical to the pre-test, with some exceptions: an ambiguous question was slightly reformulated (item A6); a final section asking participants to rate in a 7-point scale the appropriateness of intervention activities was added; and 6 items whose pre-test average level was very high were removed (so, only 18 items were compared).

The questionnaire for leaders included questions about the impact of the intervention on children's beliefs (7 items in 5-point scale, parallel to the first section of the post-test) and about the perceived effectiveness of intervention activities (7 items, 7-point scale, parallel to the final section of post-test). The interview schedule addressed volunteers' motivations,

preparation, understanding of the central idea of the camp, received support, perceived personal improvement and respondents' suggestions for the future.

Data collection and analysis. The researcher leaded the pre-test in the bus of the camp during the last part of the trip (Helsinki – Maminharju), and the post-test in the participants' lodgement right at the end of the camp, for avoiding external contamination of results. The average time for completing each questionnaire was 12–15 minutes. Leaders' questionnaires were collected 2 to 5 days after the camp by email. The data were analysed using SPSS 21. The data set reliability was high (Cronbach's Alpha = .939). The Shapiro-Wilk test of normality, appropriate for small sample size (n < 50), showed that data were non-normally distributed, so non-parametric tests were used in the analysis. Interviews with volunteers lasted 8–10 minutes each, and they were done the last day of the camp. They were audio-taped, transcriber and analysed using MS Word software.

Research limitations and ethical considerations

Limitations of the research. Reliance on participants self-report is a major limitation of the study (Duckworth, & Yeager, 2015). Triangulation of children's, volunteers' and leaders' voices, which intended enhance reliability, was still based on their subjective views. However, "given the nature of 'virtue', there is really only one person who can say with any confidence whether they feel they are growing as a person…– and that is the student alone" (Wright, Morris, & Bawden, n.d., 18). During interviews and in open questions, staff mentioned randomly observed children behaviours supporting their views, but these were not structured and reliable observations.

The reliability of impact evaluation based in pre-post-test is limited because both questionnaires were not exactly identical. Moreover, "the correlation may be spuriously affected by the candidate's memory of having taken the same test a short time ago" (Arthur, Waring, Coe, & Hedges, 2012, 50; Duckworth, & Yeager, 2015). However, after a week full of different activities, probably children did not remember exactly how they rated the questions initially.

Other limits were the absence of a control group, the lack of time perspective to know how persistent the acquired knowledge will be, and social desirability bias, particularly strong at those ages. Collecting pre-test data at the end of the trip was convenient, but children who travelled longer were probably tired. In addition, the proximity of the end may have affected children concentration during the post-test. The "purity of the intervention" (Duckworth, & Yeager, 2015) was quite high, because of the absence of external social interaction, excepting participants' phone call to their parents. However, conversations among children and other

possible internal factors might have had an influence on children answers. In reasons of these limits, and of the reduced sample, the research findings are not generalizable.

Ethical considerations. Country leaders sent parents/guardians the research summary, requesting their consent for children participation. Children informed consent was also requested, and only those who wanted freely participated. Two children decided not to participate. For confidentiality reasons, analysis was done at group level, not individual level. For matching pre-test and post-test, each questionnaire had a confidential participant code known only by the researcher. Interview transcripts contained participants' pseudonyms. A summary of the findings was sent to the leaders for further action improving the next editions of the camp and for enhancing staff's professional development (Harrison, Arthur, & Burn., n.d., 18).

Findings

43 children participated in the research. Half of them were from Estonia (N = 23, 53.5%), and the rest were quite equally distributed between Latvia, Finland and Sweden. Children were between 10 and 15.5 y/o (Mean = 12,8). We present below the results for the sections "belief questions" and "positioning statements" of children questionnaires, commenting the findings on the light of the leaders' and volunteers' views. Regarding changes in children's beliefs in the section "questions", see in Figure 1 the pre- and post-test results (in a 5-point scale).
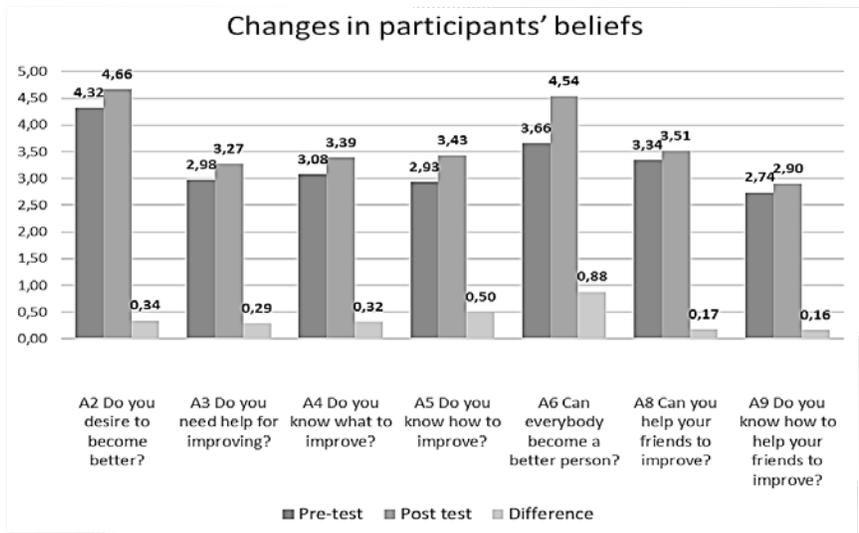
Figure 1. Character growth mindset "beliefs": Pre-test, post-test, Mean differences

In both the pre-test and post-test, the questions A2 ("Do you think that you have the desire of becoming a better person?") and A6 ("Do you think that everybody can become a better person?") were rated the highest, but the lowest rated was A9 ("Do you know how to help your friends to become better persons?"). Comparing pre-test and post-test, the mean for each question was slightly higher after intervention. The lowest increment was in questions A9 (Mean increase: +0.16 in 5-point scale) and A8 ("Do you think that you can help your friends to improve as persons?": +0,17), both related to helping others. The biggest increment was in questions A6 (+0.88, maybe due to its reformulation in the post-test) and A5 ("Do you know how to improve your personality?": +0.50). The relatively low increments observed in all criteria could be due to chance. For testing their statistical significance, the nonparametric Wilcoxon (paired) signed-rank test was the most appropriate (Cohen, Manion, & Morrison, 2011), because it was possible to match each student's pre-test and post-test scores. Statistically significant differences were found only in criteria A5 (p = .008) and A6 (p = .002).

Triangulating the changes found on children's beliefs (see Figure 1, column "Difference") with leaders' opinions about the impact of the intervention on children beliefs (see Table 1), it was found that, for both of them, the highest impact (change) was on criterium A6, and the lowest one – on criteria A8 and A9. There was no coincidence of data about criteria A5 (for children it was the 2nd biggest change, but for leaders it came in 4th–5th place).

Table 1. Intervention impact on participants' growth mindset change: Leaders' opinions

¿Do you think that the intervention helped the children...	Mean (5-point scale)	S.D.
A2 ...to increase their desire of becoming a better person?	4.0	.58
A3 ...to understand better that they need help for improving themselves?	3.9	.69
A4 ...to know better what they should improve to become a better person?	4.0	.82
A5 ...to know more concretely how to improve their personality?	3.9	.69
A6 ...to understand better that everybody can become a better person?	4.4	.53
A8 ...to understand better that they can help their friends to improve as persons?	3.4	.79
A9 ...to know more concretely how to help their friends to become better persons?	3.0	.82

Regarding changes in children (dis-)agreement with the given statements about how to become a better person, see in Figure 2 the comparison of pre-test and post-test results.
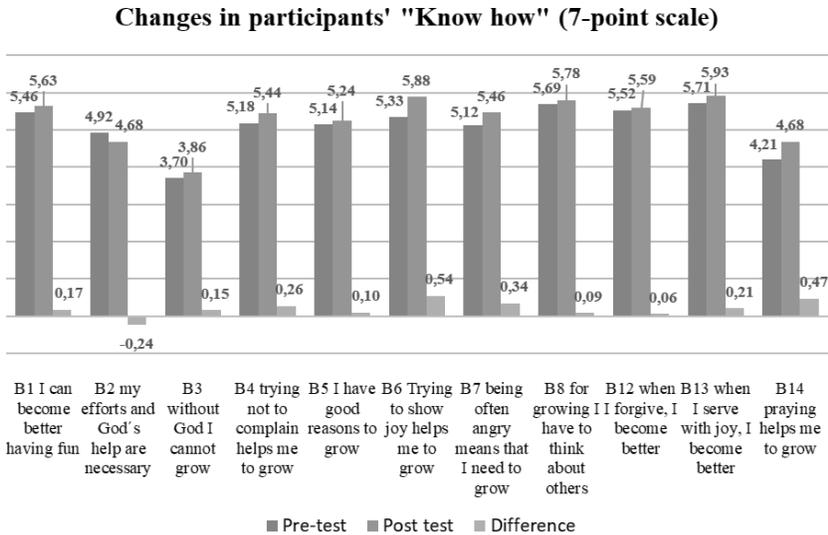
Figure 2. Character growth "know-how": Pre-test, post-test, Mean differences

In both pre-test and post-test, children's highest agreement was with statement B13 ("When I help others and serve them with joy, I become a better person"), and the lowest – with B3 ("Without God's help I cannot improve myself at all"). Comparing pre-test and post-test, the mean for each statement was also slightly higher after intervention, except for the statement B2 ("For becoming a better person, I absolutely need to make efforts and to ask God for help"), in which the post-test was slightly lower (Mean decrease: -0.24 in a 7-point scale). The biggest increment was in statements B6 ("When I make efforts to smile and to be cheerful, I become a better person and I help others to become better persons": +0.54) and B14 ("To pray helps me very much to become a better person": +0.47). These differences were not statistically significant (B6: p = .076; B14: p = .160).

Summarizing, it seems that children participating in the intervention had a (not statistically significant) tendency to demonstrate higher character growth mindset and practical knowledge in the post-test.

Discussion

The high impact of the intervention on participants' conviction that making efforts to be cheerful helps them and their friends to become

better persons (item B6) has a particular resonance with the theory of the relational-self-of-virtue (Fernández González, 2019). Cultivating a relational-self-of-virtue implies a particular kind of motivation, i.e., growing in virtue for the sake of others, in order to help them better to grow in virtue and to establish more caring relations with them. In addition, according to this theory, caring for others' growth in virtue is a privileged way of developing one's own full potential for virtue growth. On the other hand, the low impact observed in other relational criteria, such as knowing how to help others (A8 and A9), thinking about others (B8) and forgiving others (B12), indicates that children need guidance to develop this aspect of the relational-self-of-virtue. This finding could indicate that caring for others is a characteristic feature of latter stages of moral development. This confirms the Aristotelian theory of the five stages of moral development as described by the Jubilee Centre (Jubilee Centre, n.d., 7–9): the feature "I can actively help to build up others in virtue" corresponds to the Stage 5 of moral development, whereas the intervention addressed rather a feature corresponding to the Stage 1, namely: "to rethink the strength of commitment to character growth".

Overall, the intervention had a positive impact on participants' character growth mindset, in particular regarding their perceived knowledge about how to become better persons (A5) and their conviction that everybody can become a better person (A6). In their interviews, the volunteers discussed some aspect that in their opinion enhanced the impact of the intervention. One of them was the centrality of the example of the staff and volunteers, and of young participants themselves. In an open question, a leader commented on the relevance of good example: "*I think that youngest boys involve in becoming better persons when they are inspired by their own friends and by youngsters who are just a bit older than them*" (a leader). This confirms that "we develop virtues almost by accident… through observing how others live and emulating or rejecting how they go about life." (Jubilee Centre, n.d., 3). Young volunteers' modelling was particularly effective, because they were "near peers" to the children (Harrison, Morris, & Ryan 2016, 147). Their work corresponded to the highest level ('enhancing') indicators of the 'School Ethos Self-Evaluation Framework' (see section "Whole School Community" in Harrison, Arthur, & Burn, n.d., 32 and 57): they all were aware of the focus of the intervention, integrate it into the context of activities, purposefully modelled the behaviours expected by the camp ethos, and actively acted as role models to the children, who accepted them as such.

However, for some volunteers it was hard to say if the intervention really helped the children: "*I helped in specific situations, but I do not know if a specific situation really helps. I mean, you need to do things multiple*

times before you really improve" (a volunteer). Most of them believed they somehow helped the children to understand the main idea of the camp: "*I think yes* [it helped]*, because…they are still kids, and when they lose they get discouraged, complain, start bordering their colleagues... these are very good occasions to help them to think that they should be kind and help those who are not so skilled*" (a volunteer). As one of the leaders summarized: "*I do not think that the research itself… marked a difference. However, the good preparation of the contents of the intervention, and the good example they saw, has certainly helped children to grow, even if it is not quantifiable*" (a leader). Finally, all leaders stressed that the intervention helped to professionalize their work, which was one of the goals of the collaboration: "*definitively, it was a step forward… it was very good to have an integrated educational plan that embrace everything*" (a leader), and "*the parents perceived it in a very positive way"* (a leader).

Conclusion and recommendations

Building on two emotional-cognitive aspects of relational-self-of-virtue theory (character growth 'mindset' and character growth 'practical knowledge'), this intervention aimed at helping children to understand better that everyone can improve his/her character (including themselves), and to improve their practical knowledge about what to improve and how to do it. The intervention contained "taught" and "caught" elements, including group lectures and reflection time, individual coaching, an adapted "Character Growth Card", visual materials and, most important, the modelling of a team of 14 leaders and young volunteers highly identified with the formative goal of the intervention. The intervention impact was evaluated through the voices of children, volunteers and leaders, using triangulation of quantitative (questionnaires) and qualitative (interviews, open questions) methods. The intervention had a relative positive impact on children's character growth mindset and practical knowledge, in particular on their opinions about the possibility for everyone to become a better person.

This pilot intervention contributed to professionalize the NGOs work, and its implementation and assessment procedures could be used in future similar camps. Considering the limits of the study, some recommendations for next steps were put forward: This study relied mostly on participants' self-reports; therefore, for enhancing reliability, using observations and moral dilemmas could be advisable in the future. More separation between pre-test and post-test, for example during a semester, could provide stronger evidence about the impact of the intervention. Using a control group in a future research could be useful for enhancing reliability. A longitudinal

study for controlling the persistence of the learned lessons over time (6 months or more) would be necessary.

It could be concluded that such a program, with the necessary improvements, might probably enhance children's sustainable understanding of the possibility of growing in virtue and how to do it, which could motivate them to develop further their own character, and to help their friends to do so.

Acknowledgements

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TEACHER TRAINEES' EXPERIENCES OF INCLUSIVE PRACTICES DURING TEACHING PRACTICE

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ABSTRACT

Teaching practice has been found to significantly improve teacher trainees' understanding of special educational needs (SEN) and knowledge of inclusive teaching practices. Using a descriptive survey design and a purposive sample of final-year teacher trainees (n = 171), college supervisors (n = 57) and school-based mentors (n = 77) from three public colleges of education in Ghana, this study explored teacher trainees' experiences regarding the inclusive practices they learnt, their collaboration with stakeholders and the challenges they encountered during teaching practice. The study reveals that teaching practice does not adequately promote inclusive practical training of teacher trainees and that mentors do not model effective inclusive practices for trainees. The study found an immeasurably small number of co-teaching practices among trainees. The implications of the findings for the improvement of teaching practice in effectively training teachers in areas of SEN and inclusive education in colleges of education are also discussed.

Keywords: Inclusive education, Inclusive practices, Teaching practice, Teacher trainees.

Introduction

The participants of the World Education Forum in Dakar, Senegal (26–28 April 2000), established that it is the human right of all children, young people and adults to benefit from an education that is capable of meeting their basic needs in the best and fullest sense of the term, an education that includes learning to know, to do, to live together and to be (UNESCO, 2000). To achieve these goals, the participants promised to create a safe, healthy, inclusive and equitably resourced educational environment

that is conducive to the learning and achievement of all children. Inclusive education has been described in the Salamanca Statement as "regular education with child-centred pedagogy capable of meeting the special needs of pupils" (UNESCO, 1994, p. 5). Inclusive education aims to transform schools by eliminating all forms of discrimination, so as to offer quality education for all, while respecting and celebrating diversity in relation to the learning needs, abilities and characteristics of all students. It is about schools creating inclusive cultures, producing inclusive policies and evolving inclusive practices (Ainscow et al., 2006).

Building on international declarations as well as national commitments – such as sections of the 1992 Constitution of Ghana, the Education Strategic Plans of 2003–2015 and 2010–2020 and the National Development Agenda to achieve Education for All – Ghana has adopted inclusive education within the framework of Universal Design for Learning as a strategy to address the diverse learning needs of all students. The policy seeks to attain inclusive education for all persons with to and severe SEN at all levels of education (Ministry of Education, 2015). Hence, several studies and reports (e.g. Alhassan, 2014; Ministry of Education, 2015; Singal et al., 2015) have confirmed that, due to the limited provision of special education facilities and in line with the policy of inclusive education, a majority of students with SEN are attending mainstream schools. This finding is consistent with other studies from sub-Saharan African countries (Arbeiter & Hartley, 2002; Sawhney, 2015).

However, similar reports and studies have also established that, due to certain barriers, students with SEN in mainstream settings are largely ignored and denied active participation in the classroom (Casely-Hayford et al., 2013; Sawhney, 2015). Meanwhile, inclusive education involves valuing, supporting and increasing the full participation of all students within the cultures, curricula and communities of mainstream educational settings (Ainscow et al., 2006; Dyson, 2014). Barriers to the implementation of inclusive education include inaccessible school buildings, lack of appropriate facilities in schools, lack of appropriate teaching and learning materials, lack of extra support in the classroom for children with disabilities, social stigma and negative societal attitudes to disability and poverty. In addition, inadequate teacher training has been identified as another key barrier to the implementation of inclusive education in Ghana and other African countries (Agbenyega & Deku, 2011; Alhassan, 2014; Alhassan & Abosi, 2014: Le Fanu, 2013). Studies have also found that initial teacher education programmes do not adequately equip teachers with the knowledge and skills required for inclusive practices (Nketsia, Saloviita, & Gyimah, 2016; Nketsia & Saloviita, 2013). Hence, mainstream classroom teachers lack the requisite knowledge and skills to

adequately address the special needs of students in mainstream classrooms. The dominant instructional approaches adopted by mainstream classroom teachers generally take the form of teachers asking questions and writing on chalkboards, with students passively listening, writing and shouting out answers (Le Fanu, 2013; Sawhney, 2015). This raises critical questions with respect to the adequacy of initial teacher education programmes, especially the teaching practice component, to effectively equip trainees with inclusive practices. Inclusive practices are the actions that teachers take to give meaning to the concept of inclusion; they are the practices that respond to the diversity among learners (Florian & Black-Hawkins, 2011). Studies have shown that a lack of inclusive practices results in the social isolation and marginalization of students in inclusive settings (Sawhney, 2015) and that their adoption have yielded positive results (Florian & Black-Hawkins, 2011).

Globally, initial teacher training has been found to play a crucial role in preparing teachers to successfully implement inclusive education (Arbeiter & Hartley, 2002; Dart, 2006; Florian & Rouse, 2009). This important role has been emphasized in several international documents, such as UNESCO's Policy Guidelines on Inclusion in Education (2009) and the 2006 Convention on the Rights of Persons with Disabilities. Collectively, these documents agreed that pre-service and in-service teacher education programmes should adopt inclusive education approaches and materials in order to equip prospective teachers with the appropriate inclusive skills, knowledge, attitudes and pedagogical capacities to enable them to address the diverse learning needs of different categories of learners.

In an attempt to prepare teachers for inclusive settings, different initial teacher education programmes have added one or two separate SEN courses to equip teacher trainees with the appropriate knowledge, skills and competencies to be effective inclusive teachers (Sharma et al., 2008; Strawderman & Lindsey, 1995; Welch, 1996). However, some studies have established that one or two SEN courses are inadequate to provide teacher trainees with the necessary knowledge for the expected roles, functions and responsibilities required of inclusive education settings (Jelas, 2010; Wolfberg et al., 2009). Globally, many of these courses have been found to provide limited knowledge on SEN and inclusive pedagogical skills and have lacked focus on practical issues (Dart, 2006; Lawson et al., 2013; Nash & Norwich, 2010; Tungaraza, 2014).

Consequently, trainees and qualified teachers have expressed feelings of ill-preparedness with regard to dealing with SEN and disability issues within inclusive classrooms (Chhabra et al., 2010; Lambe & Bones, 2006; Lawson et al., 2013; Sawhney, 2011; Sharma et al., 2008). The evidence suggests that higher education-based training and education alone do not

result in professional reflection (Nash & Norwich, 2010). The creation of classroom settings that are inclusive of all students requires the training of regular education teachers in receiving adequate knowledge and high-level exposure to theory and practice regarding how to address the diverse needs of students with SEN. To address the aforementioned shortcomings of the one to two SEN courses in initial teacher education, many researchers have recommended that trainees be provided not only with theoretical knowledge but also with school placement opportunities in inclusive settings to effectively develop their attitudes towards disabilities as well as skills to enable them to address the special needs of all students (Dart, 2006; Lambe, 2007).

Indeed, several studies have identified school-based learning (teaching practice) as a relevant aspect of teacher education and training for inclusive education (Dart, 2006; Florian & Rouse, 2009; Lawson et al., 2013; McIntyre, 2009; Nash & Norwich, 2010). These studies have established that well-structured teaching practices or field-based experiences can effectively improve trainees' knowledge and understanding about SEN and inclusive education practices. One key feature of such teaching practices is that trainees spend more time in school placement, thus shifting some of the responsibilities of their knowledge development regarding issues of SEN and inclusion to placement schools. Teaching practice includes innovative structured fieldwork approaches, such as the involvement of a practical teaching task that is SEN- and student-focused, though it does not focus on practical teaching (Lawson et al., 2013; Strawderman & Lindsey, 1995). These planned tasks are designed to enable trainees to engage in direct teaching experience with an individual learner with identified SEN under the supervision of a SEN coordinator in order to significantly improve trainees' knowledge and understanding about SEN and inclusive practices (Dart, 2006; Lawson et al., 2013; Nash & Norwich, 2010). So far, it is not known whether the one-year teaching practice in the colleges of education in Ghana includes planned practical tasks with an individual or group of students with identified SEN or provides school-based formative, reflective and assessment tasks to promote critical reflection among student teachers.

Moreover, studies have shown that the teaching practices of trainees during school-based placement are mostly determined by their mentors and that these mentors can prevent them from innovatively practicing what they were taught in their initial teacher education programme (Angelides et al., 2006). Therefore, to effectively adopt teaching practice as an approach to equip teacher trainees with knowledge and understanding about SEN and inclusive practices, placement schools and mentors must be carefully selected. Placement schools must have quality inclusive education provisions, training support systems and well-trained mentors who can

provide trainees with quality SEN and inclusive training (Nash & Norwich, 2010). Schools which support inclusive education promote positive attitudes among its teachers. Moreover, the mentoring of newly qualified teachers under the supervision of experienced teachers with an inclusive philosophy has positive implications for inclusive teacher education. This enables teacher trainees to develop a commitment to inclusion (Forlin, 2010, p. 251). However, it is unclear what impact the one-year teaching practice has on trainees and the knowledge and understanding of SEN and inclusive practices they are exposed to by mentors.

Mentoring creates opportunities for teachers' voices to be heard and provides a bridge between theory and practice; above all, it allows for the co-construction of knowledge between newly trained teachers and mentors to create a community of practice to support each other through informal professional learning, which is an important component of teacher education (West, 2010). Such experiential learning opportunities and mentorship have been found to be effective in preparing teachers to apply their new knowledge in classrooms (West et al., 2006) and can significantly promote teacher training in inclusive education (EADSNE, 2012). For this to become a reality, teacher education programmes must work in strong partnership with placement schools on practical activities for teacher training on SEN and inclusive education (McIntyre, 2009). Apart from the nature and quality of the partnership arrangement between initial teacher education programmes and partner schools, the quality of training that student teachers receive in their partner schools also depends on the clarity of the responsibilities and the communication between the partners (Nash & Norwich, 2010).

Furthermore, West (2010) considered opportunities for collaboration, consultation and problem solving across common educational environments as other essential elements of teaching practice in the effective training of teacher trainees. Thus, trainees and beginning teachers should be given opportunities to work collaboratively with stakeholders to build their confidence, knowledge and skills. Such collaboration with mentors, fellow trainees and parents has been found to influence trainees' guidance in their teaching more so than collaboration with their college lecturers and tutors (Clarke et al., 2012). Currently, the nature of trainee collaboration with other stakeholders during teaching practice is unknown.

Teaching practice in Ghana's colleges of education

The three-year teacher education diploma programme for basic school teachers in Ghana follows an 'in-in-out' scheme in which trainees spend the first two years in the college carrying out course work. They then

spend their final year in a basic school classroom teaching, acquiring practical classroom experience and developing teaching competencies with the support of in-service teachers (mentors) and college-based teacher educators (supervisors). During teaching practice, trainees prepare weekly lesson plans, which are evaluated by their supervisors. Supervisors also embark on a series of scheduled visits to observe and examine lessons and to provide feedback (Akyeampong et al., 2012). Ghana's recent inclusive education policy emphasizes the training of pre-service and in-service teachers in inclusive education to enable them to identify and respond to the needs of each child, promote diversity in the classroom and make schools' curricula, assessment procedures, teaching and learning materials accessible and fair for all learners (Ministry of Education, 2015). However, it is not clear the extent to which the teaching practice component of the pre-service teacher training promotes the training of pre-service and in-service teachers in inclusive education to enable them to identify and respond to the needs of each child. Therefore, the specific objective of this survey was to determine trainees' experiences of SEN and inclusive practices during teaching practice. The study set out to determine:

1. The main activities mentees performed during teaching practice
2. Inclusive practices trainees learned during teaching practice
3. Mentees' collaboration with other stakeholders during teaching practice
4. The challenges faced by mentees in addressing SEN among pupils during teaching practice.

Methodology

Study Participants

The participants comprised 171 final-year teacher trainees (mentees), 57 college course tutors (supervisors) and 77 school-based practicing teachers (mentors) from three public colleges of education in Ghana. For the purpose of the study, participants with particular characteristics were of highest interest to the study; the supervisors were college course tutors who were involved in teaching practice supervision; the mentors were school-based practicing teachers who were responsible for mentoring the final-year teacher trainees in the placement schools; and the mentees were the final-year teacher trainees on teaching practice.

A description of the participants' demographics is presented in Table 1. All the mentees had completed a course on SEN, had their teaching practice in a mainstream basic school and indicated that they identified pupils with disabilities and SEN during their teaching practice. According to the mentors, the number of pupils with SEN in their various classes

ranged from 1 to 10 (M = 2.03, SD = 1.51). The sizes of the classrooms taught by the trainees ranged from 30 to 100 (M = 51.22, SD = 15.58).

Table 1. Description of participants

Partici-pants	N	Return Rates	Gender %		Age		Qualifications %			
		%	Male	Female	Range	M	Certifi-cate A	Diplo-ma	De-gree	MA/ *MPhil*
Mentees	171	63	57	43	23–33	26.8	-	-		
Supervisors	57	38	75	25	28–61	45.0	-	1	25	74
Mentors	77	57	61	39	23–61	40.1	10	43	45	2

Instruments

The aim of this study was to explore the final-year teacher trainees' experiences during teaching practice. Hence, the quantitative descriptive survey design employed involved the administration of a written questionnaire that mainly consisted of open or free-response questions (Oppenheim, 1992; Pallant, 2016). The questionnaire was designed from previous studies on initial teacher preparation in enabling teachers to meet the needs of students with disabilities (see e.g. Clarke et al., 2012: Dart, 2006; Forlin, 2010; Lawson et al., 2013; Nash & Norwich 2008, 2010; West, 2010). A draft of the questionnaire was reviewed by two academics outside the research team, who had research interest in teacher preparation for inclusive education, to ensure that relevant data were collected to address the research questions. The final draft was tried on twenty teacher trainees from a college of education that was not included in the study. The questionnaires were then amended based on the pilot report before the data collection.

The questionnaire consisted of two main sections for all the respondents of the three different surveys. Section A elicited information on the respondents' backgrounds (e.g. age, gender, qualifications, completion of SEN course, etc.). Section B consisted of a varied range of closed- and open-ended questionnaire items. One dichotomous question with response options (1 = Yes, 2 = No) required mentees to indicate whether they collaborated among themselves as mentees and with others during teaching practice. The open-ended questionnaire items requested all participants (mentees, mentors and supervisors) to describe the main activities that mentees performed during their teaching practice. Another open-ended item requested mentees and supervisors to describe assignments provided during the one-year teaching practice, which encouraged mentees to reflect on how to address the diverse learning needs of pupils. Also, the mentees

were asked to describe the best inclusive practices they learned during teaching practice, their collaboration with others and among themselves and the main challenges they encountered as far as addressing the special needs of pupils was concerned. Further, mentees who had the opportunity to observe the lesson delivery of their mentors were asked to describe the main instructional strategies used by the mentors during lesson delivery. The mentors were also asked to indicate the number of students with SEN in their class.

Data collection procedure

Due to the wide geographical spread of the placement schools, three colleges of education were conveniently selected on the basis of their familiarity, accessibility and proximity to the first author. They included College A situated in the Western Region, College B in the Central Region and College C in the Ashanti Region. A letter was then sent to all the principals of the selected colleges to seek their permission to collect the data. Following their consent, the first author contacted the teaching practice coordinators, the head teachers of the placement schools and the lead mentees to inform them about the study and sought their assistance with mentee recruitment. The first author personally delivered 200 survey questionnaires to mentees, 100 to mentors and another 100 to supervisors in all the accessible placement schools. To assure the participants of their confidentiality and anonymity, all the questionnaires contained cover letters explicitly explaining the purpose of the research and requiring them not to indicate their names or that of their colleges. The participants were also informed that the completion of the survey implied their consent to participate in the study and that they were free to withdraw at any time. In all the schools visited during the data collection, two mentees were assigned to one mentor; therefore, they shared a classroom with the mentor.

Data analysis

The data obtained were analysed in two phases. First, the responses to the closed-ended questions were entered into the IBM SPSS Statistics Program 25. Simple frequency and percentage analyses were used in the analysis of the demographic data and the responses to the dichotomous question, which required mentees to indicate whether they collaborated among themselves during teaching practice. Second, coding frames were developed for each open-ended question (Oppenheim, 1992; Pallant, 2016). A convenient number of twenty questionnaires from the mentees and ten questionnaires each from the mentors and supervisors were used to develop the coding frame for each of the open-ended questions. Thus, each of the open-ended questions was copied on a separate Microsoft Word document, as

they appeared in the questionnaire, followed by all the responses to that question. Each answer was preceded by the case number.

Bearing in mind the aims of the study and the specific purpose of the question under consideration, the first and second authors coded the selected questionnaires independently, followed by a discussion and resolution of the differences between them to eliminate inconsistencies and ambiguities. The first author then used the agreed coding frames to code all the responses to the open-ended questions by highlighting and coding the specific segments of the responses. The first and second authors agreed on the themes under which to present the codes and the response segments to be extracted for analysis. The first author proceeded to write the first draft of the analysis, which was read and accepted by all the authors. Some of the major themes were assigned a numerical code and entered into the IBM SPSS Statistics Program 25, together with the quantitative data. The results were presented using simple percentages and frequency distribution tables.

Results

The main activities mentees performed during teaching practice

The mentees, mentors and supervisors were asked to describe the main activities that mentees performed during teaching practice. Seven broad themes emerged from the analysis: the preparation of lesson notes, preparation of teaching and learning materials, classroom teaching and learning, the management of student behaviour in the classroom, taking part in extracurricular activities and assessing students' academic performance. Observation of the delivery of lessons by mentors was mentioned by very few mentees (13%). Table 2 below summarises the broad themes.

Table 2. The main activities mentees performed during teaching practice

Main Activities	Mentees %	Supervisors %	Mentors %
Preparation of lesson notes	99	65	86
Classroom teaching and learning	88	95	91
Management of student behaviour in classroom	69	51	84
Taking part in extracurricular activities	79	70	82
Assessing of student academic performance	82	65	78
Preparation of teaching materials	100	63	70
Observing the delivery of lessons by mentors	13		

Inclusive practices mentees learned during teaching practice

The mentees were asked to list some of the best inclusive practices they learnt during their teaching practice, from which 12 major themes emerged, including writing boldly on the chalkboard (66%), speaking louder (61%), code switching (60%), questions and answers (56%), seating arrangements (50%), the use of teaching and learning materials (46%), the use of practical activities (45%) and revision of relevant previous knowledge (19%). However, only few mentees mentioned collaboration with parents (18%), cooperative learning (15%), collaboration with other stakeholders (14%) and the use of mixed-ability grouping (13%). Table 3 below summarizes the responses.

The next question asked the mentees to indicate whether they had an opportunity to observe the lesson delivery of their mentors during teaching practice and to list some of the teaching methods/instructional strategies most commonly used by their mentors. Only few mentees (12%) indicated that they had an opportunity to observe their mentors' lessons. The instructional strategies most commonly used by the observed mentors included lectures (62%), exchange of ideas among teacher and students through discussion (62%), demonstration (56%), asking and answering questions (49%), practical activities to engage student (33%), generating and gathering ideas through brainstorming (31%), role play (27%) and the discovery method (18%).

Table 3. The inclusive practices learnt by mentees during teaching practice

Inclusive Practices	Trainees (N = 171) %
Writing boldly on the chalkboard	66
Speaking louder for everyone to hear	61
Code switching to ensure understanding	60
The use of questions and answers to engage students	56
Arrangement of seats	50
The use of Teaching and learning Materials	46
Engaging students in practical activities	45
Revising relevant previous knowledge	19
Collaborating with parents	18
Cooperative learning	15
Collaboration with other stakeholders	14
Mixed ability grouping	13

Mentees' collaboration during teaching practice

The mentees were then asked to indicate whether they engaged in collaboration among themselves as mentees and with other stakeholders during teaching practice and to describe how they collaborated. Almost all of them (95%) indicated that they had collaborated. The coding yielded nine categories, all of which were related to their collaboration among themselves. Therefore, all the categories were organized under an umbrella theme 'mentees' collaboration among themselves'. The mentees collaborated by discussing examination papers (61%), assisting each other in preparing teaching and learning materials (49%), sharing ideas on how to plan lessons (47), consulting each other on subject matter (45%), consulting each other on appropriate teaching methods (23%) and co-teaching (8%).

Additionally, the mentees were asked to mention whether their assignments or course work made them reflect on how they addressed the learning needs of pupils with SEN in their placement classroom. The supervisors were asked to indicate whether they provided mentees with assignments or coursework during the one-year teaching practice that made mentees reflect on how they addressed the diverse learning needs of students with SEN. The mentees and supervisors were then asked to list some of the assignments provided. Only nine percent of supervisors indicated that they had provided mentees with assignments; seven percent mentioned that they had provided assignments relating to guidance and counselling, and five percent indicated that they had provided assignments relating to classroom management. However, none of the mentees confirmed that such assignments had been provided during teaching practice.

The challenges faced by mentees during teaching practice

In the final part of the survey, all mentees were asked to list the main challenges they encountered during their teaching practice as far as addressing the diverse learning needs of students was concerned. The coding yielded eighteen categories, which were organized under five major umbrella themes, namely: students' characteristics, teachers' characteristics, collaboration with stakeholders, physical environment and resources.

Under the 'students' characteristics' theme, the mentees indicated that the diverse learning needs of students and lack of interest of students in learning presented enormous challenges to them during teaching practice. Under the 'teachers' characteristics' theme, they mentioned inadequate teacher preparation and their inability to engage all students in lessons. With regard to collaboration with stakeholders, the mentees found lack of parental cooperation to be most challenged during teaching practice. They also indicated that the lack of teaching and learning materials presented

enormous challenges in terms of resource availability. Under the 'physical environment' category, large class sizes and inaccessible physical environments were mentioned. The results are presented in Table 4.

Table 4. Challenges trainees encountered as far as meeting the special needs of pupils were concerned

Challenges encountered by Mentees	Mentees (N = 171) %
Student characteristics	
Stigmatization of students with SEN	49
Students' lack of interest in learning	44
Emotional and behavioral problems among students	43
The diverse learning needs of students	40
Resources	
Lack of teaching and learning materials	59
Inadequate desks	37
Lack of specialists to assist us	32
Teacher characteristics	
Inadequate teacher preparation to address the special needs among students	50
Lack of skills to engage all students in lesson	33
Physical environment	
Large class size	45
Inaccessible physical environment	37
Collaboration with stakeholders	
Lack of parental cooperation	30
Lack of cooperation with mentors	41
Lack of well-trained mentors	38

Discussion

Authentic opportunities are required in order for teacher trainees to exercise their capabilities of translating theory into practice. One such opportunity is school-based learning (teaching practice), which forms part of many initial teacher education programmes. The first question in this study sought to describe the main activities that mentees performed during teaching practice. The main activities consistently mentioned by mentees, mentors and supervisors included preparation of lesson notes and teaching and learning materials, teaching and assessing student performance and

management of student behaviour. These findings reflect those of Kuyini and Desai (2009), who observed that the teaching practices of regular classroom teachers were limited to class management and lesson presentations. One unanticipated finding was that only few mentees indicated that they had observed the lesson delivery of their mentors as part of the main activities performed during teaching practice. This is surprising because during teaching practice, two mentees share a classroom with their assigned mentor. It can therefore be assumed that mentees' observation of mentors' demonstration of inclusive attitudes, knowledge and skills is not a planned task or an expected activity during teaching practice. Previous studies have established that such observations by mentees promote critical reflection among mentees about their classroom teaching experiences (Dart, 2006; EADSNE, 2012; Nash & Norwich, 2010).

Although the majority of mentors indicated that there were students with SEN in their various classes, the few mentees who had the opportunity to observe their mentors' lesson delivery indicated that the instructional approaches adopted by their mentors mainly included lectures, discussions, demonstrations, questions and answers, brainstorming, role play and the discovery method. These instructional approaches were likely to be unresponsive to the minority of students with SEN and disabilities. This finding is consistent with that of Agbenyega and Deku (2011), Alhassan and Abosi (2014) and Kuyini and Desai (2009), who found that regular classroom teachers in Ghana are unable to make adequate instructional adaptations to support children with disabilities. Inclusive education requires teachers to modify and adapt the curriculum and instructions to meet the diverse needs of students.

Consequently, some mentees and the majority of supervisors mentioned a lack of well-trained mentors and a lack of cooperation with mentors as some of the challenges they encountered in relation to addressing the diverse learning needs of students. It could therefore be argued that mentees might not fully benefit from observing mentors in terms of the acquisition of basic inclusive teaching competences. Studies have shown that mentees' views, beliefs and practices are mostly determined by their mentors (Angelides et al., 2006) and that they learn inclusive teaching practices from them during the mentoring and supervision process (Lawson et al., 2013). It is evident that the mentors themselves require professional development for the implementation of inclusive education. In-service teachers in similar contexts have expressed the need for 'in-house mentorship' and continuous professional development to equip them with key inclusive values and competences (Mangope & Mukhopadhyay, 2015). This could also equip mentors with the capabilities to model appropriate inclusive teaching practices for trainees.

With respect to the second research question, the most frequently mentioned inclusive practices mastered by the mentees were writing boldly, loud speaking, code switching to ensure understanding and questions and answers. Despite the presence of pupils with SEN in most classrooms, the teaching strategies adopted by both the trainees and mentors were less related to inclusive, child-centred and constructivist teaching approaches and did not require changes to planning and the curriculum, neither were adjustments made to the materials and instructional practices for special learners. Key inclusive practices – such as the physical arrangement of seats, revising previous knowledge, cooperative learning, mixed-ability grouping and collaborating with parents and other professionals – were only mentioned by a minority of mentees. Teachers who are committed to inclusive practices encourage cooperative and heterogeneous learning groups, activity learning, different seating arrangements and differentiated instructional approaches.

Globally, studies have shown that teaching practice can promote critical reflection among student teachers (Angelides et al., 2006; Clarke et al., 2012; Nash & Norwich, 2010) and effectively prepare inclusive teachers (Dart, 2006; Lawson et al., 2013). The study showed that only a few supervisors provided assignments during teaching practice aimed at encouraging critical reflection among mentees. The assignments were only related to guidance counselling and classroom management. However, this account by the supervisors was not corroborated by the mentees. The presence of pupils with SEN in regular classrooms in Ghana presents an opportunity to assist trainees to familiarize themselves with inclusive practices and the needs of pupils with SEN. The findings of this study show that such opportunities were not deliberately created, suggesting that more needs to be done to ensure that these opportunities are fully utilized to equip trainees with inclusive practices. Teaching practice must create opportunities for trainees to examine their own beliefs and learn how to address the diversity of needs in the classroom (Jordan et al., 2009). The use of SEN/disability-related tasks during teaching practice has a significant impact on trainees' knowledge and understanding of SEN as well as their attitudes towards inclusive education (Arbeiter & Hartley, 2002; Dart, 2006; Lawson et al., 2013). Other promising teaching practice strategies include enabling trainees to become engaged in the direct teaching experience of pupils with identified SEN (Lawson et al., 2013), writing of portfolios (Angelides et al., 2006), assessment methods such as essays about SEN/disabilities, teaching plans and reports about teaching individuals and/or groups of pupils with SEN and peer- and self-review methods (Nash & Norwich, 2010).

As part of teacher training, trainees should be provided with professional learning opportunities, such as consultation, coaching, communities of

practice, mentoring, reflective supervision and technical assistance, etc. so as to develop collaborative skills that will enable them to engage in effective collaborative teaching (West, 2010). In this study, a majority of the trainees reported collaborating with their fellow trainees in study circles to discuss exam papers for external examinations, assisting each other with the preparation of teaching and learning materials, sharing ideas on how to plan lessons and consulting each other on subject matter and appropriate teaching methods. Only a minority actually engaged in co-teaching. These findings suggest that the mentees felt more comfortable consulting their fellow mentees to share ideas about teaching and learning than actually engaging in co-teaching with them. Co-teaching – a teaching approach whereby two or more people share responsibility for teaching – has been found to be effective in assisting teachers to serve all students fairly and equitably in general education classrooms (Villa et al., 1996). In the current study, while two trainees practiced their teaching in one classroom, only a few of them indicated that they had collaborated by means of co-teaching. Unsurprisingly, co-teaching was not identified as one of the best inclusive practices learnt during teaching practice. This might be partly attributed to the insufficient amounts of attention being paid to the development of trainees' co-teaching skills, thus resulting in a lack of such skills among trainees. Also, perhaps the importance of collaboration with other teachers through co-teaching might not have been taught or modelled to the trainees and was not part of the expected activities they had to perform during teaching practice. Elsewhere, trainees on teaching practice are expected to carry out co-teaching with their mentor in the early stages of their teaching experience in order to familiarize themselves with routines and programmes (Western Sydney University, 2018). Studies in similar contexts have found that while teachers acknowledged the importance of collaboration in implementing inclusive education, they lacked the skills to implement it (Mangope & Mukhopadhyay, 2015; Swart et al., 2004). The ability of teachers to co-teach has been attributed to their pre-service and in-service training programmes (Villa et al., 1996). What is surprising is that the majority of mentees reported collaborating with their fellow trainees in study circles to discuss exam papers for external examinations. This finding arguably confirms the dominant examination-oriented culture in colleges of education and shows how it affects trainees' teaching practice.

Lastly, the mentees identified several factors that challenged their capacity to meet the special needs of pupils during teaching practice. The stigmatization of students with SEN was one of the challenges regarding students' characteristics most mentioned by the mentees. In Ghana, people tend to have strong views about disability, which are often based on stereotypes and traditional beliefs (Dako-Gyeke & Asumang,

2013). This finding raises intriguing questions about the effectiveness of public education regarding issues of disability in Ghana and implies that the government must invest more effort and resources in public sensitization programmes. Other challenges relating to students' characteristics included students' lack of interest in learning, emotional and behavioural problems among students and the great diversity in students' learning needs. These results are likely to be related to ineffective teacher preparation, resulting in an obvious lack of capacity among mentees in utilizing teaching strategies to effectively respond to the diversity of needs and abilities among pupils. Respect for diversity is a key inclusive value; diversity is a rich resource for learning, rather than a problem, and inclusive education welcomes diversity amongst all learners (UNESCO, 2009). Therefore, these findings suggest that teacher education programmes must be reformed to equip teachers with the understanding that students are individuals with diverse characteristics, interests and strengths and that they need to adopt different instructional strategies to engage students based on their diverse learning needs, interests and characteristics in the inclusive classroom.

Research has established that teachers need additional personnel assistance, adequate material resources, reduction in class sizes and accessible physical environments in order to effectively implement inclusive education (Scruggs & Mastropieri, 1996). The mentees in this study encountered resource and physical barriers, such as lack of teaching and learning materials, inadequate desks and lack of specialist assistance, large class sizes and inaccessible physical environments. Above all, the majority of mentees described their own initial teacher education programme as ineffective in preparing them to address the special needs among students, and less than half indicated that they lacked the skills to engage all students in their classroom. These challenges are consistent with those cited by previous studies as barriers to the adoption of inclusive practices (Croft, 2010) and to achieving meaningful inclusive education in Ghana and other low-income countries (Casely-Hayford et al., 2013). These challenges have been found to impact negatively on teachers' attitudes toward inclusive education and are of great concern to teachers with regards to the implementation of inclusive education (Avramidis et al., 2000; Chhabra et al., 2010; Sawhney, 2015; Swart et al., 2004). Several authors have argued that these local contextual factors influence the way in which teaching strategies are interpreted, adapted and implemented (Tabulawa, 2013); thus, the teaching methods used by trainees and mentors might have been dictated by the conditions under which they teach. Moreover, collaboration with key stakeholders, such as other educational professionals, special educators, parents and communities, has been regarded as a core value for all teachers working in inclusive education (UNESCO, 2005).

However, the present study described key stakeholders, such as parents and mentors, as uncooperative. This finding strengthens the earlier call for the implementation of professional development opportunities for key stakeholders, such as mentors and parents, to equip them with knowledge and skills to collaborate with mentees. Moreover, skills and strategies for collaboration should be incorporated into the teacher education curriculum to prepare mentees.

Limitations of the current study

The results of this study should be interpreted with due caution because of a number of limitations. First, to collect data, the study depended only on the accounts of pre-service teachers in conveniently selected schools. The pre-service teachers undertaking their teaching practice in different schools might have had different experiences from those reported here. We recommend that future studies adopt probability sampling to increase the generalizability of the results. Second, although the current study used a great deal of open-ended questions, the amount of space provided for the answers might have determined the length and fullness of the responses obtained. Future studies should adopt qualitative data collection approaches, such as interviews and observation, to capture information regarding the teaching practice experiences of pre-service teachers. Notwithstanding these limitations, this work offers valuable insights into the main activities that mentees perform during their teaching practice, the inclusive practices they learn during teaching practice, the extent of the collaboration among themselves during teaching practice, the impact of teaching practice on them and the challenges they face in addressing SEN among pupils during teaching practice.

Implications for policymaking and conclusion

This study showed that the presence of SEN pupils in mainstream classrooms was not fully utilized to prepare teachers on issues of SEN and inclusive practices. Teaching practice in initial teacher education should be reformed to improve teacher training for inclusive education. To support trainees' learning on SEN and inclusion, teaching practice could, for example, incorporate planned pupil-focused SEN and disability tasks, writing of portfolios and essays about SEN/disabilities. Such task designs have been found to improve trainees' learning about pupils with SEN and teaching approaches of relevance for them. They have also been found to promote attitudinal change and critical reflective practices among trainees.

Also, the current study found that the mentors demonstrated inadequate inclusive pedagogical approaches. This stresses the need for professional development opportunities for school-based mentors to equip them with inclusive attitudes, knowledge and skills so as to enable them to effectively support trainees. Two trainees practicing teaching in the same classroom is a golden co-teaching opportunity. However, only few trainees took advantage of this opportunity. The current data highlight the need for more attention to be paid to the development of collaborative skills among trainees. The importance of collaboration with other teachers through co-teaching must be taught and modelled to trainees. Further research could be carried out to specifically determine the extent to which mentoring and supervision of teaching practice can equip trainees with inclusive practices.

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THE ROLES OF THE ONLINE ENVIRONMENT IN SCHOOL–FAMILY COMMUNICATION

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ABSTRACT

The study focused on the issue of increasing communication efficiency between school and family using the online environment. The aim of the study is to evaluate to what extent the online communication environment can improve the process of communication between school and family. The study is quantitative, based on the questionnaire method. Two questionnaires were distributed in the online environment to teachers and parents. Both questionnaires showed that the communication relationship between school and family is not very efficient; this being the reason for hypothesizing that online communication between parents and teachers could be a solution to this issue. In this context, both investigated samples foresee the benefits of a communication relationship between school and family in the online environment and do not consider that information transmitted in this way differs from that transmitted in a direct conversation.

Keywords: Communication, School, Family, Efficiency, Online Communication.

Introduction

Communication has always been a subject of interest for many disciplines, including philosophy. Ever since antiquity, philosophers across the world have reflected on communication, discovering its role in life, especially in social life. If we could summarize the whole history of philosophy, we could assert that in antiquity, communication ontology concerns were predominant. Communication is everywhere, and the field of communication has become vast. All human activities, individual or collective, revolve around information that is sent, received or analysed. Communication is part of action and reflection, just as currency is part of the economy (Zemor, 2003).

Digital competence is the most recent concept describing technology-related skills. During recent years, several terms have been used to describe

the skills and competence of using digital technologies, such as ICT skills, technology skills, information technology skills, 21st century skills, information literacy, digital literacy and digital skills. These terms are also often used as synonyms; e.g. digital competence and digital literacy (Adeyemon, 2009; Almås & Krumsvik, 2008; Krumsvik, 2008; Petersson, 2018). Sometimes the terms are narrow, e.g., Internet skills, referring only to a limited area of digital technology, while some of them widen the content to media and literacy, e.g., media literacy skills or digital literacy (Clipa & Colomeischi, 2013; Ilomäki, Kantosalo, & Lakkala, 2011; Ottestad, 2008; Petersson, 2018).

Students interact collaboratively with teachers and technology. Computers deliver and mark lessons, while the teacher acts as a facilitator and mentor (Bennett, 2002; Dooling, 2000).Furthermore, educators have "to accept changes…in [their] interactions…with students and they [have] to support students as their roles change, too" (Harris, 2002).

People not only socialize online, but they make use of the Internet in seeking information, exchanging advice and making decisions. Americans may now have only one or two extremely close relationships, but dozens of core and significant ties in the "networked" community (Boase et al. 2006).

In the circumstances, both the theoretical and practical studies will aim at focusing on presenting all the important characteristics which define the family environment, as well as those defining the school environment.

We chose to approach this issue because we wanted to identify as many relevant aspects as possible in this context, as well as wanting to apply, in the educational context, the new ideas from specific literature that already existed in this area of study.

All these basic considerations regarding the importance of this subject drew the interest of many specialists in this area of study, which is not recent, but is a part of human communication research and analysis, namely that of antisocial deviations. Cornell University offers a definition that works, but seems somewhat limited and dated as well: "Digital literacy is the ability to find, evaluate, utilize, share, and create content using information technologies and the Internet"(Melnikova et al., 2017; Olofsson, Lindberg, Fransson, & Hauge, 2015; Vanderlinde & van Braak, 2010).

This isn't wrong rather it focuses too much on technology and "the Internet". Literacy cannot be about the forms unless we're talking about form literacy. Digital tools exist for accessing information and finding better information'access, socializing thinking and spreading ideas; connecting and contributing to digital communities you care about (Heick, 2015; Petersen, 2014). In a study on the role of the Internet in families, it was found that 33% of Internet users said that the Internet had improved

their connections to friends "a lot", and 23% said Internet communication had increased the quality of their communication with family members by a similar amount. Young people in particular took advantage of the social side of the Internet. Nearly half (49%) of 18–29 year olds said that the Internet had improved their connections to friends a lot. On the other hand, 19% of employed Internet users said that the Internet had increased the amount of time they spent working at home (Eynon& Helsper, 2014).

Some studies focus on one-stop targeting, in which the seeds are selected by selecting the highest in-degree nodes and randomly selecting one of their neighbours (Kim et al., 2015). These studies hypothesized that the online social network is a strongly connected component, in which every node can gain access to the rest of the nodes in the network (Shakya et al., 2017).

In a study done in 2004, Boase and his colleagues (2006) found that even with the flourishing of the Internet, people still commonly communicated with their social ties in traditional ways, in addition to the use of the Internet for social communication. They found that in-person encounters were most widely used, followed by landline phone, cell phone, email, and IM communication. Far from being a medium that connects weaker ties in superficial ways, email was used more for maintaining core rather than significant ties.

Core ties are more often relied upon for seeking help than significant ties. But significant ties are composed of people more than acquaintances and can, at times, become important players in help-seeking. Boase and his colleagues (2006) found that people not only socialized online, but they incorporated the Internet into seeking information, exchanging advice, and making decisions. Americans may now have only one or two extremely close relationships, but dozens of core and significant ties in the "networked" community. Four years later in 2008, a similar study on social isolation and new technology found that in-person contact remained the dominant means of communication with core members; emails, instant messaging, and social networking websites supplemented this dominant mode of communication (Hampton et al. 2009). In a study done in 2004, Boase and his colleagues (2006) found that even with the flourishing of the Internet, people still commonly communicated with their social ties in traditional ways, in addition to the use of the Internet for social communication. They found that in-person encounters were most widely used, followed by landline phone, cell phone, email, and IM communication. Far from being a medium that connects weaker ties in superficial ways, email was used more for maintaining core rather than significant ties. Core ties are more often relied upon for seeking help than significant ties. But significant ties are composed of people more than acquaintances and can, at times, become important players in help-seeking. Boase and his colleagues (2006) found

that people not only socialized online, but they incorporated the Internet into seeking information, exchanging advice, and making decisions. Americans may now have only one or two extremely close relationships, but dozens of core and significant ties in the "networked" community. Four years later in 2008, a similar study on social isolation and new technology found that in-person contact remained the dominant means of communication with core members; emails, instant messaging, and social networking websites supplemented this dominant mode of communication (Hampton et al. 2009).

This paper considers a case study on making communication more efficient between school and family, using the online environment.

Methodology

The aim of the study

The study aims to assess to what extent the online environment can improve the school–family communication process.

The objectives of our study were:
1. The analysis of the communication relationship between school and family;
2. Identifying the extent to which the online environment influences school–family communication;
3. Identifying the most appropriate communication channels between school and family;
4. Assessing the extent to which the improvement of the school–family communication relationship through the online environment determines the improvement of the pupils' school performances.

Research hypothesis

The present study starts from the following hypothesis:
1. It is assumed that the online environment could improve the school–parents' communication frequency for parents.
2. It is assumed that there are differences regarding the preferences for the communication environment between parents and teachers.
3. It is assumed that there is a positive correlation between online communication between school and family and the improvement of the pupils' grades.

Participants and procedure

There were 120 respondents taking part in this research, 60 parents and 60 teachers. The two investigated samples had different ages and genders. Thus, regarding the gender a perfect proportionality was kept between mothers and fathers. However, the teachers did not have the same homogeneity, the female subjects being numerically superior. The ages of the parents who took part of the study were between 29 and 49, with an average of 38.13 years. The teachers' ages were relatively similar to the parents, between 27 and 52, with an average of 37.23 years.

The present study is quantitative based on the questionnaire method. This was distributed online. It was considered to be easier to share the questionnaire online, on 'iSondaje.ro'asit allows creating your own survey free of charge. The preliminary results could be seen immediately after the questionnaire was filled in by the respondents.

The data were also exported into Excel and SPSS. Similar toother methods of questionnaires dissemination, the online surveys were used on a large scale, thus receiving enough feedback can take a while, and the results can sometimes be irrelevant or errors may occur. In this study, only one questionnaire was applied for two different groups of subjects, so that the items' design was slightly different too, depending on the studied sample.

Results

In order to conduct the present research, education, age and place of origin were not taken into consideration as sample selection criteria. The data were collected through the Internet; all the questionnaires were delivered to different groups accessed by the target population on Facebook, then processed in SPSS. According to the literature, the samples size should be calculated with a 95% probability with an acceptable statistical error of 5%. The analysis of the two applied questionnaires begins with an assessment of the school–family relationship. In this context, from the parents' point of view, as presented in the table below, most of them, namely 43.3% assess the relationship with their children's school as a good one. It may be seen though that there is 6.7% of parents have no relationship to the school, describing it as being non-existent.

The opinions of the teachers to the same item are relatively different, most of the respondents, namely, 33.3% describing the school–family relationship as being distant. Another difference is the fact that 23.3% of the parents describe the relationship with the school as very good while only 16.7% of the teachers chose this answer.

Thus, teachers think that the relationship between school and family is more distant than the parents see it.

The next item assessed the frequency of the contact parents have with school, from their point of view. In this context, as it can be noticed below, most of the respondent parents (33.3%) claimed that they keep in touch weekly with school and their children's teachers. Forthe same item, only 3.3% of the parents asserted that they contact the school and teachers annually or never.

The teachers' opinion is different regarding this item too, with 26.7% asserting that parents get in touch with school every 2–3 weeks. Also, unlike the 3.3% of parents who claim to be in contact with school each year, the teachers claim that there are more than 10% of them.

The third item from both questionnaires focused on increasing the school–family communication frequency through online communication. In this context, 86.7% of the questioned parents agreed to this idea. Within this item, the teachers' opinions did not differ much from those of the parents, so that 76.7% of the questioned teachers answered affirmatively. The similarity of the teachers' and parents' answers can be noticed too in the correlation presented below (Table 1).

Table 1. Correlation of parents' and teachers' opinions

Correlations	Parents' opinion	Teachers' opinion
Parents' opinion	1	-.312
Teachers' opinion	-.312	1

There was a discussion on how online communication could improve the school–family relationship. In this context, 80% of the parents said that this online communication can improve the relationship with the school. In this case too, the teachers' opinion was relatively similar to the parents', so that 80% and 76.7%of them, respectively, asserted that they agree that online communication can improve the relationship with the parents.

Through this item, the first suggested hypothesis can be verified, by which it is supposed that the online environment would increase the frequency of the school–family communication for the parents. Thus, analysing the answers of both samples, it can be asserted that the hypothesis is confirmed, taking into account that more than 70% of the subjects answered affirmatively to this item. This hypothesis can be validated also by the correlation of the parents' and teachers' answers to the same question.

On this item, the subjects' opinions were different according to gender, so that it can be noticed in the table below, that the male teachers are more

optimistic regarding the improvement of the parents–school relationship with this type of communication. We tried to identify the most appropriate way to communicate online. In this case, most respondent parents, namely 33.3% considered WhatsApp as the most appropriate, followed closely by Facebook. The teachers' opinions were very different regarding this item. Thus, most of the respondents, namely 50% of them considered that the most adequate form of online communication with the parents is through a platform specially created for such discussions, the next method chosen in this context being represented by e-mail.

The second hypothesis, which assumes that there are differences in the preference for the communication environment between parents and teachers, is confirmed by this item, a fact which is also confirmed by the results presented above, indicating obvious differences between the two investigated samples.

The next item assesses the respondents' opinion regarding the online sending of messages, namely the idea according to which we can send the same information online as in a direct communication. In this context, most of the parents, specifically 73.3%, agreed to this assertion. The opinion of the teaching staff was not much different within this item either, 80% of the teachers believing that they could also transmit the same information in an online environment.

Teachers' beliefs, practices and attitudes are important for understanding and improving educational processes. They are closely linked to teachers' strategies for coping with challenges in their daily professional life and to their general well-being, and they shape students' learning environment and influence student motivation and achievement. Furthermore, they can be expected to mediate the effects of job-related policies – such as changes in curricula for teachers' initial education or professional development – on student learning. TALIS examines a variety of beliefs, practices and attitudes which previous research has shown to be relevant to the improvement and effectiveness of schools (OECD, 2018). The following table (Table 2) shows the negative correlation between parents' and teachers' opinion about the utility of Internet and technology in education.

Furthermore, teachers who readily integrate technology into their instruction are more likely to possess constructivist teaching styles. Evidence suggests there is a parallel between a teacher's student-centred beliefs about instruction and the nature of the teacher's technology-integrated lessons. This connection between the use of technology and constructivist pedagogy implies constructivist-minded teachers maintain dynamic student-centred classrooms where technology is a powerful learning tool(Judson, 2006).

Table 2. Correlation between parents' and teachers' opinion

		Parents' opinion	Teachers' opinion
Parents' opinion	Pearson Correlation	1	-.159
	Sig. (2-tailed)		.003
	N	60	30
Teachers' opinion	Pearson Correlation	-.159	1
	Sig. (2-tailed)	.003	
	N	60	30

Some forms of technology will not necessarily yield comparable results in every educational environment. Technology is not used in isolation for teaching and learning, and the impact of technology on education is largely determined by the educational setting established. To be successful, a teacher attempting to integrate technology into a classroom environment must consider factors such as: administration, teacher, student and parental attitudes towards technology; the educator's teaching style and philosophy; the subject and concepts taught; and the learning styles of the students (Tolmie, 2001).

Next, the study aimed to calculate the extent to which permanent online communication with school can determine pupils' school success. Thus, 40% of the parents consider that an online communication relationship can moderately improve performance in school. The respondent teachers think the same, but with a higher percentage, namely, 46.7%. As a result of the data obtained for this item, the hypothesis according to which there is a positive correlation between school–family communication and the improvement of the pupils' grades is validated. The study further assessed the extent to which the online communication environment really represents a solution for maintaining an effective school–family relationship. Regarding this item, most of the surveyed parents, namely 46.7%, are almost entirely in agreement with the idea that online communication is really a solution to maintaining an effective relationship with the school. The teachers' opinion was not much different from that of the parents, so 40% of them also argued that they are almost entirely in agreement with the fact that online communication is really a solution for maintaining an effective relationship with the parents.

Discussion

Both questionnaires confirmed the fact that the communication relationship between school and families is not a very efficient one, which formed the premise according to which online communication between parents and school could be a solution. In this context, both surveyed samples said that the online environment can be an important and good opportunity both for the school and pupils, namely, for their academic performances.

Even though the same questionnaire was applied to both samples, there were differences of opinion between parents and teachers, the most important of them relating to the item for identifying the most appropriate online communication channels (Ahrens et al., 2015; Olofsson et al., 2015). However, both surveyed groups see the benefits of a school-to-family communication relationship in the online environment, and do not believe that the information transmitted in this way would be different from that transmitted in a direct conversation (Ivan & Duduciuc, 2011).

It is therefore recommended to maintain a communication relationship between school and family in the online environment for any kind of situation. Of course, direct communication is also very important, but in the absence of resources to maintain an effective direct communication relationship, encouraging the promotion of online communication is recommended.

Conclusions

The idea of school–family communication involves a partnership. Thus, the school–family partnership becomes the most accessible and beneficial. All the teachers are in need of important information regarding the pupils' family circumstances, as well as regarding their socio-affective status at home.

An efficient school relates to the pupil, by valuing and respecting his or her identity within the family, recognizing its importance and drawing on it in the teaching process with all the educative resources of the society which it identifies, involves and actively uses. There is also a complex network of relationships within the school, which are important in influencing pupils' education, both positively and negatively (Krumsvik, 2008; Petersson, 2018; Rime, 2007).

Currently, the dimensions of this relationship are more encompassing as a result of the widening of the collaboration concept towards communication through cooperation, and more recently, through the partnership concept

which comprises everyone and expresses a certain positive and democratic approach towards educative relations.

An effective school works in partnership with the student, respecting his or her identity with the family, recognizing its importance and seeking to always draw into the teaching process all the society educational resources which it identifies, involves and even actively uses. There are situations where communication barriers between teachers and parents arise, either from lack of experience or of team spirit or being unable to find the time to collaborate with school.

This paper has shown that the online environment is a very good media for communication and for maintaining an effective relationship between school and family, so this type of communication is encouraged, online communication being not much different to direct communication and which can have many benefits and advantages, from which both parents and teachers can benefit. For the pupils' well-being, it is recommended that such barriers should be removed, either through the parents' or teachers' efforts.

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REFLECTION OF PRESERVICE TEACHER PROFESSIONAL PERFORMANCE FOR PROMOTING TRANSDISCIPLINARY LEARNING IN PRIMARY SCHOOL EDUCATION

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ABSTRACT

The study aims to develop a well-structured and applicable instruction for teacher's self-reflection about their competence to effectuate transdisciplinary learning in primary school settings. Ten preservice teachers were asked to reflect on their transdisciplinary teaching practice in different ways. The content analysis of interviews helped to find out the categories, which provoked the most personally significant, professional and contextual reflections. These categories were structured in the experimental form of teacher's self-reflection for teacher education and further research.

Keywords: transdisciplinary teaching and learning, teachers' professional performance, primary school education, self-reflection, metacognition.

Introduction

Transdisciplinary teaching and learning (TD) is becoming a significant topic/issue in Latvia today in the context of developing a competence-based approach in education. Principles of integrated transdisciplinary learning in primary education and contradictions of description and evaluation of competence in the Latvian educational environment are analysed in the authors' previous articles (Briška, Siliņa-Jasjukeviča, 2016, 2018, 2019). These studies found a dearth of available tools for evaluating the quality of TD and teacher's professional performance relative to it.

The problem is that competence, as with TD, is a complex phenomenon. It is challenging to evaluate it objectively and deeply at the same time, without losing any essential component. It is important for teacher education as well, in that it helps preservice teachers consider their teaching in categories

appropriate to the new curricula. (Self-reflection, as an essential component of a learning process, is a rather new topic in Latvian educational practice. It has become salient in the context of deriving competence-based curricula in general education and teacher education as well.

With the objective of developing and testing a tool for effective reflection and evaluation of preservice teacher's performance, a qualitative investigation was performed. Data were derived through semi-structured interviews. Ten preservice teachers, who are studying TD within their teacher education programme, were asked to reflect upon their TD teaching practice using their own words. The categories, which provoked the most personally significant, professional and contextual reflections of preservice teachers' TD teaching practice, were found through content analysis. These categories were structured in the experimental form for preservice teacher's self-reflection on their TD practice.

Aim of the Study

The **aim** of the study is to develop an instructional tool for teacher's self-reflection within their TD practice. To do so, we sought to delineate the structure, key words, and sample questions that would help them describe and analyse their perceived competency in the organization of primary education TD – in a manner that is deeply held, professionally derived, and critically astute.

Materials and Methods

TD in primary education

The praxis of TD, together with *multidisciplinary* and *interdisciplinary* approaches to teaching and learning, represent three related modes of integrated learning. All employ teaching more than one subject at a time, involve students as active learners, and claim to be more efficient for the learning process than the traditional, disciplinary (i.e., rote) approach. Each develops a different set of relations across the following three dimensions of sociocultural learning:

- Professional: accumulation of knowledge in particular field, solving complex professional tasks, productive, effective, and professional performance.
- Individual: development of learner's mental resources, i.e., individual abilities and skills (including high-level thinking; metacognitive and learning skills), and personal experiences.
- Context: life, world, events, society, culture, values, new situation, resolving the problem, etc. (Kron, 2004; Tiļļa, 2008).

The focus of the multidisciplinary approach is primarily on the various disciplines involved: a teacher organises learning standards for those subjects – generally around a unifying theme. In the interdisciplinary approach to integration – beyond the academic content per se – students learn generic skills pertaining to collaboration, research, writing, communication – and, as well, design and construction. In TD approach, learners create innovative solutions to an actual problem by developing the content and tools of these various disciplines, applying interdisciplinary and disciplinary skills in a real-life context (Drake & Burns, 2004; Helmane & Briška, 2017). Learning becomes organic, meaningful, and transformative, altogether *holistic* as opposed to *mechanical* (Binder, Absenger-Helmli, & Schilling, 2015; Briška, Siliņa-Jasjukeviča, 2016, 2018, 2019; Kaufmann, Moss, & Osborn, 2003; Sterling, 2011). Unlike the other integrated teaching and learning approaches, the main focus in TD is on solving the real life problem; development of student's professional knowledge and individual skills are dependent on, and in a sense, an outgrowth of it (Figure 1).
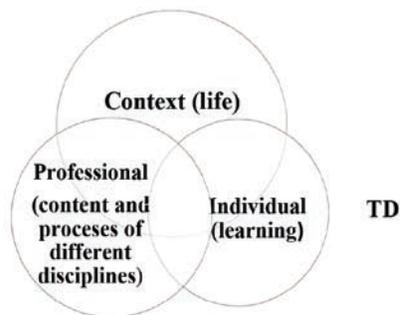
Figure 1. Components of TD

From this, it follows that optimal application of TD includes: (a) the resolution of a life-based question or problem (context of learning); (b) promoting the development of students' basic skills and competencies; and (c) organisation of content of particular disciplines in response to the problem. These components serve as criteria for recognising, reflecting upon, and evaluating preservice teacher's ability to perform TD teaching.

Preservice teacher's self-reflection

There are many examinations and analyses regarding the utility of reflection in professional activity. The findings derived through these research can readily be applied to teachers' professional education. Despite the diversity of views within this literature, all authors agree

that reflection is a meaningful part of professional education. Reflection – together with theory, practice, and experience – is a component of experiential learning (Kolb, 1980; Griffin & Jarvis, 2006). It provides feedback by turning one's back to her/his personal experience and drawing attention to feelings and analysing and re-evaluating them in a range of different contexts (Rogers, 1961; Moore, 2000, 2004; Boud & Falchikov, 2005). Self-reflection is defined as an activity of thinking about one's own feelings and behaviour and the reasons that may lie behind them (Cambridge Dictionary, 2019). Mortari (2015) describes this process as 'a turning back on oneself', where the inquirer – at once – is both the observed and the active observer.

Schön (1987) distinguishes *reflection in action*, *reflection on action* (after action) and *reflection on reflection* (student's metacognition). Haton and Smith suggest three levels of reflection: (a) *descriptive* (student remembers and becomes aware of his/her activities, results, and feelings and presents them in verbal form); (b) dialogic (student analyses particular aspects of her/his performance); and (c) *critical* (student involves him-/herself in reflection about the broad range of contexts touched upon by the subject matter, e.g., historical, social, political, etc., considers/presents contradictions and problems arising therefrom, analysing her/his own reasoning and conceptions, and arrives at conclusions regarding what caused this or that problem) (Haton and Smith 2006). Griffin, Holford, and Jarvis distinguish between *critical* and *holistic* reflection, depending on whether it is rational, i.e., involving a broad context of social and cultural values or – in both contrast with and in addition to these aspects – also appreciates feelings in terms of an individual's personal experience (Griffin, Holford, and Jarvis, 2003). Moon analyses *superficial* vs. *deep and transformative* reflection, assuming that the latter plays an important role in more fulsome, contemplative, and reflective approaches to learning (Moon, 2013), such as represented by Klein, who distinguishes between a *mechanical* vs an *organic* mode of reflection. The first is analytical, linear, logical, and rational, involving deductive reasoning and metacognition; it is implemented frequently in teacher education curricula and evaluation processes with the aim of producing competent teachers (who can analyse and think critically about their professional activities). The alternative, more organic reflection enables teachers to think c*ontemplatively,* i.e., imaginatively about teaching – and, with that, develop discernment, see qualitative nuances inherent in teaching and, overall, be able to understand and navigate the complexities of classroom and school life with greater wisdom and clarity (Klein, 2008).

In various studies on teacher education, evaluations of the importance of descriptive reflection and its desirable content differ greatly. A number

of researchers (e.g., DiPietro & Walker, 2005; Patrick & Pintrich, 2001) propose that critical reflection is the highest level of reflection – alongside the technical evaluation of one's pedagogical performance. Such models, however, pay scant attention to the student's own experience. Hatton and Smith, for example, fail to consider assessment of the students' emotional experience, which appears spontaneously as a part of the 'description of the event' (Hatton and Smith, 2006). In her own analysis, Fenwick contrasts Mezirov's transformative learning approach – which involves identification of students' beliefs underpinning her/his activities, comparing them with her/his experience of reality and 'significant others'' views, and Boud and colleagues' approach, which intends to evaluate the student's experiences together with her degree of involvment in experience and the feelings that experience has caused by (Fenwick, 2003; Boud & Falchikov, 2005).

For the current research, a structure *holistic – analytical – critical* reflection was chosen to promote student's sensitivity, openness, and personal involvement, on the one hand, and professionalism, complexity, contextuality, on the other.
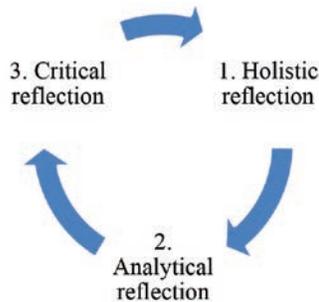
Figure 2. Three levels of reflection

1. **Holistic reflection**: contemplating the process, noticing facts, seeing qualitative nuances, verbalising previously unnamed phenomena, articulating what was done, and what has happened in the process of action. The holistic approach to reflection is grounded in the belief that teachers are whole persons and teaching is multidimensional, including personal, ethical, spiritual, aesthetic aspects and complex and nuanced activity (Erlandson, & Beach, 2008):

    Criteria: openness, authenticity, sensitivity of perception (Rogers, 1961; Bandura, 1997; Klein, 2008).

2. **Analytical reflection:** analytic, linear, logical, rational thinking, deductive reasoning, interpreting facts by identifying regularities and analysing them in a professional context.

Criteria: the use of professional terminology, theoretical justification, the ability to analyse situations.

3. **Critical reflection**: evaluating the activities and learning in wider social and cultural contexts, and in relation to metacognition and justification of the situation and decision-making, according to different points of view. There is a relationship between critical reflection and transformative learning that can impact upon individual self-efficacy beliefs and agency. Agency occurs across social structures and cultures and can be linked with social cognitive theory (Pantić, 2015). Critical reflection can enable person to engage with dilemmas and to affirm or identify their values and what is meaningful in their practice (Gardner, 2009).

Criteria: diversity of points of view, awareness of individual, social and cultural values and one's responsibility to them.

Thus, in the instructions for reflection, each dimension of TD (context, subject content, development of individuality) must be reflected across three levels (Figure 2).

Research design

In order to develop a tool for effective reflection and evaluation of preservice teacher's TD performance, qualitative research was performed. The study sample consisted of 10 randomly chosen preservice teachers, who study TD in their professional study programme and who agreed to be involved in the research. Data were collected in narrative interviews. Respondents were asked to reflect on their TD teaching practice immediately after having taught a class as part of their study practice. As specific questions were not offered, respondents had to choose the words, i.e., how to verbalize their experiences, activities and learning. Unstructured interviews served as a good opportunity for researchers to discover new ideas and unexpected points of view (Mayring, 2014).

Following this phase, content analysis of the interviews was performed. Units of meaning were marked, coded, generalised into meta-codes, and related to categories of TD. Typical major words, phrases, and expressions were collected in order to delineate holistic, analytical, and critical ways of reflecting on student teachers' TD practice. On the basis of these findings, an instruction for teachers' self-reflection on TD practice was developed (with a structure and set of sample questions designed to elicit personally significant and contextually-based reflection).

Results

The data analysis revealed several patterns of teachers' self-reflection. The first expressions of respondents were emotional and spontaneous: '*The garden party at the end of school year was sincere, fun, attractive, unforgettable'. I was in doubt when I chose this unusual topic for learning'*. The naming of dominant feelings during practice, an emotional evaluation of the process in whole, can be evaluated as an index of holistic self-reflection. The first level of reflection expresses preservice teacher's perceptions, i.e., feelings, emotions, and expectations, and lets them identify the elements of teaching and learning in general. This finding fits with Klein's (2008) idea about describing/showing/naming, aspects of teachers' inner life in her/his professional practice by using such words as *bravery/courage, empathy, joy, hope, forgiveness, fortitude, generosity, imagination, inspiration, integrity, justice, kindness, love, mastery*. These qualities are not typically appreciated in teacher education and mostly are not included in teachers' professional standards; still, they are personally meaningful for students' experiences or easily recognizable in practice.

Below, respondents' narratives follow a range of different paths. They look for causes; make judgments about the consequences of choices they made; and analyse the learning process in context of the chosen life problem, i.e., the learner's involvement, their personality, and development and content of integrated disciplines: '*they did multiple actions for calculating the amount of refreshments (math), to use polite speech phrases in the invitation (mother tongue), to blend ice cream cocktail (home economy)'*, '*the time for working in groups was too short'*. The second level of reflection displayed students' professional knowledge and analytical skills by categorization, comparison, logic reasoning and implementation of professional terminology.

Another level of reflection of reflection revealed her/his personal significance, meaning, *values: 'Children's skills of planning, cooking, singing, etc., were so useful there…, 'my students calculated their own ecological footprint using math methods'*. According to Cotter, critical reflection is challenging, but intrinsically offers a reflexive space for honesty, self-critique, and new beginnings (Cotter, 2014). Life and cultural contexts appear in the teaching and learning process always with the phrase '*because of…'*. In this self-reflective stage, respondents articulated fundamental values that affirmed the meaning of their professional performance in the life context.

Respondents' expressions, typical words, phrases and samples of questions were structured in accordance with three dimensions of TD learning and three levels of reflection (Table 1).

Table 1. Preservice teachers' self-reflection about TD

Levels of reflection	Typical words and phrases	Appearance of TD in preservice teachers' expressions	Samples of questions
Holistic reflection	*I did..,* *I felt…,* *I chose…,* *I decide…,* *It happens…,* *It appears…etc.*	**Context –** *events, situations, problems in life - classroom, community, nature etc.;* **individual –** *students' activities, behaviour, mimic, body language, expressions, intonations etc.;* **professional –** *I use methods; I expect it was so…*	*What did you see?* *What did you feel about?* *What did happen?* *What did you decide to do?* *What did you choose?*
Analytical reflection	*I did it because of…, My activity results…, The reason was…,* *The less…, the better…,* *If teacher does…, child learn…,* *Next time I will/ will not do it… etc.*	**Context –** *content of different subjects and students' individual skills help to solve problem etc.;* **individual –** *this method promotes students' learning, cognition, thinking, creativity, social skills etc.;* **professional –** *knowledge and processes of one field completed each other…etc.*	*How do you solve the problem?* *How do you promote students' learning, cognition, thinking, creativity, social skills etc.?* *How does content of one field help/ complete to learn another?*
Critical reflection	*It was important for me…,* *I chose it… because of,* *It was significant, meaningful, valuable for…,* *The contradiction is…etc.*	**Context –** *it is (problem solution) significant for each of us, for community etc.;* **individual –** *it is personally, socially and culturally important for student's learning etc. because of…;* **professional –** *importance of knowledge and skills of particular field for life - person, society, culture and world etc.*	*What is a value of problem solution for each of you for community?* *Why this topic/ problem/ activity was actual for students?* *Why do you choose …?* *What is importance of knowledge and skills of particular discipline for life - person, society, culture and world?*

These results suggest that preservice teachers' deep and constructive self-reflection on their transdisciplinary teaching performance can be realized if questions suggested for reflection cover all dimensions of TD and three levels of reflection. In total, there are nine, or 3 x 3, types of questions (Figure 3).
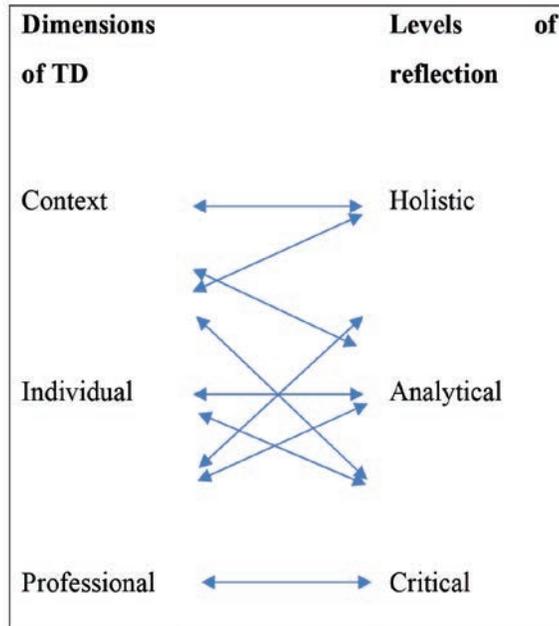
Figure 3. Nine types of questions for preservice teachers' reflection on TD

Multidimensional, multilevel reflection entails 3 x 3 questions. These nine questions, altogether, comprise 'Form - 3 x 3 questions for TD self-reflection', as will be developed and tested in future studies.

Conclusions

In optimal guidelines for preservice teachers' self-reflection on TD, the structure of TD (context and individual professional dimensions) should be included. This forms the content of self-reflection. On the other hand, three levels of reflection: holistic, analytical, and critical, enabled the development of instructions for self-reflection that were deeply held and personally significant.

In the teacher's reflection on her/his professional performance, the aesthetic point of view must be taken into account, in addition to the analytical and critical standpoint.

If one of dimension of TD is not presented in teacher self-reflection, we cannot be sure that TD has been realised completely.

If one of the reflection levels is missing, preservice teacher's competency may be questioned.

The questions can be stated differently, but 3×3 question structure should be kept.

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ARTISTIC COGNITION IN SECONDARY SCHOOL LITERATURE LESSONS

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ABSTRACT

The subject of Literature studies is connected with the specifics of literature as the art of words and the cognitive abilities of the particular age group. It is crucial that the cognitive process during Literature lessons has a personal significance for the pupils, therefore the teacher should engage in artistic cognition together with the pupils, taking up activities that aim to develop creativity and co-creation. Creative tasks in Literature lessons not only develop logic, rationality and analytical skills; creative tasks help to involve pupils in imaginative, emotional and reflective processes. Such activities cultivate critical thinking and associative skills, stimulate imagination and encourage self-discovery and self-expression. Concepts, opinions and conclusions are not the only cognitive forms – there are images (creative mental models) and thought experiments as well. Therefore, the process of studies can be both reproductive and productive; problem solution, analysis and synthesis using literary fiction and, interdisciplinary, other arts, is at the very heart of artistic cognition process as applied to Literature studies. Solution of unconventional tasks posed by fiction studies requires not only critical thinking, but also creativity and creation of new values. During Literature lessons, the teacher encourages the pupils to engage in artistic cognition correspondent to the needs and abilities of their age group, taking into account the importance of stimulating pupils' aesthetic needs in a value-oriented learning process, development of pupils' artistic perception and creative thinking, reproductive and productive imagination, cultivation of artistic empathy and compassion, development of artistic analysis skills, collaboration, encouragement of self-discovery and self-expression.

Keywords: creativity, empathy, imagination, Literature studies, artistic cognition, self-expression.

Introduction

Pedagogical requirements to the quality of the study process have always been high and evolving in attempt to discover, explore, facilitate the development of harmonic, comprehensively developed biopsychosocial personality. In the tense setting of the competence-based education reforms in the 21ˢᵗ century, discussion on the role of artistic pedagogy, the cultural understanding of pupils, the self-expression in arts and the role of Literature subject in the learning process involves pedagogues, parents,

pupils, and representatives of various professions. The role of art and culture in today's world has changed radically. We live in a time where every member of society is simultaneously both consumer and creator of culture. Technological development imposes a need to be creative. At the same time, the world we live in is becoming increasingly complex, we have ever fewer answers, and contemporary art is one of the ways we try to explore and understand our place in the world. Art is an important form of expression of creative freedom.

In the 21st century there is a peculiar tendency that, on the one hand, populistic slogans like "The world continues to change dramatically, but education does not adapt quickly enough!" or "Pupils are not prepared to deal with the challenges of the modern world!" are gaining popularity. On the other hand, many classical pedagogical conclusions are in a kind of renaissance, as evidenced by discussions and polemics in both scientific journals and mass media. Even OECD researchers emphasize the importance of creativity and creation in reference to what Albert Einstein has said: "Imagination is more important than knowledge. For knowledge is limited to all we now know and understand, while imagination embraces the entire world, and all there ever will be to know and understand" (Fadel, et al, 2015).

In some countries, teaching of art and design is included in general education as an important part of the training in science, technology, engineering, and mathematics (STEAM), i.e. practicing symbiosis of arts and these fields. Since art is an important resource for the development of intelligence and thought, it should not be taught by teachers by means of complementing positions according to the following principle: if a certain teacher needs more work load, a teacher of geography, natural sciences or other subjects, after doing some additional training, can become, for example, a teacher of visual arts (Bunkše, 2017). This idea can be supplemented by the realization that even a teacher of Literature should have a high qualification because in order to understand and analyse literary fiction or to assess the artistic creativity of pupils the teacher needs in-depth knowledge of literary and other arts, a pedagogue's qualification and experience, and knowledge of the psychological processes of making a work of art, as well as the specific development features of the particular age group of the pupils. Latvian Doctor of Pedagogy Anita Skalberga (2012) emphasizes the important role of Literature teachers, since literature is the facilitator of personality development, understanding of the world, aesthetic values and emotional intelligence, thus promoting engagement in culture.

The Literature study process is related to the specific nature of literature as cognition of the art of words and to the ability of artistic cognition of

pupils at a given age. In Literature lessons it is essential that the cognitive activity becomes a personally important process for the pupil, so it would be advisable for the teacher to organize cooperation in pedagogically artistic activity and to engage pupils in artistically orientated cognitive activities aimed at creating, co-creating and development of a new subjectively and socially meaningful self-experience.

The paper follows the cultural-historical approach, the operational and systemic approach, and the following methods are used: theoretical analysis of pedagogical literature and discovering interrelations, analysis of self-experience.

Literature as a study subject of the art of words

Art as a part of intellectual culture includes the main areas of artistic activity, i.e. fine arts and music, literary fiction and dramatic arts, etc., but in the broader sense art or artistry is associated with many areas of human life and activity. In Literature studies, it is important to observe the specific nature of literature as art of words, where "work of literary fiction is a special figuratively conditional text, its comprehension in its perception is closely related to feeling, imagination, associations" (Rudzītis, 2000).

Jānis Anspaks (2006) acknowledges that the fundaments of art pedagogy are reinforced by the notion that personality formation should be viewed as a whole, capturing in conjunction the emotional and the rational spheres, and he emphasizes that the native language and literature lay the foundations for children's artistic upbringing; therefore it is important to abandon the over-rationalisation of the Literature teaching process, focusing mainly on cultivation of imagination and feelings instead. One of the responsibilities of teachers of native language and literature is to reveal the magic of the mother tongue, to deliver aesthetic pleasure and satisfaction of problem solving to pupils through literary fiction. Art subjects open up opportunities to expand pupils' artistic horizons, as well as cause deep aesthetic experience and pleasure. "Fetishizing the scientific path in cognitive process and personality development, neglects emotional education, artistic education, and in-depth acquisition of intellectual and aesthetic values." (Anspaks, 2006, 96).

Ausma Špona (2006) recognizes that the effect of art and literary fiction on person occur with every element of it — word, sound, rhythm, colour, line, shape. "The artistic cognition allows pupils to explore themselves in a creative activity, to comment of what they have seen and experienced in themselves (Špona, 2006, 116). The young person learns to understand things and phenomena only when these are personally important to them.

It is essential that for the pupil the achievement of the learning goal is interesting, that the pupil experiences feelings and emotions, that learning gives them satisfaction, that studies are enjoyed as a process of personality fulfilment and improvement of the self (Maslo, 2003).

Each generation perceives a text in its own way, therefore one should not think of any "absolutely correct" reading or determining anything unambiguous in the Literature study process. Understanding the meaning of literary works is also subject to dynamism, it develops and evolves. The more successful the teacher is in helping each pupil's reader experience, the more they will be able to understand the literary work (Skalberga, 2012). With the understanding of the text, the pupil also reveals his attitude to the world, because the emotional sphere plays a major role in human life and thought. "The subject of literature is not a course in literature theory and literature history. It consists mainly of literary fiction as works of art of words, and of the associated artistic potential. If ignored, Literature in school becomes a general education subject and does not retain the specific features of the art of words. It preserves educational opportunities, but loses the opportunities of artistic upbringing orientation of values" (Rudzītis, 2000, 52).

Despite the fact that the importance of Literature lessons in Secondary School is still under discussion in Latvia, Literature studies are now particularly topical there because:

1) nowadays the perception of texts has become more complicated in terms of content, form and emotional contradiction;
2) greater activity and stronger imagination are expected from the reader of modern literature;
3) for the text comprehension by a reader, not only the outside world experience is essential, but also their own inner world experience (including their wishes, fears, fantasies), which should also be developed and used;
4) in the lessons of Literature, the formation of the world view of pupils is promoted and the pupil as a reader is being prepared to creatively use acquired knowledge and skills in their future lives; the competence of the pupil as a reader is expanded;
5) when reporting on what has been read, the pupil expresses their attitude towards the world;
6) Artistic cognition in Literature lessons promotes the pupil's general competence to work with abstractions, such as ideas, symbols, images (National Centre for Education).

In his studies and recommendations on the Literature teaching methodology, Jānis Rudzītis (2000, 111) emphasizes the need for the development of the professional competence of Literature teachers, because

the Literature teacher needs a well-developed pedagogical thinking and pedagogically artistic thinking strategy in order to be able to encourage and develop the following in pupils:

- aesthetic needs;
- artistic perception (artistic associations related to it, co-creation, artistic emotional experience, artistic analysis);
- artistic contact, also self-exploration (formation of value orientation);
- catharsis as a self-decontamination of complex feelings in empathy;
- artistic appreciation of the facets of the beautiful and the good.

Interaction with art, including literature as art, is to be developed, cultivated. Lev Vygotsky (1965) emphasizes that the effect of art is not "mechanical", but rather reinforced by the active participation of the personality itself. Otherwise, the intellectual aspect of art is lost. Furthermore, Jānis Anspaks (2006) says by a scientific metaphor: "It is complicated to unleash in oneself the highest manifestations of aesthetic activity, i.e. the ability to very consciously protect, nurture and create beauty, to determine one's way to aesthetic self-upbringing, self-education and self-development, using the possibilities of exploration of the beautiful and the true where the word as an indispensable means of cognition, activity, interaction and creation is of a great importance. It is with a word that the cognitive exploration path begins and ceaselessly continues to grow, by discovering the uncharted, the unfelt, the unprecedented. The aesthetic, the beautiful, the artistic gives this miraculous power to a word" (Anspaks, 2006, 91).

The former Latvian Minister of Culture from 2013 till 2019 Dace Melbārde in an interview at a Latvian Television show on culture said: "I believe that the role of education is not only to develop each individual's personality, but also to preserve the national values, to enrich them. All the values that make Latvia – the Latvia. In general, the country's development is dominated by exact issues, economic development, which is, of course, understandable and reasonable, but the basis of any development, whether it is state development or personal development, there must be harmony, balance, for economic development is worth nothing if it does not make us to be cultural people, for example, or does not lead to cultural enrichment. Education should produce both intelligent and creative people. People who respect their cultural values and who are able to pass them on to future generations" (Verhoustinska & Kaminska, 2018).

Learning is a lifelong process, both at school and outside of it, at work and at leisure time. Learning is individual but also social and cultural. Learning is also a cognitive process in which the social and cultural dimensions play important roles. This is important in all areas of learning, especially in areas related to language learning types, as linguistic communication is

a social and cultural process. Only the combination of the emotional and the rational makes learning to be important (Maslo, 2003). A pupil from the last year of Secondary School, thinking of the importance of Literature studies, writes: "With the help of literature people get an idea of the world, other people, relationships, but most importantly –their inner world, their pains, doubts and experiences, about values acquired and sometimes lost." (Inga [Name changed], 12th grade).

There is no common understanding of pedagogy, education science, pedagogical psychology, art, or of the essence of culture in the world. Also, the teaching methodology is not based on any one universally productive learning model, but it drives the thinking of teachers so that, in accordance with their professional competence, they seek and find optimal ways of their cooperation with their pupils (Rudzītis, 2000, 46). Creativity in the learning process is tied with collaboration and interdisciplinarity, where understanding the meaning of the text, imagination, seeing the actual issue, ability to learn independently, using reasoning skills in writing, and being open to new experiences that drive pupils towards subjective search for meaning are all essential. The creative Literary tasks are not only related to logical, rational, analytical activity, for creative tasks help pupils to get involved in artistic-oriented cognitive activity that promotes problem-thinking, evokes associations, emotions, develops imagination, and is oriented towards awareness of values important to themselves and society, and towards self-discovery and self-expression in action. Therefore, the authors of the Latvian "School 2030" educational reform, who were seeking cross-disciplinary complementation of the Literature and Sport, and Literature and Physics subjects, could be advised to do it on pedagogically sound basis, by assessing the experience of our national pedagogy in the Literature teaching methodology, by giving the literature teaching process an important role in the realm of cultural awareness and taking into account the specific and different nature of the artistic knowledge process of the Literature studies from the process of intellectual cognition in subjects, such as Science, for example. One of the tasks of the Literature teacher is to develop self-activity and self-expression of pupils in an artistically directed cognitive action.

Artistic cognition in Secondary School Literature lessons

If the focus of the learning process is not on the content and the outcome of learning, but rather on the individuality of the pupil's personality and on cooperation, then the essence of the educational process is related to the approach of personality activity, where cognitive activity is the basis of the learning process. Jean Piaget also reminds the importance of a learning

process oriented towards the pupil's internal and individual activity, where "the child always learns actively by interacting with their environment, creating ever more complex thought structures" (2002).

Learning is one of the most complex human activities, the outcome of which depends not only on the ability to learn and on attitudes towards it, but also on the mental abilities altogether, on the attitudes and assistance of others, on the adequacy of teaching aids. Thus, learning is not just an activity of the mind, it is strongly influenced by non-intellectual processes, such as emotions, motives, interests (Žogla, 2001, 220).

Cognition is traditionally explained as a process of human creative activity, inseparably linked to the social and historic experience which is a- reflection of objective reality in human consciousness. In the process of cognition, a person acquires new knowledge of the world on the basis of which the aims and motives of human activity arise. The basis of cognition is practical experience. Cognition as a socially conditioned cultural and historical process cannot exist or develop beyond interaction and activity.

In art pedagogy, the understanding of interplay between scientific and artistic cognition is essential in the process of forming a comprehensive personality. Jānis Anspaks (2006) points out that several types of cognition can be distinguished: the everyday, the artistic, and the scientific, in which the word has a leading role. Bringing the benchmark of scientific reference to the forefront and leaving non-scientific cognition possibilities in the "shadow" lead to one-sidedness in the learning process. The revelation of the scientific and artistic cognition features and the defining of their interaction in the personality development during a learning process is very topical in art pedagogy, not forgetting that education is not just a rounded amount of knowledge, but one is encouraged to ensure a harmonious and balanced development. This also fully applies to the choice of cognition styles and the specialization of the child (adolescent, youth, adult) in relevant cognition activities. "It is important to emphasize the most essential difference between art and other forms of world cognition. If science captures the world scene in concepts, theories, abstract categories, then art expresses the world in images. Therefore, the (beautiful) perception and understanding of art begins with the specific means of figurative thinking and with their perception. A character is a technique of inquisitive reproduction and generalization of the beautiful from the position of aesthetic ideal, thus reflecting the world in a distinctly perceptible, directly perceived form." (Anspaks, 2006). Figurative thinking is needed in all forms of cognition, it is not only related to the field of art; the cognition process is unified; however, the learning of each field is characterized by a different choice of pedagogical means in the teaching and upbringing process.

Irēna Žogla (2001) also emphasizes in her studies that by understanding the essence of studies, three types of cognition have to be compared: Practical cognition, Scientific cognition and Learning cognition. Practical cognition is learning by doing, it is always concrete and unique, repetition is based on the knowledge and skills already acquired. Scientific cognition is a very targeted way of cognition, intense discovery of objectively new relations, rules. The foundation for the discovery of the new is Learning cognition. A Learning cognition is a specially, purposefully organized, intense cognition method that takes place with the help of a teacher and purposefully prepared teaching aids, it is the discovery of the subjectively new (Žogla, 2001, 223). All types of cognition are united by the aim of discovering the essence of things and phenomena, internal rules, interrelation of structural components for practical use of this knowledge or for acquiring new knowledge.

In turn, Ausma Špona (2006) adds that Learning cognition is acquisition of subjectively new knowledge, skills and attitudes within a specially organized pedagogical process where new, subjectively and socially significant self-experience arises. She points out that a learning cognition can also be seen as an artistic cognition, since the cognition is generally an intellectual process, where perception also takes place through the senses, feelings, characters, concepts. The artistic cognition allows the pupils to explore themselves in creative activity, to express their appreciation of the seen and experienced. The artistic cognition encourages both attitude and intellectual development by perceiving, analysing and understanding a work of art in a personally significant emotional experience. It forms a habit of viewing, listening, acting creatively, analysing and emotionally perceiving a work of art, of contemplating traditional and art values. It is important to cultivate in pupils a need for art values, that is a skill to evaluate; to perceive a work of art; to create art values, which are components of educational content that ensure the formation of positive attitudes towards art (Špona, 2006).

The logical path of cognition (perception, imagined character, realization, application) is peculiar in the study process, for learning is not only an activity of the mind, it is also strongly influenced by emotional processes, such as emotions, motives, interests. Based on pupils' experience and abstract thinking, it is possible to achieve intensity in action. The learning process depends on what aspect of cognition is chosen as its basis. The essence of learning is that a theoretical or practical learning task can be solved only within the realistic possibilities of the pupil, respectively – based on the developed learning skills, knowledge of a particular subject or subject group, the quality of the development of cognition processes and attitude towards it (Žogla, 2001, 227). Doctor of Art Aija Freimane in

an interview on the role of artistic cognition in education acknowledges that "Today the ability to perceive and notice, the ability to watch and reproduce is an important part of interdisciplinary education, innovation and collaboration between different professionals" (Bunkše, 2017).

At Secondary School, within the age group of 15 to 18-year olds), needs and cognitive development are associated with a new environment and requirements, as well as the young person's progress towards their profession, resulting in a need for certain behavioural, emotional and value autonomy. Autonomy of values means that in early youth there is a need and a right to having their own opinions, even if these views are still in formation, and often very categorical (Šteinberga, 2013). The Literature learning process offers great philosophical issues of life and a path to forming, formulating and defending oneself and one's opinions through literary fiction as an individual cognition action, as well as in cooperation, and encourages the aesthetic needs of pupils in value-oriented learning process. Vilnis Purēns draws attention to the importance of inquisitive interest during the learning process and concludes that "In adolescence, inquisitive interests are characterized by operation with abstract phenomena, experiments with selection of interest object, domination of self-affirmation needs, need for awareness of ones' independence, emphasis on the importance of outcome and social evaluation, orientation of interests towards humanitarian fields (Purēns, 2017).

Another pupil of the last Secondary School year in their consideration of "My Searches and Discoveries in Literature," emphasizes what is important for him in fiction, Literature lessons, and the cultural space as a whole: "I expect and seek an opportunity to manifest myself in the cultural environment. It brings new experiences and perspectives; from it I have acquired both academic knowledge and life knowledge. I am looking for something more in culture and literature than just what can be useful for an essay in a Literature lesson, but also for what develops my mind and makes my personality more intelligent. In the end, I am simply looking for how to spend time meaningfully and develop myself. I have attended poetry readings, classical and alternative cinema and theatre performances, music concerts, art exhibitions. I am genuinely interested in the creative part of humanity." (Gundars [Name changed], 12th grade).

Quality learning in Literature classes takes place if each pupil can develop their abilities and talents, find a way of learning appropriate to their learning skills and traits, the needs of the pupils are taken into account in the learning process, and the teacher is a consultant, assistant, but the pupil is independent and mainly responsible for their own learning. The Literature learning process is not confined to logical, rational, analytical action, since pupils are involved in an imaginatively emotional, evaluative

artistic cognition that promotes problem solving, encourages associations, develops imagination, directed to self-discovery and self-expression in action. Latvian painter Džemma Skulme, upon receiving the Purvītis Prize for a lifetime contribution to art, said: "The mission of art is to expand fantasy and thought and to put the soul area in action" (Kušķe & Latvian Public Broadcasting, 2019).

Conclusions

The Literature study process develops pupils' artistic perception and imaginative thinking, pupils' imagination, encourages artistic empathy, empathic experience, develops artistic analysis skills, critical thinking, co-operation, promoting creativity, self-exploration and self-expression, and fostering national identity awareness in the global cultural space.

The artistic cognition of Literature study process is aimed at both acquiring new knowledge and skills and at promoting creativity and creation in pupils. Creativity in the Literature lessons as an art subject can take different forms: as creativity and artistic creation, as well as critical thinking and creative problem solving.

Forms of thought are not only concepts, judgments, conclusions, but also images (imaginary models) and thought experiments. Thus, learning activity can be both reproductive and creative, and it is the artistically orientated cognition process where the focus is on the Literature learning process dealing with problems, analysis and synthesis using fiction and other arts through interdisciplinary principle.

Jānis Anspaks (2006) and Jānis Rudzītis (2000) have made a major contribution to Latvian artistic cognition research and Latvian art pedagogy, including literature as the basis of art of words, emphasizing the importance of the Literature teacher's professional competence and reminding that it is essential in Literature learning process to recognize the specific features of literature as an art of words where artistic cognition allows pupils to explore themselves in creative, personally meaningful activity, discovering and expressing their attitude towards the world, developing and cultivating their intellect.

Literature teacher in Literature lessons encourages pupils to engage in artistically oriented cognition activity that is appropriate to pupils' development needs and abilities, where it is important to encourage pupils' aesthetic needs in value-oriented learning process, to develop pupils' artistic perception and imaginative thinking, imagination, to encourage artistic empathy and empathic experience, to develop artistic analysis skills, co-operation, to promote pupils' self-exploration and self-expression.

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WHAT DO TEACHERS DO TO PROMOTE STUDENTS' READING LITERACY AT 4ᵀᴴ GRADE? – EVIDENCE FROM IEA PIRLS 2016 STUDY

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ABSTRACT

Reading skills which a child learns from an early age are crucial for student's success or failure in subsequent school years as literacy is closely related to all other school subjects. Learning to read and promotion of reading plays an important role in the development of the personality and attitudes of the child.

Teacher is the one responsible for applied techniques of teaching and learning to read, and methods that are used purposefully lead students to the understanding of a text. It is of great importance for teacher to have a wide arsenal of diverse educational methods and experiences. Primary teachers should have a broad theoretical knowledge base and also be able to teach different reading strategies to help students to reach their full potential as readers. An important factor in developing attitudes towards reading is the ability of reading literacy teachers to get their students to become interested in both – literary works as a source of information and joy, and reading as an activity in general.

The aim of the study is to find out what activities the primary school teachers in Latvia apply to promote their students' reading literacy and how those methods relate to students' achievements in reading. In the study a statistical group comparison is performed using IEA PIRLS 2016 data from teacher questionnaires along with information about student achievement.

Key words: PIRLS, Reading literacy, Reading teachers, Teaching methods, 4ᵗʰ grade.

Introduction

Teachers play a major role in development of students' reading skills and habits (Jose, Raja, 2011). Subsequently reading literacy is a foundation of a further academic success (Delgadová, 2015). To promote students'

reading skills teachers use a large variety of different methods some of them being more effective than others (Allington, Johnston, 2000).

Similarly to other large scale education assessments the IEA (International Association for the Evaluation of Educational Achievement) PIRLS (Progress in International Reading Literacy Study) study also collects information about teachers work patterns in class. Those patterns and methods can be analyzed along with the data about students reading achievement to see how application of different approaches is linked to achievement scores of 4th graders in PIRLS test.

Aim of the Study

The aim of the study is to find out what activities the primary school teachers in Latvia apply to promote their students' reading literacy and how those methods relate to students' achievements in reading.

The research question is: What teaching strategies relate to higher 4th grade students' achievement in PIRLS 2016 reading literacy assessment?

Methodology

For the analysis Latvian data from PIRLS 2016 were used. PIRLS is a reading literacy study targeting young students in their fourth year of schooling and being conducted internationally every five years (Mullis, Martin, 2015).

PIRLS not only assesses students' reading literacy, but also employs surveys of students, their parents, teachers and school principals to collect a valuable information about the context factors. These surveys provide the data which permits linking student assessment results to certain background characteristics and drawing conclusions about the influence of the surrounding environment on the results. In Latvia around 4000 students, their parents and teachers, as well as school principals from both Latvian language instruction and Russian language instruction schools participated in PIRLS 2016 study.

The centerpoint of PIRLS achievement scale is set constant at 500 points and represents the mean of the overall achievement distribution in the first cycle of the study at 2001 (National Center for Education Statistics, n.d.). The standard deviation of the PIRLS scale is 100, and the scale is kept constant in each administration of the study.

For this study the data from PIRLS 2016 teacher questionnaire were used along with students' reading achievement scores from the test. The analysis of the data was performed using the statistical software IBM SPSS 22 and

IEA IDB Analyzer. Descriptive statistics (frequency, means, standard errors and percentages) and significance tests were performed.

Results

For the sake of answering the research question in this study the data from two questions from PIRLS 2016 teacher questionnaire were analyzed.

The first question of interest was: How often do you do the following in teaching reading to this class? The list of methods included in the question is provided in the 1st column of Table 1. Teachers could pick a frequency of application for each method from options:

- Every or almost every lesson,
- About half the lessons,
- Some lessons,
- Never.

For analytical purposes authors grouped teachers' answers in following two groups of comparison:

1. Every or almost every lesson,
2. Less frequently than almost every lesson.

Table 1 shows percentages of students whose teachers answered accordingly and average scale scores in PIRLS test for each group of students. The last column in Table 1 indicates if the difference in achievement scores between the groups is statistically significant. For example, 28 percent of students have teachers who provide materials that are appropriate for the reading levels of individual students at every or almost every lesson, and reading achievement level of this group or students is significantly higher than the average achievement of students whose teachers use this individual approach less often.

The opposite relation can be noticed for providing an individual feedback for each student. Students whose teachers give individual feedback less often have higher test results. But one must be cautious with the cause-effect interpretation here. Most likely these results of the analysis indicated that lower performing students are needier for the individual feedback and therefore are given it more frequently.

Teachers' frequently linking new content to students' prior knowledge and encouraging students to develop their understandings of the text are associated with higher student reading achievement. It can be acknowledged as positive fact that about 80 percent of 4th grade students in Latvia experience this very often.

Table 1. Comparison of frequency of usage of different teaching methods with the average reading achievement scores

	Every or almost every lesson		Less frequently than every lesson		Difference statistically significant
	Percent of students	Average scale score (s.e.)	Percent of students	Average scale score (s.e.)	
Provide reading materials that match the students' interests	49	560 (2,9)	51	556 (2,7)	No
Provide materials that are appropriate for the reading levels of individual students	28	563 (3,1)	72	555 (2,2)	Yes
Link new content to students' prior knowledge	78	561 (2,0)	22	546 (4,0)	Yes
Encourage students to develop their understandings of the text	84	560 (1,9)	16	545 (4,4)	Yes
Encourage student discussions of texts	84	559 (2,0)	16	550 (5,0)	No
Encourage students to challenge the opinion expressed in the text	26	562 (3,6)	74	556 (2,2)	No
Use multiple perspectives (among students and texts) to enrich understanding	42	562 (3,0)	58	554 (3,0)	No
Give students time to read books of their own choosing	16	554 (5,1)	84	559 (1,8)	No
Provide an individual feedback for each student	36	553 (3,0)	64	561 (2,0)	Yes

The second question from the PIRLS teacher questionnaire of focus for this study was: How often do you ask the students to do the following things to help develop reading comprehension skills or strategies? The list of skills and strategies included in the question is provided in the 1st column of Table 2. Teachers could choose an answer from the following list of frequencies:

- Every or almost every day,
- Once or twice a week,
- Once or twice a month,
- Never or almost never.

And as previously authors of this paper have grouped teachers' answers in following two groups of comparison:

1. Every or almost every day,
2. Less often than every day.

Three indications from Table 2 are most noteworthy – only about 20 percent of students are frequently asked to compare what they have read with other things they have read, make predictions about what will happen next in the text they are reading and determine the author's perspective or intention in the text. Those 4th grade students whose teachers often ask them to practice the approaches mentioned above show significantly higher results in reading literacy. The results show that application of these methods should be encouraged in primary grades in Latvia.

Table 2. Comparison of frequency of promotion of different reading skills and strategies with the average reading achievement scores

	Every or almost every day		Less often than every day		Difference statistically significant
	Percent of students	Average scale score (s.e.)	Percent of students	Average scale score (s.e.)	
Locate information within the text	80	560 (1,9)	20	550 (3,8)	Yes
Identify the main ideas of what they have read	71	559 (2,1)	29	555 (3,7)	No
Explain or support their understanding of what they have read	65	562 (2,1)	35	550 (3,0)	Yes
Compare what they have read with experiences they have had	50	561 (2,7)	50	554 (2,5)	No
Compare what they have read with other things they have read	20	569 (4,0)	80	555 (2,0)	Yes
Make predictions about what will happen next in the text they are reading	22	566 (4,2)	78	556 (2,0)	Yes
Make generalizations and draw inferences based on what they have read	59	559 (2,6)	41	556 (3,2)	No
Describe the style or structure of the text they have read	10	566 (5,9)	90	557 (1,8)	No
Determine the author's perspective or intention	21	566 (4,5)	79	556 (1,9)	Yes

There has been a lot of research in the field devoted to finding the most optimal class size (e.g., De Paola et al., 2013; Hoxby, 2000; Bonesrønning, 2003) and providing various results. In this study the authors analyzed how is the class size linked to teachers' application of different methods of teaching reading. Table 3 shows what percentage of students in each of three categories of class size experience certain teaching approaches every or almost every lesson. For example, providing materials that are appropriate for the reading levels of individual students is more often practiced in small classrooms – approximately 45 percent of students who are studying in a class with no more than 12 classmates experience this method from their reading teacher every or almost every lesson. Comparatively in classes of more that 24 children only 21 percent of students receive individually targeted reading materials almost every lesson. Since according to previously mentioned results of the study this method is related to higher average reading achievement of 4th graders (as shown in Table 1) in this case large class size is not an advantage.

Table 3. Use of different teaching methods depending on class size

Every or almost every lesson	Percent of students		
	Class size up to 12 students	Class size from 13 to 24 students	Class size bigger than 24 students
Provide reading materials that match the students' interests	47,9%	56,9%	41,4%
Provide materials that are appropriate for the reading levels of individual students	44,5%	29,8%	21,4%
Link new content to students' prior knowledge	68,3%	74,6%	83,5%
Encourage students to develop their understandings of the text	80,8%	82,6%	87,6%
Encourage student discussions of texts	89,5%	82,0%	83,3%
Encourage students to challenge the opinion expressed in the text	25,9%	18,6%	33,6%
Use multiple perspectives (among students and texts) to enrich understanding	47,9%	35,0%	47,8%
Give students time to read books of their own choosing	9,6%	20,3%	12,7%
Provide an individual feedback for each student	53,4%	43,6%	21,7%

Results of similar analysis are presented in Table 4. It can be noticed that fewer students form small classes are frequently asked to make predictions about what will happen next in the text they are reading than

their counterparts from large groups. A recommendation can be drawn that teachers who work with small number of students should use this approach of promoting reading literacy development more often since it has showed a positive relationship with achievement level as shown in Table 2.

Table 4. Use of tasks for development of reading comprehension skills or strategies depending on class size

Every or almost every day	Percent of students		
	Class size up to 12 students	Class size from 13 to 24 students	Class size bigger than 24 students
Locate information within the text	85,6%	75,8%	83,6%
Identify the main ideas of what they have read	64,7%	70,3%	73,5%
Explain or support their understanding of what they have read	67,3%	62,0%	67,8%
Compare what they have read with experiences they have had	42,1%	47,9%	55,3%
Compare what they have read with other things they have read	16,6%	16,3%	26,0%
Make predictions about what will happen next in the text they are reading	13,0%	18,2%	28,4%
Make generalizations and draw inferences based on what they have read	58,2%	56,2%	62,4%
Describe the style or structure of the text they have read	11,8%	10,1%	10,0%
Determine the author's perspective or intention	15,5%	16,0%	28,5%

Contrary to results of a study carried out by Ting and Spyros (2017) about class size effects on PIRLS results in Romania, analysis of Latvian data done by authors of this paper show that bigger number of students in class on average is connected to higher academic performance (see Figure 1). This result provides a support for a need of further school optimization process in Latvia.

An OECD (Organisation for Economic Co-operation and Development) TALIS (Teaching and Learning International Survey) 2018 study has indicated that the population of teachers in Latvia is on average a little older than in other countries which took part in the study (OECD, 2019). Knowing this, authors of the paper performed a data analysis to capture if there is a difference in application of methods for teaching reading depending on a teachers' age.
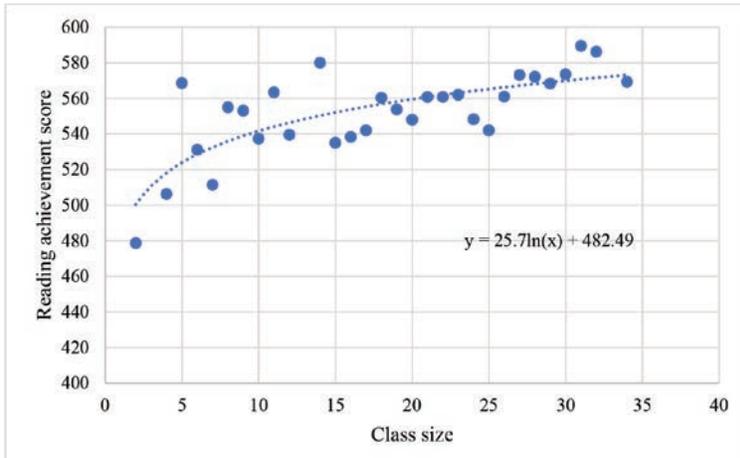
Figure 1. Reading achievement and class size

Table 5 presents Latvian 4ᵗʰ grade students split in three groups according to the age of their teacher and what percentage of students in each of these three groups experience a particular pedagogical approach every or almost every lesson. The results of the analysis display that with age it is more common for teachers to link new content to students' prior knowledge and to provide an individual feedback for each student. More than a half (55 percent) of students whose reading teacher is of age 60 or higher receive reading materials that match the students' interests every or almost every lesson comparatively to 34 percent of such students whose teachers are younger than 39. On the other hand, younger teachers encourage student discussions of texts even more than their older counterparts even though this method in general seems to be very popular in Latvia.

Table 5. Percentage of students who experience different methods according to teacher's age

	Percent of students		
Every or almost every lesson	**Teachers' age up to 39 years**	**Teachers' age from 40 to 59 years**	**Teachers' of age of 60 or higher**
Provide reading materials that match the students' interests	34,2%	50,2%	55,0%
Provide materials that are appropriate for the reading levels of individual students	19,6%	29,6%	29,2%
Link new content to students' prior knowledge	56,7%	79,2%	86,4%
Encourage students to develop their understandings of the text	84,1%	83,0%	91,0%

Every or almost every lesson	Percent of students		
	Teachers' age up to 39 years	Teachers' age from 40 to 59 years	Teachers' of age of 60 or higher
Encourage student discussions of texts	93,6%	82,6%	80,0%
Encourage students to challenge the opinion expressed in the text	23,2%	26,5%	25,8%
Use multiple perspectives (among students and texts) to enrich understanding	52,7%	36,7%	56,5%
Give students time to read books of their own choosing	18,8%	14,9%	16,1%
Provide an individual feedback for each student	23,4%	36,1%	42,4%

Differences in approaches of teaching reading comprehension skills and strategies depending on teachers' age are illustrated in Table 6. Teachers of older age more often ask their students to:

- Locate information within the text,
- Identify the main ideas of what they have read,
- Compare what they have read with other things they have read,
- Make generalizations and draw inferences based on what they have read, and
- Determine the author's perspective or intention.

In general, it can be witnessed that a larger proportion of students who are taught by teachers of at least 60 years of age experience meaningful tasks which enhance development of their reading literacy skills more often.

Table 6. Percentage of students who experience different tasks for development of reading comprehension skills or strategies according to teacher's age

Every or almost every day	Percent of students		
	Teachers' age up to 39 years	Teachers' age from 40 to 59 years	Teachers' of age of 60 or higher
Locate information within the text	62,9%	83,4%	81,6%
Identify the main ideas of what they have read	60,8%	68,9%	86,8%
Explain or support their understanding of what they have read	44,4%	69,4%	63,4%
Compare what they have read with experiences they have had	52,5%	49,2%	52,7%
Compare what they have read with other things they have read	5,4%	20,3%	32,1%

Every or almost every day	Percent of students		
	Teachers' age up to 39 years	Teachers' age from 40 to 59 years	Teachers' of age of 60 or higher
Make predictions about what will happen next in the text they are reading	16,5%	22,0%	25,0%
Make generalizations and draw inferences based on what they have read	44,2%	60,1%	66,0%
Describe the style or structure of the text they have read	8,0%	9,0%	17,6%
Determine the author's perspective or intention	17,9%	18,3%	36,3%

Results of this study show situation in Latvia and therefore cannot be generalized internationally. Authors of the paper also note that for more precise interpretation of results an in-depth analysis should be performed in further studies by controlling effects of different context factors, e.g. geographical placement of school, school type etc.

Conclusions

Main findings of the study show that:
- Frequent use of some teaching methods lead to higher reading achievement.
- On average the achievement level in Latvia is higher in bigger classes.
- Class size also determines application of some reading development methods.
- Use of different pedagogical methods is partly determined by teachers age (length of service and therefore – experience).

Based on results of the study following recommendations for teachers can be drawn. It is suggested that reading teachers of primary grades in Latvia should do the following as frequent as possible:
- Provide materials that are appropriate for the reading levels of individual students;
- Link new content to students' prior knowledge;
- Encourage students to develop their understandings of the text.

It is recommended for all subject teachers as frequent as possible to ask their students to:
- Locate information within the text;
- Explain or support their understanding of what they have read;
- Compare what they have read with other things they have read;

- Make predictions about what will happen next in the text they are reading;
- Determine the author's perspective or intention.

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THE STUDENTS` VISUAL LITERACY FOR KNOWLEDGE CONSTRUCTION IN THE HISTORY OF LATVIA AND THE WORLD

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ABSTRACT

The publication aims to present research on the integration of visual literacy in the learning process and its influence on students` knowledge construction. Mainly in the acquisition of History of Latvia and the World but also related subjects, that is topical in context with ongoing educational reform in Latvia.

Conclusions are based on qualitative data gathered directly from educators of primary and secondary education who developed and approbated assignments for pupils, which includes visual information sources.

Keywords: visual literacy, knowledge construction, the History of Latvia, the History of World, educational reform, primary education, secondary education.

Introduction

The concept of "visual literacy" applies to visual sources of information that have emerged in different periods as a result of the life activities of different people and related to different branches of science — starting with drawings on the walls of the cave, which date back to the prehistoric period, ending with images as elements of multimodal texts created using contemporary technologies. Those technologies make possible the production of visual information sources at large volumes and are rapidly evolving. Thus, visual sources can be offered to audiences measured in millions. Therefore, a situation arises where the daily life of people, including pupils, is saturated with various visual information sources. That affects how people perceive information and the ability of people to analyze it critically. The abovementioned perception and ability are topical both in the science of history to analyze/interpret visual sources of history and in pedagogical science in order to develop critical thinking and construct knowledge. Hence visual literacy is necessary not only to study, develop critical thinking, and to construct knowledge, for example about history, but also to avoid demagogy and propaganda, which is often carried

out with the help of various modern media which contain essential visual elements.

Considering the topicality of this research – the research work in Latvia, which analyzes the integration of visual literacy in the teaching and learning of history, as well as the activities directed at the development of didactics of history in general, are rare and fragmentary. Often, the integration of visual information sources in the learning process is considered indirectly in the research, or these researches are devoted not to the theory of information source analysis but its application[1].

In an article and underlying research, the visual literacy is being analyzed as a tool which can be used to develop the ability to interpret images (visual sources of history) to construct knowledge about the history of Latvia and the World. Therefore, the concept of "knowledge construction" also had to be taken into consideration. Concept knowledge construction can be briefly explained as the idea that understanding and remembering information is improved if a person actively tries to process and use the new knowledge in different ways, rather than when one is offered a ready-made informative text intended to be memorized mechanically. Actively using the new knowledge in different ways creates links between the already known and the new information, and it increases the possibility that the new information is going to be included within the pupil's perception of the world. For example, a pupil not only knows the features of a totalitarian regime but is also able to identify them in modern political systems.

The research problem was defined as such: integration of visual literacy for knowledge construction in the process of learning Latvian and world history. The study aimed to explore how visual literacy promotes students` knowledge construction about the history of Latvia and the World. The research design that was used to achieve this aim was action research.

In the research literature, no clear concepts were found on how to develop visual literacy by facilitating the construction of knowledge and how to integrate them into the learning process of Latvian and world history. Therefore, the research was designed as an interdisciplinary study, including both the perspectives of history and pedagogy and outlined: 1) the elements of approaches (in the context of Frank Serafini's developed approaches: Art Theory and Critic[2], Grammar of Visual Design, Media

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[1] It should be noted that a similar situation in the education environment of Latvia has developed in relation to the didactics of history in general – it lacks a comprehensive, systematic and theoretically grounded approach.

[2] Which is related to Erwin Panofsky's iconological method used by historians to analyze artworks as sources of history.

Literacies (Medienkompetenz) (Serafini 2011)); 2) theoretical examples of assignments (corresponding to "Revised Bloom Taxonomy" (Leslie 2016)) and analysis of assignments which were practically developed and implemented during the study; 3) elements of the evaluation criteria that can be developed. The research focus was on exploring the views expressed in theory and confronting them with the situation in the field of visual literacy in the teaching of history in Latvia. So, the research was not limited to theory studies, as it involved collaboration between professionals in the field and practical steps were taken to identify how visual literacy is currently integrated into the history learning process in Latvia and whether and how it is/can be improved.

Methodology

Methods of data collection used in the research are the content analysis to study the theory of visual literacy in history and pedagogy in the world and Latvia. Secondly, the opinion of the university students – teachers of history and teachers who teach history-related subjects (social sciences, politics, philosophy, cultural studies, literature) – has been studied through the survey.

Discussion to explore the theory and draw conclusions about the visual literacy in the Latvian educational environment, together with practicing history teachers and history teachers in training, as well as other professionals working in history-related institutions (within the University of Latvia, Faculty of History and Philosophy).

Assignment development, with the aim, based on the conclusions of this discussion, to develop assignments and to implement the acquisition of visual literacy integration in the history learning process. Document analysis (different assignments) to obtain data on the effectiveness, positive, and negative aspects of the assignments. Focus group discussion with the participants of the research process to evaluate the possibilities provided by visual literacy in the construction of knowledge.

Action research was chosen because it is directed to cooperation. The cooperation took place between the researcher[3] and the teachers – practitioners (and university students at the same time) – the participants of the study, whose study plan included a course within which the research was implemented and whom themselves work in an educational institution. The cooperation also took place between the participants of the study and

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[3] Who pursued some of the lectures in the study course "Vēst5140: Analysis of Historical Sources" and practically works with pupils in primary and secondary education.

the pupils they taught and with whom approbated the assignments created during the lecture cycle.

The research process lasted about six months and consisted of five stages: 1) theory studies and preparation for practice (conducting part of the lecture course during which the research was conducted); 2) work with teachers – university students during the lecture course (lecture, seminars, reflection, assignment development, and implementation); 3) mentoring university students in their work with their pupils; 4) data processing and reporting to formulate and disseminate knowledge.

Results

Theoretical framework

The theoretical framework of this research was developed, and its summary is offered further in this article structured as follows: visual literacy as a theoretical problem and research topic; approaches to integrating visual literacy into the teaching process of Latvian and world history; knowledge construction as a concept and its topicality in the Latvian education environment.

Visual literacy as a theoretical problem and research topic

Topical concept of visual literacy and related semantic fields in the 20th and 21st century have been analyzed in English and German research literature. This research literature offers many designations, which can be attributed to visual literacy[4]. In the Latvian educational environment, this concept (visual literacy) is relatively recent; thus, the discussion about the use of terminology is still ongoing in some ways. In this research, the concept of visual literacy (vizuālā pratība) was applied due to it being used in the educational environment of Latvia (Gorbāns 2010). It can be briefly defined as "ability to interpret images and create new images to communicate ideas and concepts" (Stokes 2002, 10). Also, it must be added that the alternative use of this concept is being used in the educational environment of Latvia. The concept of visual literacy (vizuālizpratne) has been adopted in the Latvian language as "a complex

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[4] For example, "Bildliteralität", "visual competence", "visuelle Kompetenz", "image competence", "Bildkompetenz", "visual education", "visuelle Bildung", "visual learning", "visuelles Lernen". These designations can be attributed to close standing semantic fields and often are used as synonyms (Hug 2012). More detailed explanation and analysis of concepts can be found in the Masters` thesis "The Students` Visual Literacy for Knowledge Construction in the History of Latvia and the World". (Ozoliņa 2018, 10–13).

compound of sub-competencies for the reception and production of images, as well as reflection of these processes." (Friče 2019, 142). This concept is used because visual literacy in conjunction with concepts used in Latvian to describe literacy (such as "izpratība," "rakstītpratība," "pratība") "is too narrow a concept, and it is necessary to define it as a visual competence to cover all attributed to it. [..] as a competence that encompasses knowledge, skills, and attitudes and is more freely applicable to different fields." (Avotiņa 2019, 37)[5].

Integrating visual literacy in the learning process evaluation criteria and guidelines should be developed to identify whether a person can work with visual information sources qualitatively. Criteria must be relevant to the education of the 21st century, so there should be defined achievable results. The achievable results after which it is possible to determine the level of visual literacy should not be simplified. For example, the capability of recognizing the works of specific artists is not an absolute indicator of visual literacy but only refers to a specific element of it.

Developing visual literacy requires to take in to account several elements. Firstly, the development of the ability to recognize, classify and perceive the direct meaning and essence of perceived visual information. Secondly, it requires developing the ability to work with and interpret visual information sources qualitatively. For example, analyzing a visual information source in the context with an era in which it was created. Thirdly, use the information obtained by linking it with either emotions or cognitive activities with the purpose of understanding previously acquired information, confronting with other sources of information, and creating something new. Fourth, it is necessary to develop the ability to share with the newly created unit, to form and defend their reasoned opinion.

Criteria that describe the acquisition of visual literacy can be defined as such: firstly, uses digital technologies to find and process visual information sources, as well as can identify the types and volumes of sources that will be needed to achieve the goal. Secondly, can interpret, analyze, and evaluate visual materials, as well as the sources from which these materials were derived and authors' motivation. Understands how and why a visual source of information has been created, as well as what it implies. Knows and can apply the strategies necessary for both internal and external source criticism. Third, can use visual sources of information to communicate, as well as creates new sources of visual information. (Ozoliņa 2018, 14–15, 17–18)

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[5] This use of concept was not included into the theoretical framework of research due to it being published after the research was already finished.

Approaches to integrating visual literacy into the teaching process of Latvian and world history

The English and German research literature connected with the analysis of visual information sources contains a wide range of research. However, the problem of integrating theoretical research into pedagogical activity and conducting empirical research still exists today. In 2015, it was pointed out that research on visual information sources in teaching methodology is rare and that researchers and professionals in the field often have to adapt their methodological solutions from similar disciplines (Hecke 2015, 179).

The problem of no consensus on the use of the concept and possibilities of integrating it in education can be linked with concepts "visual literacy" contradictory nature. On the one hand, it is a multidimensional concept which is topical in many fields of knowledge and contexts. For example, "aesthetics, anatomy of the eye, body language, cognitive psychology, communication theory, cultural anthropology, instructional technology, mental imagery, neurophysiology, perceptual development, psycholinguistics, semantics, and visual perception." (Michelson 2017). So the desire to make visual information source analysis interdisciplinary is logical in order to avoid misunderstandings, especially in the primary and secondary school. On the other hand, in this research, the process of integrating visual information sources, specifically in the field of history teaching and learning, was essential. In order to understand how it is possible to integrate visual information sources in history teaching and learning process, it is necessary to find points of contact between, firstly, approaches and methods that are topical in the field of academic history, secondly, to what extent and how these approaches and methods can be integrated into general education.

Essential approaches to research are analyzed as complementary: Grammar of Visual Design, Media Literacies; Medienenkompetenz, Art Theory, and Critics. According to Frank Serafini, who defined these approaches: "provide teachers with diverse lenses through which to focus students' attention to visual aspects of the multimodal texts they encounter. "(Serafini 2011, 343).

The grammar of Visual Design – the author proposes to structure this approach around three essential elements: composition, perspective, and visual symbols. The first two elements of this approach are in line with the first level of the iconological method[6] or pre-geographical description.

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[6] The method developed by Ervin Panofsky and other so-called Warburg`s school representatives, they insisted that one does not have to put up with a formal approach to the analysis of a work of art (by analyzing only style, composition, color), but the analytical practice must be developed and artwork used as a source of history.

Using this approach and its analogy with the iconological method, one can master basic concepts, develop the skills to verbally express the visible elements – objects, events, artistic style features. It makes possible further analysis of the source of visual information, which, in the case of history, is related to the exploration of the context of the creation of the artwork.

Media Literacies / Medienenkompetenz – this approach corresponds to the second level of the iconological method or iconographic analysis. Applying it, it develops the ability to understand, question, and critically evaluate different types of sources in different contexts. Understand the ways, techniques, and goals with which the message contained in the source is created. From the perspective of the iconological method, artistic motives, or combinations of them, should be linked to different themes, concepts, identifying specific scenes and allegories. Attention should be paid to how the particular theme, the concept was depicted in the respective historical period – it is necessary to expand the knowledge of the specifics of historical periods and traditions of representation in this historical period. So it also develops the ability to choose the source of information according to the situation or the goal.

Art Theory and Critics – this approach is modeled based on the iconological method, offering educators to use the structure of it as a framework to develop pupils' understanding of the visual elements of multimodal texts. In the context of the previous approaches, the first two levels of the iconological method were described. The third level of the iconological method aims to make possible the interpretation of the meaning and content of the work of art. It is done by using information obtained during the first two levels of analysis. Visual information source in history science is seen as an expression of the attitude of the people of the historical era towards the world. Therefore, at this level, it is possible to determine the historical context of the artwork, its message, and underlying values. In order to determine previously mentioned, extensive knowledge of history is needed.

It should be noted that in the research literature the direct adoption of the iconological method at primary and secondary school level is not evaluated positively because this method is too advanced and specific to the level of general education (Schreiber 2004, 60). However, if the structure and elements of this method are qualitatively integrated into the learning process, they can contribute to good results.

Knowledge construction as a concept and its topicality in Latvian education environment

"Knowledge construction" is a contemporary concept in the modern world and Latvian education environment, where the essence is that the pupil uses facts, information received and builds knowledge.

One of the fundamental insights underlying the concept is that human thinking processes work so that new information is associated with already known information as well as personal experience. The process of capturing and processing new information can give a new perspective on person's existing knowledge, supplementing the new information with details, and building a relationship (links) between the already known and newly acquired information. The function of these activities is to help a person reformulate the new knowledge or to restructure the existing knowledge, reaching a deeper level of understanding. Understanding the new information and the ability to remember it is enhanced if a person actively participates in the knowledge construction process and tries to process and use the new knowledge in different ways. When a person works with new information, constructs knowledge, creates new and changes existing associations that ensure that the human knowledge structure changes and improves[7]. Above mentioned links between the already known and the newly discovered information ensure that the new information is included within the persons` perception of the world[8]. With the qualitative formation of such links, a more complex and better integrated cognitive structure is created in the human mind, which facilitates the process of remembering, the ability to recall the information (After King 1994, 339).

The knowledge construction process can be characterized by several elements and activities that are also typical of Bloom's taxonomy (Bloom, et al., 1956) and Revised Bloom's taxonomy (Anderson, Krathwohl et al. 2001).[9]

When examining the relationship between visual literacy and the construction of knowledge, two aspects should be considered. Firstly, from the perspective of the historical development of humanity – is to be taken into account that there has been a visual culture at all stages and regions of civilization development, and it has always been essential in matters related to the process of human communication and knowledge acquisition (Hug, 2012). Also, the fact that visual communication forms existed long before the emergence of written communication.

Secondly, from the perspective of human development – information that children derive from visual information sources is fundamental to their development and learning process. Because "children learn to perceive and interpret, that is to "read" body language and other visual signs before they

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[7] In contrast to a situation in which one has to remember unknown information offered as a ready-made informative text which has to be mechanically remembered.

[8] For example, a pupil not only knows the features of a totalitarian regime but is also able to identify them in modern political systems.

[9] A comparison of taxonomies with examples of assignments that integrate visual literacy can be found in the Master's thesis underlying this article (Ozolina 2018, 27–29).

begin to perceive and interpret, to "read" the words they hear. In fact, for the seeing child, it is primarily the successful "reading" of visual signs that makes possible the "reading" of heard verbal signs. For him, this primacy of visual information in human development made it a critical feature in the formation of language and, subsequently, knowledge." (Michelson 2017, 95).

Data analysis and evaluation

Lecture cycle was carried out to obtain data from study courses that took place at the University of Latvia – "SDSKR003: Master's Practice in Research" and "Vēst5140: Analysis of Historical Sources". Participants of this lecture cycle had to: a) fill out a survey "Visual sources of information in history and related subjects," which aimed to obtain qualitative (rather than quantitative) data to explore teachers' experiences in integrating visual literacy into the learning process; b) to develop, implement and reflect on assignments for primary and secondary education pupils which were aimed to develop visual literacy and improve knowledge construction. Partaker of the study were students studying to obtain history teacher`s qualification and had to attend above mentioned lecture cycle, a person who works at the museum and was interested in attending lecture cycle and teachers of subjects which are related to history.

Survey

Analyzing data gained by the survey, it was concluded that 88,9% of respondents use visual information sources at their pedagogical practice. Motivation tendencies of doing so can be defined as a) practical reasons, e.g., visual sources are used in textbooks and methodical materials used by the teacher; b) subject specificity, e.g., visual art, cultural science, art history; c) peculiarities of pupil perception, e.g., nowadays, visual information sources play an essential role in the daily life of children and young people. Therefore, the information should be provided in a more easily understandable way; d) development of pupils' critical thinking, e.g., encourages the pupils to think, interpret different elements of the image, their meaning, and relation to the time of the creation of the source and its purpose.

When asked to identify knowledge and skills needed for dealing with visual information sources respondents identified such needed knowledge: about time, the area of what the visual source provides information; about the cultural era represented by the source; knowledge of source creation techniques and technologies; preliminary knowledge in the field of visual research (this should instead be attributed to skills); basic knowledge of means of art expression and their use. Skills defined as necessary for

analyzing visual sources was: the ability to select the necessary information; ability to see the details and the overall picture; ability to analyze, select and group information; ability to see, observe, analyze, conclude.

More detailed responses about what knowledge is needed to analyze visual information sources have been provided by respondents whose activities have been linked to visual sources of information outside their pedagogical process. In general, respondents have the understanding that visual information sources should be viewed in context with the place and time of creation, and that there is a need for specific knowledge to work with visual information sources. About the necessary skills – the impression is that most respondents have no notion of the specific skills needed to work with visual information sources because respondents mostly indicated the skills needed to analyze different sources of information in general.

Respondents were asked to provide their examples of assignments that included visual information sources. These assignments were of different degrees of complexity and meant for people of different ages. Assignments reflected the perception of respondents on how to use visual information sources in the pedagogical process. It was observed that this understanding is related to respondents' education and experience of working with visual information sources outside of school. Not all respondents were able to define the purpose of their proposed assignment adequately and to clearly define what knowledge and skills are needed or developed in the process of performing the assignment.

Respondents had to analyze four assignments that included visual information sources. One of the criteria that had to be analyzed was to evaluate the potential of the assignment in constructing pupils' knowledge and its potential to develop skills to work with visual information sources. The study analyzed two assignments and respondents' views on them – respondents rated one of these assignments as the most relevant to the previously defined criterion, but other as the least appropriate. In the assignment that respondents rated as meeting the criteria, respondents saw the need to use both knowledge and skills. Respondents did not define the need to apply any skills in an assignment that was assessed as irrelevant to criteria.

Thus, it can be concluded that in assignments aimed at developing visual literacy and promoting knowledge construction, it is necessary to include both the need to use the knowledge and the opportunity to develop skills. As well it is crucial to design assignments in which visual sources are included meaningfully not formally. It seems logical, but when analyzing the exams in the History of Latvia that were offered until 2018, it could be established that the percentage of visual information sources to be included is low, as well as the fact that these assignments (such as those offered

to respondents in the survey which were included in the 2019 and 2011 exams in Latvian History for 9th grade) do not always offer adequate use of skills in the analysis of visual information sources. Similar conclusions can be attributed to exams (regarding 9th grade) of other years – 2015, 2016, 2017. Mentioned exams are analyzed in the master's thesis "The Students` Visual Literacy for Knowledge Construction in the History of Latvia and the World" (Ozoliņa 2018, 39–40) on which this publication is based.

However, the situation has improved in the 2018 (National Centre for Education 2018, https://visc.gov.lv/vispizglitiba/eksameni/dokumenti/ uzdevumi/2018/9klase/9kl_vesture_lv.pdf) and 2019 exams (National Centre for Education 2019, https://visc.gov.lv/vispizglitiba/eksameni/ dokumenti/uzdevumi/2019/9klase/9kl_vesture.pdf). In the 2018 exam, the visual source of information had to be confronted with the written ones (3., 6., 7. assignments in Part 2 of the exam), in 2019 (9. Assignment in Part 2 of the exam) the visual information sources (political posters) had to be linked to the historical reality of the time of their creation. Thus, those assignments can be rated as meaningful and demanding usage of more advanced skills in analyzing visual sources.

Development, implementation and reflection on assignments

In addition to the survey, assignments developed, and implemented during the lecture cycle meant to integrate visual literacy in the learning process to facilitate knowledge construction, were also analyzed. Each participant had to develop two assignments, but their analysis includes one of the assignments offered by each participant, as they were similar in the approach and showed a similar understanding of the respondent's visual literacy and knowledge construction elements. The developed, approbated assignments, their descriptions, data summaries, and essays provided by the participants of the research were analyzed. The results were categorized: knowledge and skills that each exercise helps to develop, and conclusions.

The following are two examples of assignment analysis: one assignment meant for elementary and one for secondary school. The assignment for elementary school – pupils were given the assignment of analyzing a propaganda poster of the Vichy regime and answering ten questions about the poster. The knowledge that it helps to construct can be defined as such: French policy and society during the Vichy regime; the concepts of propaganda, motto, occupation, cultural values; social roles attributed to genders during the Vichy regime.

Skills what this assignment develop was defined as such: reasonably judge semi-familiar information that hides the instructions that can be used to perform an assignment; using visual symbols to determine which country is covered by the proposed poster; determine what type of propaganda

(national-socialist / fascist; communist; democratic) is visible in the poster and what visual signs show it; to conclude (given three options) the correct translation of the motto offered in French; to identify the historical personality seen in the poster, knowing which country and in what period this poster has been created; to define the concept of the ideal society offered by the Vichy regime based on a diverse depiction of different social groups of men and women; to make conclusions about the cultural values of the regime, using a visual source of information. It can be concluded that this assignment develops the child's logical reasoning about semi-familiar information. Also, the questions (regarding visual source) should be organized in a particular order so that the pupil can step by step build their knowledge – starting with the lightest questions (also in the test format) and ending with the most difficult – judging what regime the poster reproduces.

The assignment for secondary school was developed by museum pedagogue, which determined the specificity of the assignment in question and the ability to implement it. The pupil should choose one particular cultural field that was relevant to the turn of the 19th and 20th centuries and find information about this area in the period considered. For example, press, photographs, memories, documents (if available), works of art can be used as sources. Besides, literature that can be obtained from a library or websites should be used. Based on the information obtained, the pupil has to draw a cartoon (analogous or digital) about an event, a situation that has been topical in a particular time and cultural field. The assignment supports the knowledge construction of the: concept "cartoon"; visual culture of the particular period; current events and personalities in a given period. Skills what this assignment develop was defined as such: identify what sources of information are available about a particular area, personality, event; to work with a visual source of information rather than perceive it as a static illustration of the era; to apply Erwin Panofsky's iconological analysis, at least its first two levels; to get information both from the source and create a new source of visual information.

It can be concluded that the assignment has considerable potential to develop the ability to work with visual information sources – one must be able to perceive the particular period of history and make the cartoon so that it can be perceived in the social and historical context of the appropriate time.

When discussing an assignment[10], the negative aspects of it were defined – the assignment is too time-consuming and therefore, impossible

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[10] It should be taken into account that this assignment was not implemented. But the author of the assignment discussed it with his colleagues in the museum, as well as with the participants of the lecture cycle and the author of this study.

in the museum environment. Execution of the assignment would require the preparation of a particular project, as it is not included in the museum's offer. Besides, experience shows that teachers do not usually have the time to invest many resources in preparing for a museum visit. The pupil may not have enough understanding of what the cartoon is. It is doubtful whether the pupils would understand how to transfer the information about the period to the cartoon form. The suggestions were made in order to make assignment possible, firstly, to develop an assignment as a project where one part is done at school, but the other part at the museum. However, the author of the assignment, based on experience, stated that it would not be possible. Secondly, to change an assignment from making a cartoon to making a comic strip – possibly a more understandable option for pupils.

It can be concluded, analyzing all the information obtained during the study, that visual information sources can be integrated into the learning process in different ways, in order to develop knowledge construction. Visual sources of information can be used as introductory material for a topic. In this case, the assignments should be designed to enable students to retrieve and classify the knowledge relevant to the new topic from the visual sources using the skills required to analyze those sources. Visual sources of information can also be used to encourage pupils' emotional attachment to learning content that can improve the learning process. Visual information sources can also be used as a guide to the learning process, which can help in the construction of new knowledge and the development of skills using existing knowledge and skills. In this case, the assignments should be designed to acquire new knowledge and develop skills through existing knowledge and skills and logical actions and conclusions. Visual sources of information can also be used to create the content depth of a known topic. In this case, the assignments should offer students the opportunity to use the knowledge they have about a topic to find and implement opportunities to explore the topic more in-depth, possibly using atypical methods. In visual information sources, time structures are not primary, unlike verbal sources of information, so visual information sources can also be used to stimulate the analysis of problematic issues in several time dimensions simultaneously – in the past, present and future. It can develop the ability to look at specific situations and issues more broadly, taking into account the experience of people who have lived in different periods and locations.

Conclusions

The essential outcomes were several, firstly, examining the theoretical material in which concepts of visual literacy and knowledge construction have been analyzed from the perspective of history and pedagogy, led to

a conclusion that the concepts visual literacy and knowledge construction are not clearly defined as well as the principles of integration of visual literacy and knowledge construction in the history study process. Also, the intention of research to tightly integrate pedagogy and history from various aspects is atypical in the Latvian educational environment at the academic level. Since at this level, research in didactics of history is fragmented and underdeveloped. Due to this, the elements of approaches, evaluation criteria, and guidelines were outlined in the research (see Sect. 1.1., 1.2.).

Secondly, the unified understanding of the integration of visual literacy in the learning process among teachers of the history and related subjects (similar to the research literature) was not detected. This conclusion was made both by carrying out the content analysis of different sources of information and by offering respondents who work in educational institutions and whose work is related to history, to fill out a survey on visual literacy and knowledge construction. The qualitative analysis of the obtained data led to the conclusion that visual information sources are integrated into the learning process and that respondents were partly able to define the knowledge and skills necessary to analyze visual information sources.

Thirdly, as a result of research, during the master's practice at the University of Latvia Faculty of History and Philosophy, the lecture cycle was implemented. During the lecture cycle actions of participants were moderated. The objective was to develop participants (as practicing history educators) ability to use visual information sources in the learning process. Another objective was to construct participants understanding of concepts visual literacy and knowledge construction.

Fourth, evaluating the experience and data gained during the study it can be concluded (see Sect. Chap.2) that the visual sources of information should be used in different ways and different parts of the study process. Visual literacy can be integrated into all parts of the learning process – a) introduction of the content; b) creating an emotional attachment to the given content; c) using existing knowledge and skills to gain new knowledge and skills; d) to develop a depth of content; e) to analyze one problem in different time dimensions. Also, visual literacy integrated into different parts of the learning process can be used to encourage knowledge construction.

Practical use of the research can be defined as such – the outlined elements of approaches, evaluation criteria, guidelines, developed and analyzed assignments regarding visual literacy and knowledge construction can be directly implemented into the history learning process. As for the scientific novelty of the research – it focuses on a specific field of

studies that encompasses two branches of science and two concepts of "visual literacy" and "knowledge construction" used in different contexts. There is no consensus in this field of research in the broader context, but in the Latvian educational environment at an academic level, it is related to the area of neglected didactics of history and thus is fragmented and understudied.

However, it should be noted that the following factors influenced the implementation of the research: a) the study was carried out during previously mentioned lecture cycle at the University of Latvia, which determined both the orientation of the research topic, the circle of partakers, respondents and methods used during research. b) the study involved people working in educational institutions in Latvia who work with primary and secondary education students. It determined the aspects of the study related to the age peculiarities of the students, the topics covered in history lessons, as well as the resources available and methods chosen to implement different ideas.

Further research perspectives could be defined as follow: a) possibilities of integrating visual information sources in the study process of history to foster the construction of pupils' knowledge, could be further explored involving a more comprehensive range of participants; b) the lecture cycle during which the study was carried out could be re-implemented to confront the newly obtained data and its analysis with those obtained in this study; c) implemented and analyzed assignments were developed corresponding to "Revised Bloom Taxonomy" (Leslie 2016). However, in context with ongoing educational reform in Latvia (National Centre for Education http://visc.gov.lv/visc/projekti/esf_831.shtml), it would be beneficial to reconsider developed assignments using SOLO taxonomy which "describes the growth in complexity of performance in many learning assignments, from the earliest engagement in the assignment to expertise. Learning grows along at least two dimensions: (a) the level of abstraction, or mode, of the contents learned (five such modes are recognisable from infancy to adulthood); and (b) the cycle of increasing complexity that learning undergoes within any given mode [..] to state the desired level of performance in many important curriculum topics in a way that can be used (a) for criterion-referenced assessment in particular subjects, and (b) for discussing comparable levels of attainment across different subjects and different schools." (Biggs, Collis 1989, 151).

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WRITING (TEXT CREATION) DEVELOPMENT OF PRIMARY STUDENTS AT THEIR MOTHER TONGUE LESSONS: TEACHERS' ATTITUDE

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ABSTRACT

Referring to the results of the quantitative research, the article deals with how the primary teachers of the town X of Lithuania establish conditions for the formation of students' text creation skills; how text creation activities are organized at their mother tongue lessons; what teachers' attitude towards students' abilities to perform creative text tasks is. Referring to the data of the research, primary teachers working according to the curriculum of mother tongue education do not have enough time for the formation of students' text creation skills; only slightly more than a half of the teachers at least once a week give a lesson to form students' creative text skills and prepare students to create a text – they give a whole lesson on that and assign creative text tasks to students to perform them in the classroom. The fact that only about one-third of the teachers are satisfied with the outcomes of their students' creative texts, raises doubts about the following abilities of teachers themselves: to prepare for a text creation lesson himself/herself, to assign preparation tasks to students, to structure the lesson/process of text creation, etc.

Keywords: primary students, primary teachers, text creation, lesson of mother tongue education.

Introduction

Based on research (cit. *Creativity Development in Children at Home, at School and in Extracurricular Activities*, 2014), both according to society's attitude towards creativity and the results of creativity, Lithuania's situation is one of the poorest in the EU, and the progress is not sufficient. In Lithuania, the share of creative employees is one of the lowest in the EU and the share of employees who are considered non-creative is much higher than the average of the EU. There may be various causes of the gap in creativity and limited progress, among which one of the main causes

is insufficiently used possibilities while developing children's creativity at school (Ibid, p. 16).

In the process of mother tongue education, the creative tasks of a spoken and written text are focused on creativity development in children to the greatest extent.

According to the PIRLS (*Progress in International Reading Literacy Study*) report of 2016, the general reading achievement of the fourth-graders of Lithuanian general education schools has evidently increased eliminating the decline that formed between 2001 and 2011. Meanwhile, the situation of writing (text creation) remains a problematic area of education. In the reports of the national research of students' achievements (*Subject Report of the National Research of Students' Achievements of 2014*; *Subject Report of the National Examination of Students' Achievements of 2017*; *Subject Report of the National Examination of Students' Achievements of 2018*), the decreasing tendency of text creation of our primary graders is emphasized. Moreover, in the *Subject Report of the National Examination of Students' Achievements of 2018,* it was pointed out that since 2017 the results of the eighth-graders' writing test have significantly decreased as well. It is possible to presuppose that text creation skills insufficiently developed in primary grades cause difficulties in senior grades as well. Such a presupposition would be confirmed by the insights of the scientists of other countries (Genlotta, Grönlund, 2013) about the importance of the development of literacy skills: if children do not develop writing skills in their early years, later they will face bigger difficulties when they have to create longer and more complicated texts. It presupposes the **problem question of the research** – how is writing (text creation) development of primary students organized at their mother tongue lessons?

Having in mind that primary teachers are educators, on whom children's further learning and their success in future depend to a great extent alongside with the development of creative skills, the **aim of the research** is to evaluate the attitude of the primary teachers of the town X of Lithuania towards writing (text creation) development of students at their mother tongue lessons. The research intended to find out: 1) how teachers evaluate the conditions given by the curriculum of mother tongue education to develop students' creative abilities and to form text creation skills; 2) how text creation activities are organized; 3) what teachers' attitude towards students' abilities to perform creative text tasks is.

Methods of the research: scientific literature analysis, questionnaire survey, descriptive statistics.

Sample and procedure of the research. The research on teachers' attitude towards writing (text creation) development of students at their mother tongue lessons presented in the article is one of the parts of

the research "Assessment of Creativity of Primary Teachers of the Town X" conducted in the academic year of 2018–2019.

According to the data of the department of education of the town X, a total of 234 teachers work in the schools of the town X that deliver the primary education curriculum for the academic year 2018–2019. The permission to conduct the research was individually requested from the administration of each school presenting them the problem context of the research, the aim and objectives of the research, and defining the principles of research ethics – goodwill, respect for the person's dignity, justice, and the right to receive precise information. After the permission from the school administration was received, the potential research participants were given paper questionnaires, which they could fill in individually, at a convenient time for them, without the participation of the researchers, having agreed on the date of their return.

In the schools that agreed to participate in the research, a total of 167 questionnaires were handed out. 138 primary teachers filled in the questionnaires. Nine questionnaires that were filled in partially or not following the instruction were not analysed. Consequently, in the research report the generalized data of 129 questionnaires have been presented.

The demographic data of the research participants in fact reflect the situation of teachers working in the Lithuanian general education schools from the aspect of gender, age, and qualification. All the participants of the research are women[1]. The largest group was aged between 51 and 60 years (44%) and the smallest group was drawn from 60 and more year-olds (14%)[2]. Primary teachers with a high qualification[3] work in primary grades of the town X: out of 129 teachers who participated in the research 75 (58%) have acquired the qualification of a teacher methodologist, one teacher has acquired the qualification of a teacher expert. According to the work experience in primary grades, the biggest group of the research participants consisted of teachers, who have been working for 26–35 years (37%), the smallest group consisted of teachers, who have been working for the first five years (8%).

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[1] In Lithuania the share of men who work in primary grades is only 5,5% (*Lietuva. Švietimas šalyje ir regionuose 2017. Mokytojas* [Lithuania. Education in the Country and Regions 2017. Teacher], 2017, 25).

[2] Approximately a half of teachers who work in general education schools of Lithuania are 50 years old and over: teachers under 30 years of age make up 3%, 30–49 years old – 45%, 50–59 years old –39%, 60 years old and over – 13% (Ibid, 25).

[3] In Lithuania teachers who have the qualification category of a methodologist or an expert are considered teachers with a high qualification. In 2016 there were 36,4% of teachers with such a qualification in Lithuania (Ibid, 26).

Instrument of the research. The questionnaire of the teachers' attitude towards writing (text creation) development of students at their mother tongue lessons consisted of 19 statements that permit to identify how teachers evaluate the conditions given by the curriculum of mother tongue education to develop students' creative abilities; how text creation activities are organized; how teachers evaluate their abilities to establish favourable conditions for the formation and development of students' writing (text creation) abilities. Every statement was evaluated using a five-point scale from "strongly disagree" to "strongly agree." The overall indicator of each scale is obtained summing up all the scores of the respective scale. The internal consistency (Cronbach's Alpha) of the questionnaire of the teachers' attitude towards writing (text creation) development of students at their mother tongue lessons is 0,840.

Results

According to the *Lithuanian language curriculum for primary education* (2016), primary students should learn various strategies of the creation of a fictional text based on the elements of re-creation (reproductive creativity) and original creativity, i.e., 1) to create a story based on one's personal experience and an imaginary one: according to the series of pictures; according to the given beginning and end; independently changing and remaking the plan given by the teacher; according to the guidelines of the story; according to the example of the literary work they have read; according to a self-made plan; 2) to write a retelling using questions, outline, chain of actions; 3) to write a description of an object/event/phenomenon.

Retellings are probably the most reproductive tasks. During the Soviet times, various types of retellings (detailed, concise and selective) at the lessons of mother tongue education were one of the most frequent types of written assignments. In modern language teaching methodology, when particular attention is focused on the creative expression of the student himself/herself, the importance of retellings has evidently decreased (it can be noticed from the data of the picture 1 as well – only slightly more than a half of the research participants (64%) strongly agree / agree with the statement that their students write retellings). Nevertheless, we tend to think that this type of text tasks should not be underestimated – poor retelling skills especially manifest themselves in senior grades when writing essays, preparing independent written assignments, presentations, etc. It means that: 1) when it is necessary to shorten the text written by others or its fragment, good skills of concise retelling are obligatory; 2) when it is important to emphasize important things, good skills of selective retelling

are obligatory, 3) when it is necessary to present the content of the excerpt of the text, good skills of detailed retelling are obligatory. Moreover, every student combining intuitive and conscious understanding of a text must acquire knowledge and practical skills necessary to meet the motivation for self-expression, to create his/her own text. Having in mind that imitation is a psychological basis for learning a language, referring to the thoughts of one of the most famous specialists of the Lithuanian didactics Šoblinskas (1987), it is possible to give the following definition of the didactic importance of retelling: retelling requires to be able to think logically, to retain the consistency of the story, to distinguish between more important and secondary things; by going deep into the content and structure of a text written by others, a student learns practical linguistic activity, strengthens his/her own text creation skills; gets accustomed to using words and their forms not only correctly but also stylistically precisely; learns the ways of rendering thoughts – narration, description, reasoning; when writing retellings students more rapidly and to a greater extent feel the stylistic specifics of particular genres.
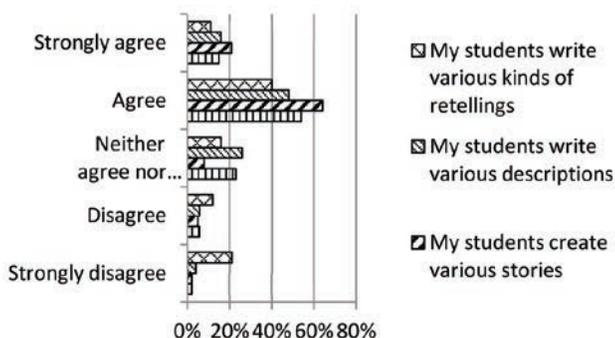
Figure 1. Distribution of the teachers' opinion about the text creation strategies they use (n = 129)

As the results of the present research show, one of the most frequent strategies used at the mother tongue lessons in primary grades is a story – 85% of the primary teachers agree / strongly agree that they assign this type of writing tasks to students (see Figure 1). Slightly smaller shares of the respondents strongly agree / agree (69%), that their students create fairy tales. From the linguistic point of view, a fairy tale is one of the types of narration with a trinomial (the beginning, the process and the climactic moment, and the end of the event) structure characteristic of it. Nevertheless, in comparison with a story, a fairy tale is a much more complex type of narration characterized by various levels of

the relation between fantasy and reality, specific elements of composition. In pedagogical and psychological literature, the importance of fairy tales created by the child is especially emphasized: creating a fairy tale and, most importantly, writing it is one of the most valuable ways of creative self-expression. Nevertheless, the results of this part of the research provoke ambiguous thoughts. Referring to the findings of the *Report of the National Research of Students' Achievements of 2014*, for our fourth-graders it is the most difficult to create a fairy tale. The results of the scientific research (Bražienė, 2004; 2018) also show that the plots of the fairytale texts created by primary students are very poor – primitive, without the development of the action, in the fairy tales created by students the aims, wishes, behaviour motivation of the main character are not always clearly understood, the causal relations of the characters' actions are not understandable, the narration of events lacks consistency and completeness, there is a lack of imagination, the reproductive creative resources to create fairy tales are predominant; the majority of the fairy tales created by the third and fourth graders meet only the most minimum criteria, referring to which foreign scientists (Applebee, 1989; Pitcher, Prelinger, 1963; Preece, 1987) among other types of narration distinguish fairy tales created by five-year-old children. Consequently, this context suggests the idea about the organization of creative writing activities in general – how much time is given for creative text tasks, how the students are prepared to perform them and where they perform them, what motivation to create texts students have and what teachers' opinion about the final outcome of the student's creative writing is.

In Saylik's (2014, 20) words, "creative writing skills of primary school pupils are a physical and mental capacity to create an original, detailed, flexible and fluent creative written text. The concept of creative writing skills is a complex theoretical construct, which implicates in itself pupils' abilities: to characterise the essence of a creative written text by creating an appropriate title (originality), to create the content of a creative written text and reveal its topic (elaboration), to create a structured creative written text (fluency), to create an expressive, logical, integral and consistent creative written text (flexibility)".

In the *Lithuanian language curriculum for primary education* (2016, 27), it is emphasized that creative writing should be treated as an activity enabling to creatively express oneself while creating a meaningful, interesting written text, to share thoughts, feelings, opinion with others. In this document, the guidelines of the development of writing as a field of linguistic activity are outlined. It should be noted that *the General Teaching Plan for the Primary Education Curriculum* (2017) permits teachers to decide how to organize the educational process and model the contents

of education striving for the aims of the primary education curriculum; it is possible to choose various ways of the integration of the contents of education, etc., i.e., teachers are given freedom to creatively plan and organize the educational process.

As it can be seen from the Figure 2, in the opinion of the majority of the teachers, who participated in the research, the curriculum of the Lithuanian language gives enough space for the development of students' creative abilities. Nevertheless, only almost one-third (26%) of the teachers, who participated in the research, strongly agree / agree with the statement that working according to the curriculum of the Lithuanian language during the lessons there is enough time for creative writing (disagree / strongly disagree – 39%). These numbers are illustrated by the teachers' comments, e.g.: *Sometimes teachers are afraid not to fit into the time of the lesson. We are glad that in our school there are no bells, and, in case of inspiration, we can work longer; Teaching grammar takes a lot of time, children do not memorize spelling and punctuation rules in any way. And let us not forget teaching reading skills. There is simply no time left for creative works in these 45 minutes of the lesson; Creative writing works take time, and where should we get it from?; (...) I would like to give more examples, creative thoughts, but the scope of the curriculum of the Lithuanian language is very large. We have to "run gallop"; There is not enough time to perform creative tasks because the scope and curriculum of the Lithuanian language are very broad; The lesson is too short, therefore, the possibilities for creation are limited.*
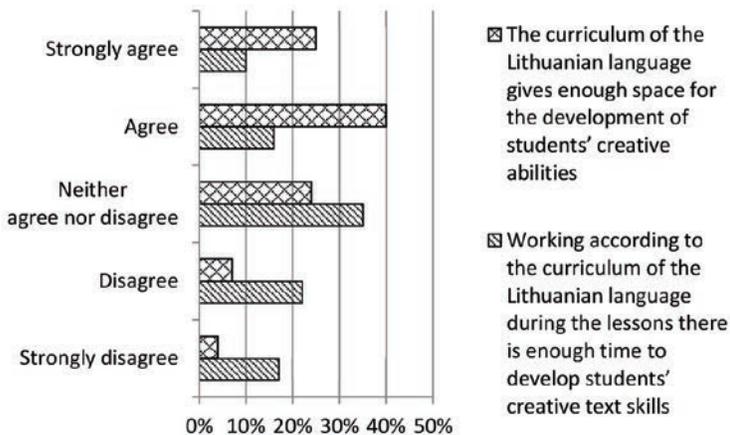
Figure 2. Evaluation of the curriculum of the Lithuanian language from the aspect of the development of creativity in students: distribution of the teachers' opinion (n = 129)

In this context, it could be pointed out that a bigger share (54%) of the research participants are over 50 years old. Consequently, they learned at school and the majority of them studied the didactics of mother tongue during the Soviet times, when the process of the development of the Lithuanian language was divided into separate fields, and at the same time into separate lessons – reading, learning grammar, and coherent language. Although in fact all the participants of the research are firmly convinced that they have enough didactic knowledge to teach students various text creation strategies, we tend to think that the experience of previous times, didactic knowledge and skills learned and established through many years of practical experience do not permit senior teachers to refocus on the system of mother tongue teaching/learning renewed after the restoration of independence, i. e., in the process of mother tongue education to integrate all the fields of linguistic activity – listening (understanding of a spoken text), speaking (production of a spoken text, expressing thoughts verbally), reading (reading techniques, understanding and using of the text that is read), and writing (writing techniques, production of a written text). Therefore, in the integrated lesson of the Lithuanian language, when the subjects of the knowledge of the language structure, reading techniques, understanding literature, writing and creativity training need to be combined, the teacher faces problems in the consistent and purposeful development of students' text creation skills.

According to Daffern and Mackenzie (2015, 24), "specific writing elements require systematic consideration in the teaching and learning of writing, including text structure, sentence and grammatical structure, vocabulary, spelling, punctuation, and handwriting or word processing". Creative writing is a thinking process that requires quite big intellectual efforts from the child. In order to perform a text creation task well, it is important for the student to have enough time to consider the stages of the creative process / to make a plan of the essay, to work out the ideas, to coherently, logically, precisely, and correctly write his/her thoughts, to discuss the text with the teacher/peers, then to improve, correct, and present it. Referring to the recommendations of the scientists (Calkins, Ehrenworth, 2016), the ideal writing workshop includes ten minutes of explicit instruction, at least half an hour of writing time, ending with 5–10 minutes of sharing and goal setting with a peer. Nevertheless, only slightly more than a half (59%) of the research participants strongly agree / agree with the statement that at least once a week they give a lesson to form creative text skills and prepare students for creative text work – they give a whole lesson on that (57%) (see Figure 3).
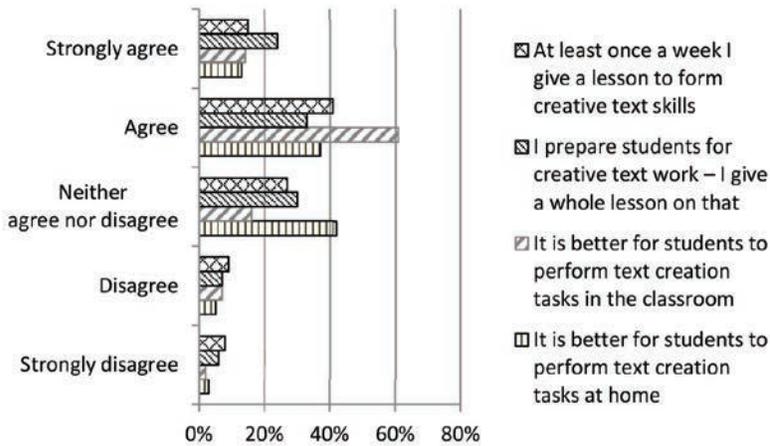
Figure 3. Distribution of the teachers' opinion about the time given for creative writing (n = 129)

Moreover, in this context, it is important to point out that in *the General Teaching Plan for the Primary Education Curriculum for the academic year 2017–2018 and 2018–2019,* the number of teaching hours for mother tongue education per week is quite big: 1 grade – 8 hours, 2–4 grades – 7 hours. Consequently, it is likely that the teacher when planning the lessons of mother tongue education could give a separate lesson for the formation of students' creative writing skills. This would not violate the integration of the fields of linguistic activity because in the creative writing lesson, listening, speaking, reading, and writing are inevitable.

As it can be seen from the picture 3, the teachers' opinion about where it is better for students to perform creative text tasks is twofold: some of them are convinced (strongly agree / agree – 50%) that it should be in the classroom, the others think (strongly agree / agree – 54%) that it should be at home. The scientists from other countries (Shook et al, 1989; Ritlyová, 2014) also notice that teachers ignore creative text tasks and usually assign them for homework. It must be mentioned that students have to be taught how to write: students must know how good they are at using theoretical knowledge in practice, i. e., whether they suitably create a text of one or another style, whether they consistently express thoughts, choose correct words, spell them correctly, etc. Another important element in the creative process is to encourage students to cooperate: to discuss about creative ideas, plans of writing, and revise students' work. If students have an audience who would listen to their writing, their motivation rises (Ritlyová, 2014). Therefore, it is possible to presuppose that when creative writing tasks are given for homework, the risk increases that the students

will face writing difficulties. When the students cannot cope with these difficulties, their activeness decreases and this may provoke the motives forming a negative attitude towards writing a creative text.

There are very few researches in Lithuania conducted more than a decade ago that would evaluate primary students' disposition to create (Schoroškienė, 2000; Jasinskienė, Ramaneckienė, 2004; Schoroškienė, Marcinkevičiūtė, 2008). It has been noticed that only a third of first and second graders have a disposition to create. Although third and fourth graders' creative dispositions are more distinct, however, a strong negative attitude towards creative text tasks remains. It is possible to state that it corresponds to the findings of the scientists from other countries: referring to Grainger et al (2005), the children aged 7–9 years expressed predominantly negative attitudes to writing, typically describing it as boring, whilst a small, but worrying proportion of those aged 9–11 reflected an indifferent, somewhat detached disposition. As the results of the present research show, 42% of the respondents strongly agree / agree that primary students like creative writing tasks (neither agree nor disagree – 43%, disagree / strongly disagree – 15%). By analogy – only about one-third of the teachers are satisfied with the outcomes of their students' creative texts (strongly agree / agree – 36%, neither agree nor disagree – 45%, disagree / strongly disagree – 19%) (see Figure 4).
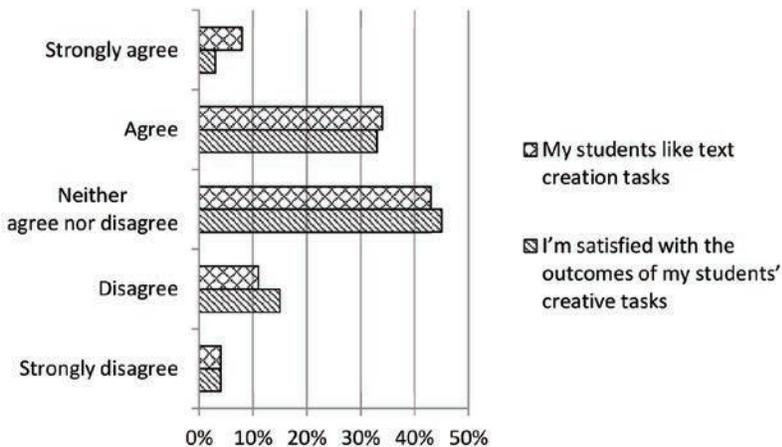
Figure 4. Expression of the teachers' opinion about the process of students' text creation and evaluation of outcomes (n = 129)

The results of this part of the research raise doubts about the following abilities of teachers themselves: to prepare for a text creation lesson himself/herself, to assign preparation tasks to students, to structure

the lesson/process of text creation, etc. Consequently, here attention is shifting towards the previously conducted research on the evaluation of teachers' creativity during the lessons of other subjects, in the conclusions of which it is stated that teachers lack competences related to the development of children's creativity: teachers plan their own activity during the lessons well but not the students' activity, its meaning and future outcomes; the main agent in the lesson is not the student but the teacher, who only partially properly chooses teaching/learning methods, poorly motivates students, does not establish conditions for students' initiative and creativity to unfold (according to *Creativity Development in Children at Home, at School and in Extracurricular Activities*, 2014).

Conclusions

According to the primary teachers, who participated in the research, their students learn various strategies of the creation of a fictional text based on the elements of re-creation (reproductive creativity) and original creativity. Most often primary students learn to create a story, least often they learn to write a retelling.

The development of primary students' writing (text creation) skills should be a process of teaching/learning how to write, which is very well thought over by the teacher and which is consistently and purposefully organized. Nevertheless, referring to the data of the research, primary teachers working according to the curriculum of mother tongue education do not have enough time for the formation of students' text creation skills. We tend to consider the lack of time emphasized by the teachers as the possible lack of the didactic competences of the teachers themselves to work according to the system of mother tongue teaching/learning renewed after the restoration of independence and use the freedom to creatively plan and organize the educational process.

During the lessons of creative text writing, students must be taught how to write, must be encouraged to collaborate; they must be provided immediate help when they face writing difficulties. However, as it can be seen from the results of the research, only slightly more than a half of the teachers at least once a week give a lesson to form students' creative text skills and prepare students to create a text – they give a whole lesson on that and assign creative text tasks to students to perform them in the classroom.

It would be possible to state that the majority of teachers understand that the success of the performance of creative text tasks depends both on the teacher and the student. However, the fact that even less than a half of the research participants admit that their students like creative writing tasks

and only about one-third of the teachers are satisfied with the outcomes of their students' creative texts, raises doubts about the following abilities of teachers themselves: to prepare for a text creation lesson himself/herself, to assign preparation tasks to students, to structure the lesson/process of text creation, etc.

The presented results of the quantitative research only partially inform how the primary teachers of the town X of Lithuania organize the development of primary students' writing (text creation) at their mother tongue lessons. The results of the present research presupposed the perspective of our further qualitative research, i.e., to find out: 1) how the teacher prepares for a text creation lesson himself/herself, how he/she assigns preparation tasks to students and what kind of tasks it is, how he/she structures the lesson/process of text creation; 2) what students' opinion about text creation lessons is; in the students' opinion, what the necessary preconditions are for the formation of students' positive relation with creative text tasks and how teachers could enhance students' creative attitudes so that the outcomes of students' creative tasks could be better.

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THE INTEGRATION OF PROBLEM SOLVING AND VALUE APPROACH: THE SHIFT TOWARD HOW TO THINK

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ABSTRACT

The paper aims to reveal that values integration into problem solving fosters *how* to think. The first part of this paper discusses the meaning of a problem that influences the definition of problem solving. The second part discloses a structural process of problem solving and its weak points leading to rational *what* to think. Addressing the issues of why and how values influence decision-making that is a constituent of problem solving process, the opportunities for integration of values into problem solving are revealed. Stressing that problem solving integrating values is a significant way of future professionals learning, the framework of value-based problem solving is presented. Suggestions reveal the implementation for value-based problem solving learning and teaching as well as directions for future research.

Keywords: values approach, problem solving, how to think, what to think, future professionals.

Introduction

The advanced processes of globalization, digital and information technology pose new challenges for education and require to master comprehensive skills, capabilities, and competencies. However, universities provide learners with systematic knowledge, practical and analytical skills (Harland, Pickering, 2010). The latter allow learners to compete in the labor market, though only for a personal economic benefits. In this way, "intelligently obedient" (Thornton, 2004, 15) future professionals are formed. As Sternberg (2017) claims that currently the focus is on highly skilled "an educational race" (p. 3). Moreover, this race "does little to choose winners who will create a positive, meaningful, and enduring difference to our future" (Sternberg, 2017, 3). The question remains to what extent we want to let that our future will depend on the decisions that are made by professionals who have been "educated" on this basis. Ironically, that, for example, education for sustainable development (e.g. Salgado, Abbott, & Wilson, 2018) is get involved to teach certain competencies in reducing various consequences of problems solved by such professionals.

In contrast, higher education should enable learners to get understanding of themselves, of their relationships to others, to develop an ability to make proper moral and other judgments, and to act according them (Ozoliņš, 2015, 870). Barnett (2014) argues that such higher education highlights the connections between it and the development of an individual's mind, understanding, and of the learner's entry into a form of reasoning. Reasoning that is ethical and leads to an ethical conduct (Sternberg, 2009). Everyone should take their share of responsibility and contribute to the world, society, and self-creation through conscious and wise decisions (Zsolnai, 2008; Sternberg, 2017). This places emphasis on the potential of higher education to make a valuable contribution not by shaping market participants, but by educating professionals who are responsible for itself, for the society in which they are, and for the world.

Beghetto (2016) asserts that "the spatial borders have shrunk and macro-challenges have become personalized and quite literally placed in the palms of our hands" (p. 171). Such replacement underlines the need for a new thinking which directs acting. One of the possibilities becomes problem solving identified as the way of thinking (Binkley et al., 2012), reasoning patterns as deduction, induction or even abduction (Dorst, 2011). Currently problem solving is stressed as one of the key competencies necessary for future professionals (PISA, 2015; World Economic Forum, 2016). Some researchers (Jonassen, 2011; Cho et.al., 2015) suggest to incorporate it in every curriculum. While research from different disciplines deals with the development of certain problem solving abilities and/or competency (Jonassen, 1997; Ellspermann, Evans, & Basadur, 2007; Donovan, Guss, & Naslund, 2015; Fischer & Neubert, 2015; Collins, Sibthorp, & Gookin, 2016; Yener, 2016), little is known how future professionals could cope with problems, especially those that require value-based approach. Ethical issues encompassing values is more considered in decision-making (Keeney, 1994; Verplanken & Holland, 2002; Hall & Davis, 2007). Problem-based learning proposes to develop ethical and reflective competencies (Euler & Kühner, 2017) as well as to recognize and to apply moral values in daily activities (Kirkman, 2017). In fact, values should be spread within education in order to help learners to discover and to understand to what and how values mean in the broader framework of things (Ozoliņš, 2015).

To address the discussed gaps, the paper aims to reveal the integration of problem solving and values. On the basis of literature review method (Grant & Booth, 2009), this paper addresses several issues. First issue seeks to discuss the meaning of a problem and problem solving. Second, the author analyzes models for problem solving development and highlights their weak points. Third, the author explains the significance and influence of values when solving problems. For this purpose, the author designs

the framework of value-based problem solving. Finally, the paper discusses the issues of its limitation and implementation.

Trying to Grasp the Meaning of Problem Solving

Literature that examines problem solving calls for a discussion. One of the reasons is the definition of a problem. According to Dunker (1945; as cited in Mayer & Wittrock, 2006), a problem arises when a person has a specific purpose but does not know how to achieve it. However, this general definition represents a quite narrow view to a problem. Dostal (2015) argues that a problematic relation is not necessarily primarily based on the purpose of the person. Difficulties and internal uncertainty related to the arisen problem should also be taken into account. With reference to the classical definition, a problem is defined as the gap between the current and desired situations (Ellspermann, Evans, & Basadur, 2007). Jonassen (1997) argues that the problem domain, problem type, the problem solving process and a solution define problems.

Contemporary research extend this discussion by presenting various types of a problem: "complex" (Fischer & Neubert, 2015; Herde, Wustenberg, & Greiff, 2016), "well-structured" and "ill-structured" (Basadur, Ellspermann, & Evans, 1994; Jonassen, 1997; Ellspermann, Evans, & Basadur, 2007), etc. Such abundance of types only confuses. As Funke, Fischer, & Holt (2018) point out that often some of these terms lose their essence. For example, when complex and ill-structured problems share many similar features, clear borders between such terms are blurred.

Though to define the problem various terms is used, all attempts reflect the parameters of the classical problem's definition where the problem consist of the initial state, the desired end of the solution (or goal state) and paths searching for the solution (see Figure 1). Thus, the differences between the variety of the problem's types that influence their definitions could explain the first two above-mentioned parameters. Similar ideas can be found in Wood's (2006) classification of eight problem types. The data (as the initial state) and the goal determine choose of the methods for how to solve a problem as well as how to evolve the development of different capabilities. In other words, this leads to exploring a variety of paths for solving problems and focuses on the process of searching for the solution.

In view of this, problem solving seems to be a "general term" (Csapo & Funke, 2017, 20). A wide field of research highlights the absence of consensus in the theoretical understanding of what problem solving is. However, Csapo & Funke (2017) claim that such forms of problem solving like domain-specific and domain-general as well as analytic and complex, are well defined. Despite some differences, there is an agreement that

problem solving is a cognitive process (Jonassen, 1997; Mayer & Wittrock, 2006), difficult and demanding activity (Raven, 2000). Jonassen (1997) stress that problem solving "as activity is more complex than the sum of its component parts" (p.66). The complexity is emphasized by the fact that problem solving involves motivation and an emotional component (Jonassen, 1997; Dostal, 2015; Funke, Fischer, & Holt, 2018)). Neuroscience research (Zull, 2004) supports the later issue. Emotions and thoughts are physically intertwined: particular cognitive experience is connected with particular body feeling and influence motivation. In reference to foregoing, problem solving obviously has considerable educational potential.

The Models for Problem Solving Development

From educational point of view, a problem "is understood as a difficulty of theoretical or practical nature that causes an inquiring attitude of a subject and leads him/her to the enrichment of his/her knowledge" (Kupisiewicz, 1964; as cited in Dostal, 2015, p. 2799). This definition highlights the learning through problem solving. Learning takes place by finding the space between the known and the unknown. This space is filled with acquired knowledge, skills, and experiences leading to a certain competency.

Stanic & Kilpatrick (1988; as cited in Schoenfeld, 2016) presents several topics of how problem solving is used for teaching purposes. Although authors discussed problem solving in mathematics teaching, it is worth to pay attention, as these topics are widely used in different fields of science. The first topic indicates problem solving as context where problems are applied as the means to achieve of other curriculum goals. Teaching of problem solving is minimal, as learner performs the stated tasks. The second topic represents problems solving as skill, yet narrowly defined as "being able to obtain solutions to the problems assigned" (Schoenfeld, 2016, 5). Therefore, such skill is worth to teach in its own right. Mostly various methods of problem solving are taught within subject matter and practicing stated problems so that the methods can be mastered. These two above mentioned topics typically are used in problem-based learning and case-based learning. In contrast to the former two, the final topic emphasizes problem solving as an art where the real-life and challenging problems are employed. Undoubtedly, this topic is more reasonable for teaching and learning of problem solving.

In fact, problem solving is indicated as one of the most meaningful and important ways of learning (Jonassen, 1997). However, its education is one of the greatest challenges (Mayer & Wittrock, 2006). Highlighting problem solving as one of the core competencies required for future professionals
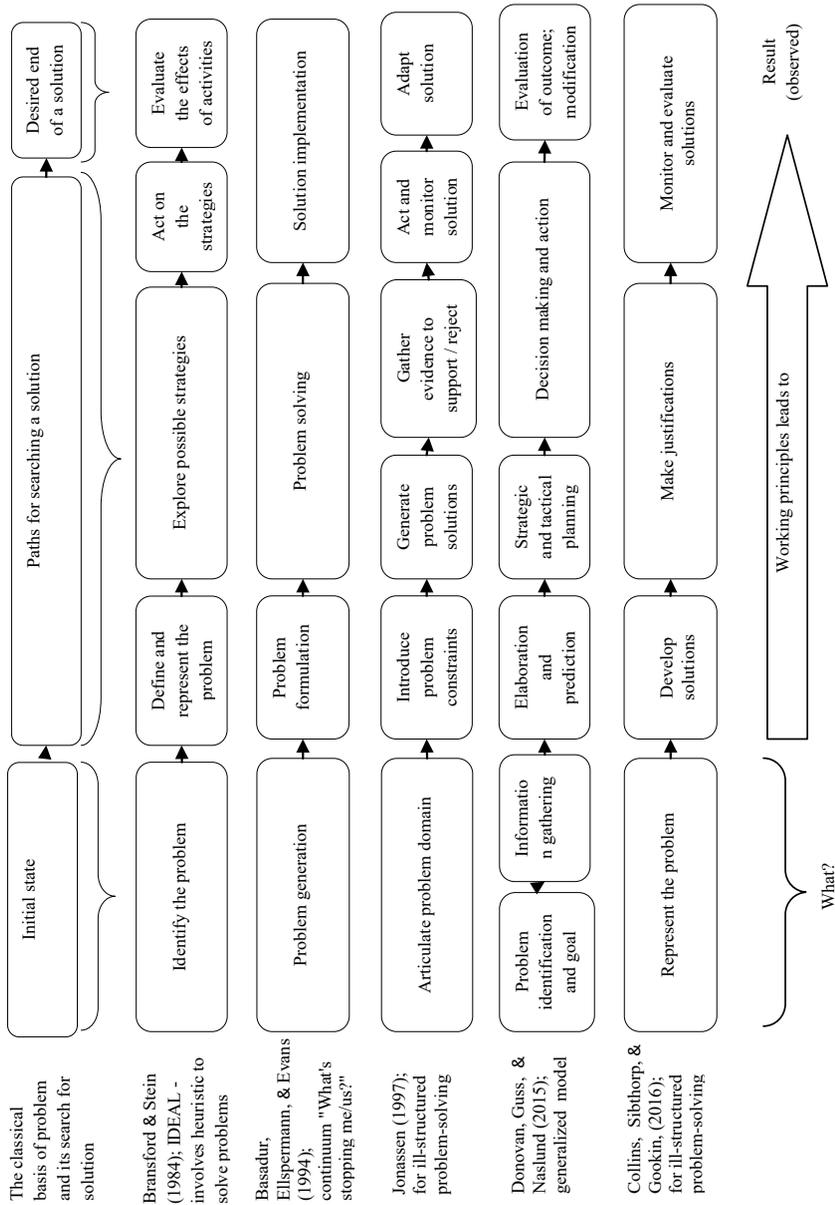
Figure 1. The steps of the problem solving process: different approaches (on the basis of Basadur, Ellspermann, & Evans, 1994; Jonassen, 1997; Dorst, 2011; Schunk, 2012; Donovan, Guss, & Naslund, 2015; Collins, Sibthorp, & Gookin, 2016)

(PISA, 2015; World Economic Forum, 2016), models for its development are sought (see Figure 1). The authority of rationality in the problem solving paradigm (Korte, 2003) clarifies likeness of the logical and even stylish structure of these models. Problem solving researchers have different representations about what is the basis for solving a problem. Although each model presents certain steps, they all share the same intention: a search for the solution from the initial state to the desired state.

Such classical approach to problem solving underlines the procedural process of problem solving and supports a rational approach. After identification of the problem, a problem solver jumps into generation of alternatives. In this case, focus is on the problem, not on its understanding and the problem itself directs the whole solving process. When the problem solver pays less attention to the analysis of the problem, its thorough understanding is limited. As a result, the problem solver could solve the wrong problem in the right way to some extent. The right way means that the problem solver employs usual way to solve problems which Dorst (2011) called deductive reasoning. The problem solver knows the "what" (an initial state) and working principals (paths searching for the solution). For this reason, the problem solver can predict results (desired end of the solution) which are often more or less convenient for the problem solver. Such problem solving process concentrates on what to think. Hence, the problem solver creates a script pattern of how to act in a similar situation. However, the similar situation is not the same one, as in each situation the context, participants, stakeholders, circumstances, factors and other features will be different. Clearly, a script pattern does not fit for all events the problem solver encounters.

Duch, Groh, & Allen (2001) stresses that the essence of problem solving is to acquire various experiences and to create cognitive strategies that could be used in the future. What is more, learning process is significant in problem solving, not just outcomes of such learning (Duch, Groh, & Allen, 2001; Yener, 2016). Problem solving as learning from the problem solver requires more than only possessing certain knowledge and operational skills. The insufficient development of problem solving abilities (PISA, 2015) discloses a shortage of use only the rational approach to problem solving. Thus, the emphasis should be put on how to think when solving problems. This means to learn to solve the right problem in the right way. Such an opportunity for problem solving suggests values approach.

Problem solving integrating value approach

Values integration into problem solving fosters the way of how to think. However, first is necessary to clarify one subject. Problem solving

and decision-making are presented as separate processes. Therefore, these processes share quite similar steps. According to Huit (1992), this could explain why terms of problem solving and decision-making are sometimes used interchangeably. The unification of different processes is misleading position. Decision-making is a selection process where one from several possible solutions is chosen to reach a desired state (Huit, 1992). Meanwile, problem solving is "a process in which we perceive and resolve a gap between a present situation and a desired goal, with the path to the goal blocked by known or unknown obstacles" (Huit, 1992, 34). Indeed, decision-making is a part of problem solving.

While decision-making through ethical issues encompass values, values are like forgotten theme in problem solving. Nevertheless, values can offer reasonable reinforcement for problem solving. Researchers (Schwartz, 1992; Halstead, 1996; Verplanken & Holland, 2002; Argandona, 2003; Roccas, Sagiv, & Navon, 2017) claim that values guide and affect personal behavior encompassing the ethical aspects of solutions. Further is discussed how this influence manifests. According to Halstead (1996), values are – principles, fundamental convictions, ideals, standards or life stances which act as general guides to behaviour or as points of reference in decision making or the evaluation of belief or action and which are closely conected to personal integrity and personal identity (p.5).

This comprehensive definition of values brightens the issue. Like others researchers (e.g. Schwartz, 1992; Argandoña, 2003), Halstead's (1996) definition highlights the influence of values on decision-making. Such the emphasis also makes clearer why decision-making models are more concerned with values than problem solving. Further, by applying values as "normative standards to judge and to chose amongst alternative modes of behaviour" (Schwartz, 1992, 2), the significance of values for alternatives and their evaluation in problem solving is revealed. Keeney (1996) considers values as the core criteria for evaluating the desirability of any alternative leading to the desired solution. Thus, values help to create worthier alternatives as well as to evaluate them. Moreover, values encompass the future consequences of the solution. When searching for a solution, the goal is necessary. As Keeney (1996) represents decision-making approach, he underlines that starting point for decision-making process are values primary expressed in the goals. Skimina, Cieciuch, & Strus (2018) assert that values reflect the content of the goals. On the whole, values represent the essential foundation for problem solving and could be integrated into it by several ways (see Figure 2).
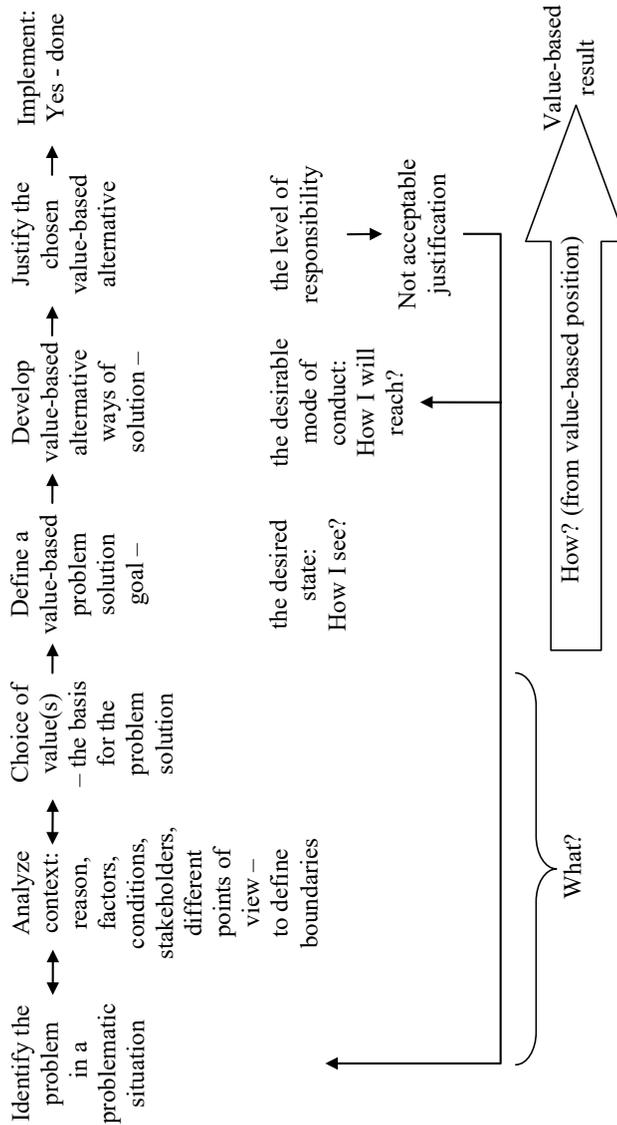
Figure 2. The framework of value-based problem solving

Based on above mentioned assumptions, the Figure 2 presents the framework of value-based problem solving process. This process integrates main steps of problem solving, decision-making and value approach. The first step encompasses the recognition of a problematic situation trying to identify where a problem is and to name it. The second step emphasis the thorough analysis of the identified problem in its context.

These first two steps allow the problem solver to draw a comprehensive picture of the problem in pursuance to understand it. During such „conversation with the problem" (Raven, 2000, 479), the problem solver aims to clarify the nature of the problem and potential directions for a solution. Hence, the analysis of the context helps to define boundaries of attention (Hester & MacG, 2017). These boundaries encompass values that according to Hester & MacG (2017) are one of the salient qualities of the context and guide the attention of the problem solver into the analyzed problem. The third step requires to choose value (or several) that will help to solve the problem and guide the search of a desired solution. The goal as the desired state based on chosen value (or several) is set in the fourth step. This goal requires answer to the question "How I see the desired end of a solution?". The creation of alternative ways leading to the desired solution is in the fifth step. The established goal represents the main criteria for the creation of alternative ways. Further, created alternatives should reveal the desirable mode of conduct answering to the question "How I will reach the desired end of a solution?". The justification of the chosen alternative way is in the sixth step. As Zsolnai (2008) argues, the perceived responsibility essentially determines the choice. Thus, the chosen alternative way represents what level of responsibility the problem solver takes on when solving the problem. If justification reveals meaningful search for the desired solution in all respects (as mentioned in the analysis of context), the problem solver will proceed with its implementation. In contrast, the problem solver backs to the creation of the alternative ways for a solution, or even to the analysis of the problem. Overall, the presented process requires paying more attention to the analysis of the problem. The path for a solution becomes more complex and hardly predictable. However, values guides overall process, not the problem itself and such the process represents the shift from what to think to how to think.

Discussion

While education of certain values faces challenges with their internalization (Yazdani & Akbarilakeh, 2017), research in value-based education (Kirschenbaum, 1992), problem-based education (Kirkman, 2017) encourage educators to help learners to identify values, to think about them and to develop higher levels of moral reasoning. Problem solving integrating values could be helpful to foster meaningful learning and to promote the development of the capabilities of problem solving and moral reasoning along with responsibility. Mastering these capabilities learners could transfer what their have learned into various situations of their professional and personal life.

Duch, Groh, & Allen (2001) consider problem solving as an internal psychological process. Such process during learning leads to a physical change in the brain which enables learner's self-construction process (Duch, Groh, & Allen, 2001; Zull, 2003). The introduced value-based problem solving process fosters self-construction process of the problem solver through "four core pillars of learning" (Zull, 2003, p.). First, the problem solver gets information during analysis of the problem and its identification. Second, makes meaning of this information when choose the value (or several) and sets the goal. Further, when creates alternative ways for a solution and justify the chosen alternative, the problem solver creates new ideas from these meanings. Finally, the implementation of the chosen and justified alternative represents acting on those ideas. Moreover, such self-construction process forms the problem solver's character which according to Argandoña (2003), gives a consistency to subsequent decisions.

The implementation of introduced problem solving integrating values could be a challenge for educators. For teaching and learning purposes, this framework could be incorporated into curriculum. One possibility is to integrate this framework into a particular module / course of the social science curriculum. The minimal criteria for such module /course could be as follows: supports multidisciplinary approach; includes life-problems solving activities; applies flexible teaching/learning methods; fosters moral and ethical issues. The particular module / course provide changes that involve the development of theoretical aspects of problem solving and values. In order to reveal how the learners have mastered the theoretical framework, it can be verified in practice, i.e. the learners solve a problem presented by teachers or chosen by the learners themselves. Another possibility is to design a new specific module / course based on this theoretical framework. Therefore, this possibility is more challenge and requires relevant competences of the teachers.

This problem solving integrating values could serve as a teaching tool in problem-based learning and case-based learning. Trying to promote learning, several issues need to be considered. First, problem-based learning and case-based learning use prepared cases. The main weakness of these cases is that learners analyze them through the lens of a third person. According to Kirkman (2017), this is a detached point of view. To change such view, author suggests to use problem situations, which "take the focus of a second-person narrative calling for a first person respond". Moreover, problem situations contribute the creation of more than one alternative and how each alternative might be implemented referring to values. Second, problem solving as an art (Schoenfeld, 2016) should be fostered. Potentially, the whole process of problem solving integrating values could

enable learners to learn to create the meaningful and responsible attitude to their life.

Regardless of that, the complexity of problem solving integrating values represents its limitation. This process is long enough and requires learners' effort, time, and motivation. To take advantage of these resources is worth as Kirkman's (2017) findings show that becomes "impossible not to attend to values" in various situations when a person learned to think about and noticed them.

Conclusions

From the perspective of education, problem solving integrating values provides the problem solver with a tool that enables the development of value-based problem solving capability. While the introduced framework consists of six steps, distinct capabilities are developed in each step. The problem solver is enabled to develop the perception of the problematic situation and to identify the problem (the first step) as well as to make a thorough analysis of the context where problem emerged (the second step). Problem solver develops a capability to choose a value as the background for the solution (the third step) and to formulate the value-based goal of the solution as the desired result (the fourth step). During the fifth step the problem solver develops the capability to create value-based alternatives highlighting a process which reveals how to search the solution. Finally, problem solver learns to make sound justification which is the rationale for problem solution (the sixth step). Moreover, during value-based problem solving process the problem solver bases his values twice (first time in the third step when defines a desired state and second time in the fourth step when decides on the desirable mode of conduct).

Future research could cover the verification of the introduced framework for problem solving integrating values. First possibility is concerned with incorporation of this framework into curriculum. The creation of educational environments for the development of value-based problem solving capability is encouraged seeking meaningful incorporation. Second, it could be reasonable to use this framework as innovative activity which fosters learning and the development of variety capabilities, for example, during problem-based learning and case-based learning.

Given the fact that problem solving is expected to be incorporated into every curriculum, to foster the practice of problem solving which integrates values is necessary. Especially if we find agreeable that the young generation should and could have a thorough approach how worthwhile to solve problems and to reason from values point of view.

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NATIONAL LEVEL LARGE-SCALE ASSESSMENT DATA FOR INSTRUCTIONAL PLANNING IN CLASSROOM

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ABSTRACT

Large scale assessments are used for many purposes, but for all purpose's teachers are rarely recognising the use of large-scale assessment for instructional planning. The feedback from large scale assessment very often is too abstract and of no use to the students, especially if the large-scale assessment is administrated in the end of term. Teachers primarily use their intuition to plan instructional decisions, however in time of vast different political initiatives, it is very important to introduce in school data-driven decision making.

Authors are working in the theoretical framework that assessment data in aligned and interconnected fashion with instruction is important in making high quality educational decisions and data should be interpreted in context to be transformed to the meaningful information. The study design is based on in-depth analysis of 6th grade national level large-scale assessment data in Science, Native language (Latvian language) and Mathematics and teacher performance data in classroom. In focus groups experts deconstructed the aggregated data from the large-scale assessment in several iterations and map items according to the theoretical constructs according to new curriculum reform. Data have been analysed according to the general framework of data-decision making. Authors have found, teacher performance data and deconstructed large-scale assessment data, organized in interconnected way between different subjects, of high use in data driven decision making process. The authors have piloted the model, in which deconstructed data were used to make decisions to improve student learning outcomes in classroom.

Keywords: large-scale assessment, data-driven decision making, data literacy.

Introduction

Employment distribution over the last years has shifted towards jobs with non-routine skills. High cognitive skills encompass problem-solving, abstract reasoning, and decision-making, but low cognitive skills demand basic human adaptability (Dorn, 2009). Therefore, education systems

shift to the implementing and promoting higher order thinking skills in curriculum. Countries are trying to their best to improve the quality of education (Wiliam, 2018a). Similar process is observed in Latvia, where National Centre for Education has launched a comprehensive curriculum reform, prioritising 21st century skills such as problem solving and critical thinking, collaboration, citizenship, creativity and entrepreneurship, digital literacy and self-regulated learning. The content of the curriculum has been organized in seven learning areas: languages, social sciences, cultural understanding and artistic self-expression, natural sciences, mathematics, technology, and health and physical activity with complex learning outcomes which integrates understanding, skills and attitudes (Regulations Regarding the State Standard in Basic Education, the Subjects of Study Standards in Basic Education and Model Basic Educational Programmes, 2018).

However, question remains, what education policy will improve quality of education, because even the robust research results, using randomized controlled trials still tells us only half of the story. The research results are talking about what has worked in the particular time, place and certain population together with support factors which were in place in that particular place in time, that's why the context of the education policy is of such importance (Cartwright & Hardie, 2012). Especially in time of vast different political initiatives, it is important to introduce in school data driven decision making to evaluate effectiveness of every initiative in specific context, because research shows that even feedback to student can in fact reduce the student achievement (Kluger & DeNisi, 1996).

In the research literature through the randomized and quasi-experimental designs is growing promising evidence that using data can lead to the improvements of student achievements (Campbell & Levin, 2009). Data decision making has become important theme linked to school accountability, improvement and educational policy (Mandinach & Jackson, 2012). Two significant changes, which facilitates data use, have occurred. Firstly, the shift on the paradigm of assessment from summative to formative, with the goal to directly use information in improving instruction. Secondly, various technological solutions to manage vast amount of data (Lipton & Wellman, 2012).

School teams, which attempt to use data in a meaningful way, often face several problems during their work with data, both on the individual level (for example, personal and social) and as whole group (for example, technical tools, sharing the same goal and group interdependency). It is a big mindset change for teacher, when workplace association moves from classroom to school. Structural change doesn't ensure cultural change, that's why simply providing time to the group meeting, doesn't increase teacher learning (Lipton & Wellman, 2012).

Everyday teachers and school principals are making decisions, which directly or indirectly impact student learning. The view that teachers and principals do not need data, because good decisions are based on experience are prevailed (Schildkamp, Lai, & Earl, 2013). However, there is growing evidence that effective data use strategy improves student achievement. But use of data requires understanding what kind of data is needed and how it will be used (Datnow et al., 2007).

A key reason why data can lead to the improvements is the opportunity to monitor if students are reaching their goal and plan intervention on the fly. Second reason for using data is finding the most effective and cost-effective pollicises and practices in certain context, which improves student achievement. It is very similar idea about knowing the impact from the teacher perspective, which is relevant not only for the individual teacher, but also to the school as an organization (Hattie, 2012).

Unfortunately the question of "what work" in education can hardly be answered, most often it is very dependable of situation and circumstances (Macpherson & Hendrick, 2019). Therefore, organisation's learning capability and seeking for the most effective solutions will be the only sustainable competitive advantage in the future. It is difficult to image that if teachers are not continuous learners and effective collaborators, they will be able to develop such qualities in students (DuFour, 1997; Kools & Stoll, 2016).

General Data Driven Decision framework

Data driven decision making in education typically refers to teachers, principals, and administrators systematically collecting and analysing data to guide a range of decisions to help improve the success of students and schools (Schildkamp u.c., 2013). A use of data has become a strong part of educational policy in the school, district and national level. Researchers have been developed various theoretical frameworks for data-driven decision making (Abbott, 2008; Hamilton et al., 2009; Ikemoto & Marsh, 2007a; Mandinach et al., 2008; Means et al., 2010; Schildkamp et al., 2013).

According to the Schildkamp the process of using data is like the linear process: starting from the purpose and then proceeding to data collection, analysis, interpretation and action. Howt the same time Schildkamp points out that there are some iterations and connections between the data collection, analysis and interpretations (Schildkamp et.al., 2013).

Ikemoto and Marsh argues that making data-driven decision simple and straightforward process, we are failing to acknowledge how educators make meaning of the data (Ikemoto & Marsh, 2007b). There are evidence,

that models which are implemented, differ from straightforward and linear process. The variations are so great, that on one extreme for every problem is introduced the same solution (for example, allocating additional instructional time) to the models which really are capable of finding causality (Ikemoto & Marsh, 2007b). According to the Ikemoto and Marsh there are at least four types of data-driven decision making: basic, analysis-focused, data focused, and inquiry focused. Data complexity depends on time, type and level of details, while analysis complexity varies for according to the technical analysis, iterations and expertise (Fig. 1). Distinction is important to understand that under the word "data driven based decision making" has been understood very different practices. Although there is no clear prioritising complex versus basic data or analysis, because the purpose of collecting and using data can be very different. According to Copland (2003), inquiry based analysis is of favour, because it is not only a way for solving problem, but also a way of an organization learning and capacity building (Copland, 2003).
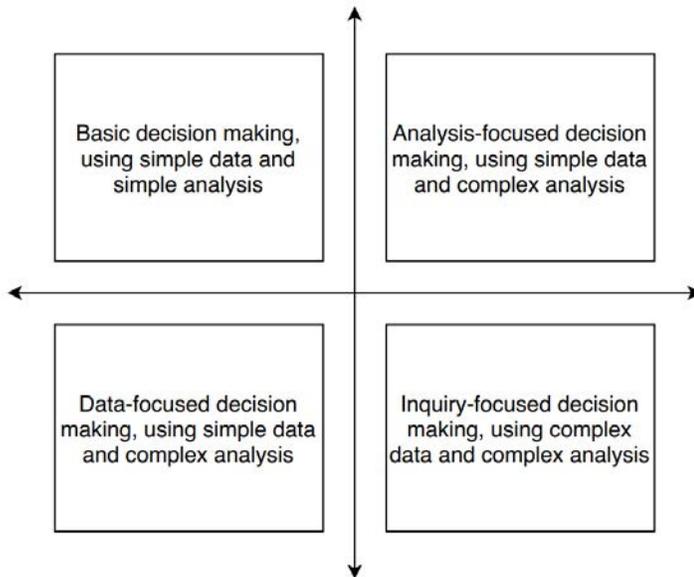
Figure 1. Four types of decision making, using different types of data and implementing different types of analysis. From "Cutting Through the "Data-Driven" Mantra: Different Conceptions of Data-Driven Decision Making," by G. S. Ikemoto and J. a. Marsch, 2007, *Yearbook of the National Society for the study of Education, 106*. Copyright 2007 by the Blackwell Publishing. Adapted with permission. Yearbook of the National Society for the study of Education by National Society for the Study of Education Reproduced with permission of Blackwell Publishing in the format Republish in a journal/ magazine via Copyright Clearance Center

In the article "A Perfect Time for Data Use: Using Data-Driven Decision Making to Inform Practice," Ellen B. Mandinach (2012) describes a conceptual framework for data-driven decision making and claims that, despite of growth of theoretical frameworks in literature, they consist of similar components: data, information and knowledge. However, in her presented framework, data driven decision making components are supplemented with cognitive skills which are needed to transform data. In order to transform raw data to knowledge, six relevant skills are outlined and embedded in conceptual framework: collecting and organising data, analysing and summarising information, synthesising and prioritising knowledge.   The presented framework is not linear, but is based on the iterative process, where in the last phase the intended impact of intervention or proposed solution has been measured, which most likely leads to next steps of collecting another types of data and different analysis strategies (Mandinach, 2012).

In all general data-driven decision making frameworks, the question remains what type of data is available to teachers or school, how should it be organized in actionable way, not to be the burden, but be of use to instructional decisions or improvement planning in the level of school (Mandinach, 2012).

Development of the Specific Data Driven Decision-making Framework for School Improvement

Student educational achievements as a separate piece of information is of no use, because mostly people want to know whether the results are good or not good, and if not good whom to blame, and how to fix whatever is broken. For that we need not only student learning outcomes data, but additional educational, policy and non-educational data, because the impact of these context and non-educational factors can be huge. When school performance is good, the reason is most likely both – quality of education and non-educational factors influence. And it is not easy to understand and figure out which is influence more, but it is very important to include such factors in the framework (Koretz, 2008, 2017).

According to the research the first and most important factor is teacher quality, although there are some critics for the research methodology, the conclusions about teacher quality as a main factors has been proved over and over worldwide (Hanushek, 2011; Wiliam, 2018b). The second most important factor is leadership, which have been studied extensively and the research is clear, that primarily talented leadership serves as a catalyst for developing the potential of the organization. Leadership effect is second

only to the teacher quality (Day, Gu, & Sammons, 2016; Hallinger, 2014; Hallinger & Heck, 1998; Leithwood, Harris, & Hopkins, 2008).

In previous research authors have developed framework to report assessment data on actionable scale for school and teacher (Table 1). For the identification of the level of complexity of item Structure of Observed Learning Outcomes (SOLO) taxonomy has been used (Biggs & Collis, 1982; Pestovs, Namsone, Čakāne, & Saleniece, 2019). Authors have modified the original SOLO taxonomy, additionally dividing the second level of complexity. The II level of complexity has been divided into two groups by varying item context. When the context is familiar to the student, the item has been mapped as IIA level and unfamiliar new context has been mapped as IIB. Average student performance in classroom and school level has been calculated and compared with national level.

Table 1. Student achievement reporting framework in Mathematics, Science and Native language (Latvian language) according to the subcomponents and SOLO level of complexity

Subject	Subject subcomponents	SOLO level of complexity				
		I	IIA	IIB	III	IV
Mathematics	Model/formulate					
	Transform/manipulate					
	Infare/draw conclusions					
	Communicate					
Scientific	Explain phenomena scientifically					
	Interpret data and evidence scientifically					
	Evaluate and design scientific enquiry					
Language	Language conventions					
	Retrieve explicitly stated information					
	Interpret and integrate ideas and information					
	Communicate					

Aim of the Study

The aim of the study is the development of the initial framework for making data-driven decisions and piloting the framework at school level, using one, the most important key factor – teacher instructional quality and 6th grade national level large-scale assessment data in Science, Native Language (Latvian language) and Math as a student achievement indicator.

Materials and Methods

Authors reviewed several general data-driven decision theoretical frameworks, adapted theoretical framework of the key factors, which influences the student learning outcomes and present an effective way of collecting, and organizing data, analysing and summarizing information and synthesizing and prioritizing knowledge to decide and develop action plan for school improvement. In the developed theoretical framework, key educational factors are included, including students' background data and characteristics (Fig. 2).
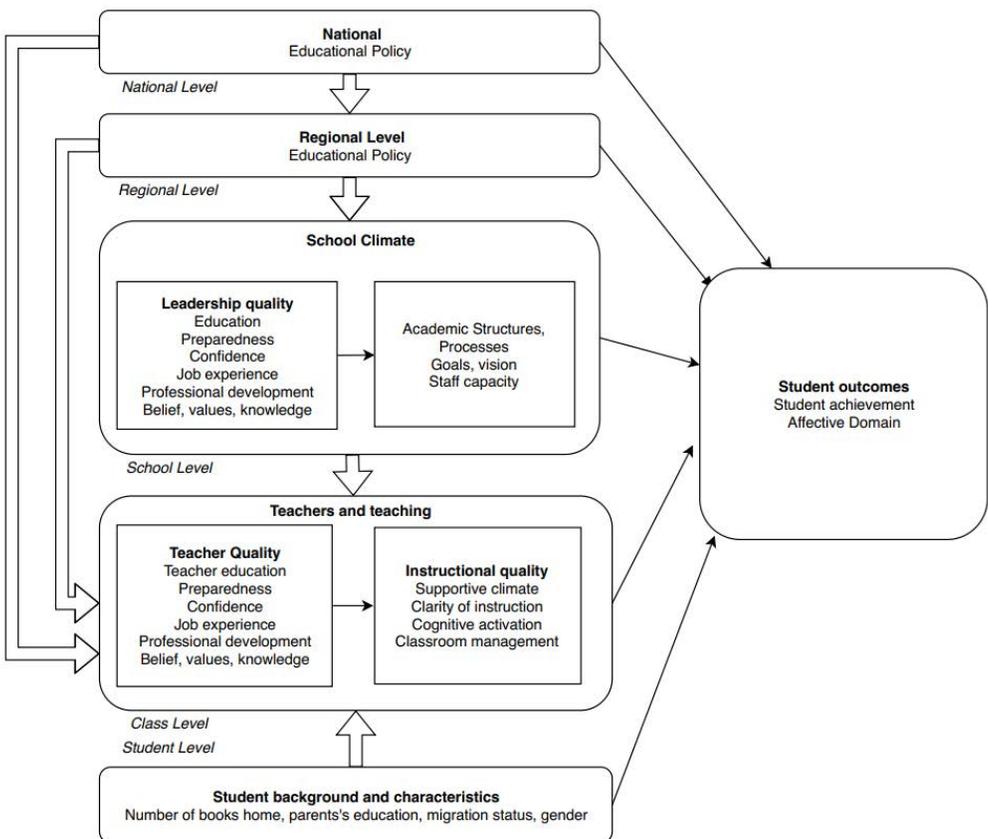
Figure 2. Conceptual framework of main factors of student learning outcomes. From "Teacher Quality, Instructional Quality and Student Outcomes: Relationships Across Countries, Cohorts and Time. IEA Research for Education. Volume 2.," by T. Nilsen & J. E. Gustafsson, 2016, *International Association for the Evaluation of Educational Achievement.* Copyright 2016 by the International Association for the Evaluation of Educational Achievement (IEA). Adapted with changes under the terms of the Creative Commons Attribution NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/)

1. According to the previously developed framework, authors identify assessment indicators in the national level large-scale assessments in the 6th grade in Science, Native language (Latvian language) and Mathematics of the Year 2019. Assessment indicators are mapped according to the framework subcomponents and according to the SOLO level of complexity of item. Average achievement results in the classroom and at national level have been calculated, using classical test theory in *R 3.6.0.* and *Microsoft Excel 365* environment.

2. In order to gather data of the instructional quality, a previously developed framework has been used to observe teacher performance in classroom. Designed and piloted teacher performance assessment framework for teaching 21st century skills, includes 8 categories and 13 criteria. According to the theoretical framework, performance level descriptions have been created and validated in the school practice, to assess the performance of teachers. Performance has been described in four levels: from the 0 (not observed) to the 4 (expert performance) (Bertule, Dudareva, Namsone, Cakane, & Butkevica, 2019). In this study three categories and nine criteria have been used during the lesson observation (Table 2). The teacher performance, who are teaching in the 6th grade have been analysed in depth, but for school leadership average observed teacher performance in school has been provided in addition.

Table 2. Teacher performance assessment categories and criteria to teach 21st century skills (Bertule, Dudareva, Namsone, Čakāne, & Butkēviča, 2019)

Category	Criteria	Levels of performance				
		0	1	2	3	4
Cognitive activization	2.1 Learning task for cognitive depth					
	2.2 Classroom discourse					
Classroom management and clarity of instruction	5.1 Lesson design					
	5.2 Teaching techniques					
	6.1 Curriculum					
Student support	1.1 Learning goals					
	1.2 Metacognitive skills					
	5.3 Differentiation, personalization					
	6.2 Feedback					

3. In the research participated two municipalities (seven and eight schools in each municipality). In this paper data from one school (three classes) are studied as case study, in order to begin the piloting of developed model. Authors together with leadership team, identified specific patterns according to the school data, which included average achievement data in the 6th grade in Science, Native language (Latvian language) and Mathematics of the Year 2019 and performance of teachers' group (number of teachers = 6).

Results

In the case study, student achievement average data are presented for every 6th grade class (three in total) in one municipality school, according to the Table 1 framework. The total student population in municipality is approximately 700 students.

Table 3. Student achievement average data and difference from national level average according to subjects and level of complexity. Municipality School. Grade 6.1

Subject	Subject sub-components	Average student achievement and the difference with national level student achievement across the country							
		I		IIA		IIB		III	
		%		%		%		%	
Mathematics	Transform / manipulate	63.1	-14.3	72.7	-2.4	28.4	-15.2	35.5	-5.3
Science	Explain phenomena scientifically	73.7	-2.2	57.9	-9.3	27.6	-22.3	21.1	-17.9
	Evaluate and design scientific enquiry	94.7	14.5	na	na	39.5	-14.2	na	na
	Interpret data and evidence scientifically	na	na	68.4	-5.7	68.4	12.1	39.5	1.4
Latvian Language	Language conventions	58.2	-9.5	40.9	-28.6	20.3	-22.0	na	na
	Interpret and integrate ideas and information	70.7	-1.3	83.0	16.0	59.1	3.5	13.6	-18.9

Table 4. Student achievement average data and difference from national level average according to subjects and level of complexity. Municipality School. Grade 6.2

Subject	Subject subcomponents	Average student achievement and the difference with national level student achievement across the country							
		I		IIA		IIB		III	
		%		%		%		%	
Mathematics	Transform / manipulate	52.5	-24.9	67.0	-8.1	29.4	-14.2	29.0	-11.7
Science	Explain phenomena scientifically	60.8	-15.1	52.5	-14.7	31.3	-18.7	27.5	-11.5
	Evaluate and design scientific enquiry	85.0	4.8	na	na	35.0	-18.7	na	na
	Interpret data and evidence scientifically	na	na	60.0	-14.1	35.0	-21.4	30.0	-8.1
Latvian Language	Language conventions	60.9	-6.8	46.7	-22.8	42.3	0.1	na	na
	Interpret and integrate ideas and information	66.0	-6.1	80.4	13.5	54.9	-0.6	23.9	-8.7

Table 5. Student achievement average data and difference from national level average according to subjects and level of complexity. Municipality School. Grade 6.3

Subject	Subject subcomponents	Average student achievement and the difference with national level student achievement across the country							
		I		IIA		IIB		III	
		%		%		%		%	
Mathematics	Transform / manipulate	64.7	-12.7	69.4	-5.7	30.9	-12.7	24.7	-16.0
Science	Explain phenomena scientifically	72.8	-3.1	63.2	-4.0	26.3	-23.6	26.3	-12.6
	Evaluate and design scientific enquiry	79.0	-1.3	na	na	31.6	-22.1	na	na
	Interpret data and evidence scientifically	na	na	63.2	-10.9	36.8	-19.5	29.0	-9.1
Latvian Language	Language conventions	59.0	-8.7	63.2	-6.4	49.3	7.1	na	na
	Interpret and integrate ideas and information	65.1	-7.0	82.9	15.9	62.2	6.6	50.0	17.4

During the analysis of the national level large scale assessments of Year 2019, the authors couldn't identify assessment items in several subject subcomponents and items, which assessed SOLO IV level of complexity. The minus symbol represents, that the average achievement level of the class is below the national achievement level.

Table 6. Science, Mathematics and Native language (Latvian language) 6th grade teacher performance level. Municipality School. Grades are indicated

Teacher Code	Subject/ grade	Student support				Cognitive activization		Classroom management and clarity of instruction		
		1.1.	1.2.	5.3.	6.2.	2.1.	2.2.	5.1.	5.2.	6.1.
114	Native language / 6.2, 6.3	1	0	0	1	1	1	0	1	1
115	Science / 6.1, 6.2, 6.3	0	0	0	1	0	1	2	1	1
116	Native language / 6.1	1	0	0	0	1	1	1	1	2
118	Mathematics / 6.1	1	0	0	1	0	1	2	1	1
120	Mathematics / 6.3	3	2	2	2	3	3	3	3	3
122	Mathematics / 6.2	1	0	1	1	0	1	2	3	2

Average performance of the teachers in the school is presented according to the three categories and eight criteria (Fig. 3). The categories and criteria are the same, as discussed in the theoretical framework (Table 2). The maximum scale of the presented diagram is 4, as has been described the level of an expert. Acceptable level of performance is 3, where teacher performance, according to the framework has been described as proficient.
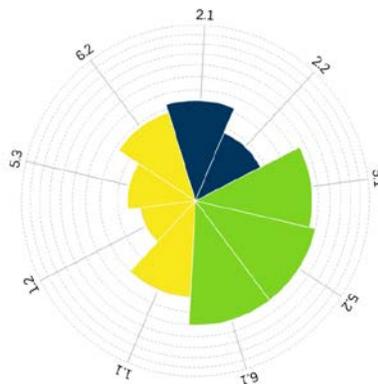
Figure 3. Average performance of observed teachers (number = 6) according to the three categories and eight criteria for the developing 21st century skills

Authors point out that for this teacher group strength is the category of classroom management and clarity of instruction, which includes lesson design, teaching techniques and curriculum, which is suitable to the student. The performance on three criteria in other two categories is insufficient: classroom discourse, differentiating and student metacognitive skill development.

Development of the school action plan most likely are based on the criteria, where has been observed as most problematic. Firstly, insufficient Science teacher performance (dominating Level 0 and Level 1) has been identified in category of classroom management and clarity of instruction during study. Average class achievement compared to national average also signalizes the problem. In such case personalized feedback is needed, to improve lesson design, teaching techniques and implemented curriculum. For Mathematics and Native language (Latvian language) teacher professional development mostly is associated with cognitive activization, more productive task development and classroom discourse improvement.

Conclusions

As every study, this study also has a limitation. Authors point out that, there have been not identified assessment items in all subject subcategories and different SOLO levels of complexity. Some subject subcomponents consist of only several assessment items, which lowers the reliability of results.

Most schools are data rich, but the challenge remains in selecting and analysing the right data to transform it to knowledge. Most often student assessment data has been integrated in the data driven decision making, but these kinds of data don't point out the solutions, often it is only signalizing the problem.

Authors during the research have piloted an initially developed model in which general steps of data driven decision making have been linked to the theoretical framework, where key factors, which influence student achievement have been identified and teacher instructional performance quality has been assessed in this study, with the previously developed teacher performance assessment instruments. Using the developed model, it is possible to identify the weaknesses and strengths of the observed teacher group.

For further research it is necessary to empirically validate the initially developed model. Develop and empirically validate assessment instruments for the key factors (leadership practices, student background and characteristics, national and municipality level policy), which are

influencing student outcomes and evaluate and measure the impact and effectiveness of developed action plan for the school improvement.

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FINE MOTOR SKILLS DEVELOPMENT IN PRESCHOOL-AGE CHILDREN WITH SPEECH AND LANGUAGE DISORDERS

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ABSTRACT

Children with speech and language disorders are characterized not only by the unique development of the speech but also by specific characteristics of cognitive and sensory motor skills. The research was based on the theoretical recognitions about the specific characteristics of child development in case of speech ontogenesis and dysontogenesis. In order to specify the development level of fine motor skills of the children, the same diagnostic activities were used that usually are used by the teachers-speech therapists in order to check the speech and language development of the children, as well as the cognitive and the motor abilities. In addition, the speech and language development of the children was checked.

Participants of the research were the pre-school age children with different speech and language disorders, ages 3 to 6, totally 27 respondents; they go to the pre-school education institution for children with speech and language disorders. The children were divided into 2 groups: in the first group there were non-verbal children (n = 5) and in the second group there were verbal children with different speech and language disorders (n = 22). During the research, there was observation of the children and corrective developmental intervention. The results of the research show that there is strong correlation between the speech development and development of fine motor skills (fine muscles). The reduction of the speech and language disorders is tightly connected with the improvement of fine motor skills.

Keywords: preschoolers, fine motor skills, speech and language disorders.

Introduction

The development of a child starts at the moment of birth and continues to develop during the pre-school age. Well-developed fine motor skills play a big role in the intellectual and psychophysical development of a child. The famous educator Sukhomlynskij said that "the mind of a child is located at his fingertips" (Сухомлинский, (Suhomlinskij) 1986, 16).

The other famous phychophysiologist and movement physiologist Bernstein once said that "during the movement exercise it is not the hand

that is trained but the brain" (Бернштейн, (Bernstein) 1990). Simultaneously with hand movements there is the sensory development of speech/language, the ability to express oneself freely. Unless the movements of every finger of hands become free and unrestricted, the correct development of the speech is restricted; if the fingers of hands are developed, the speech and thinking of a child will develop. Developed fine motor skills are a significant element of the psycho-physical, emotional and cognitive development of the child.

What are the fine motor skills? The fine motor skills are the ability of fingers to perform all the differentiated movements that determine a successful establishment of different self-service and learning, work and other operations (Cameron et al., 2012; Семенович, (Semenovich) 2002). The area of fine motor skills includes big number of different movements: from simple gestures (grasping of toys) to very complicated movements (like drawing and writing).

In the traditional ontogenetic understanding a child discovers the surrounding world through movements and words and through interaction with it (Семенович, (Semenovich) 2002). As a result of this interaction, the consciousness of the child is formed, and his personality grows and develops as well. In this process action and interaction play the most important role. Movement and speech are the most significant factors allowing the child to comprehend the world of objects, to develop the level of sensory and motoric understanding as the starting point of personality growth. This process takes a long time: at the moment of birth of the child the structure of the brains of the left and the right cerebral hemisphere is identical. When the functions of hands start to develop, the cerebral hemisphere of brain that is associated with it is developed more since the leading impulses get there (Семенович, (Semenovich) 2002). However, when the level of the fine motor skills development is low, the speech development of the child will also be impaired, although the gross motor skills might be within the standard limitations or even above the standard (Sibley & Etnier, 2003).

The goal of the research is to analyze the mutual relations between the speech and language disorders and the development of fine motor skills.

The methods of the research: analysis of the scientific literature sources, investigation of the children in the context of speech therapy, observation and corrective developmental intervention, summarizing and analysis of the acquired data.

Theoretical framework

The development of fine motor skills is an important part of the corrective work performed with children with speech disorders. A pre-school child

learns about the world around and gets to know it through the activities of hands (Šternfelde, 2017; Brooks, Kempe, 2014; Berninger et al., 2006). This age (from 3 until 6–7 years) is the most beneficial time to develop the intellectual, psycho-emotional and creative skills – it is the time when cerebral cortex of the big halves of brains has not yet fully matured. The child has a need for movements: move different objects, grab everything with hands, draw, write, get dressed, get shoes on, do other every-day and learning activities. All of those tasks require coordinated and precise movements of palms and fingers. The small muscles of fingers work together with the higher mental functions – memory, imagination, visual and movement memory, speech (Brooks, Kempe, 2014; Dinehart & Manfra, 2013; Tūbele et al., 2013; Loras et al., 2013).

Many researchers confirm that exercising the fine movements of fingers stimulates the general and speech development of a child (Cameron et al., 2012; Kurtz, 2008; Berninger et al., 2006; Sibley & Etnier, 2003; Семенович, (Semenovich) 2002; Бернштейн, (Bernstein) 1991; Кольцова, (Kolcova) 1973). The development of the psychomotor characteristics happens in all types of the motoric spectrum: gross motor skills, fine motor skills, articulation. The famous educator Montessori has based her pedagogical method on the idea about the possibility to stimulate the activity of brains using the exercises of hands; the more the hands of a child are involved in different kind of activities, the better other cognitive processes develop.

The fine motor skills develop naturally from the early age of the infant. In the pre-school age, they continue to develop and become more complicated (Turkington, Harris, 2006). For a 3 years old child there are following characteristics of fine motor skills of hands: holding the pencil in hands, drawing with pencils, building houses from 8–9 blocks, catching the ball with both hands; then at the age of 6 years the child can draw letters and numbers, the holding strength of the hands has developed, the child can cut out pictures using scissors.

The play methods for hand exercises of children are activities that are universally didactic and developing (Brice, 2007). The main idea of play methods is based on the knowledge that the ends of nerves in the tips of fingers influence the brain of a child, and brain activity is therefore activated. Finger games is a great tool preparing the hands of children for writing (Dinehart & Manfra, 2013), therefore the level of development of fine motor skills is a crucial element in order to evaluate whether the child is ready for the school (Suggate et al., 2017; Bindman et al., 2014). In modern days there are high requirements regarding children who start learning in the school: they need to be well prepared. If the movements of fingers of a child have not developed sufficiently, there can be problems to learn to write, therefore it is so important to enhance the abilities of fine

motor skills in the pre-school age so that the process of learning to write would be more successful.

Methodology

Research took place from September 2018 until January 2019 in the preschool educational institution of Riga for children with speech and language disorders. Participants of the research were twenty-seven children of different ages (from 3 until 6 years old) and with different speech and language disorders. At the beginning of the research five children are non-verbal (two girls and three boys), twenty-two children are verbal (five girls and seventeen boys) with speech disorders with different etiology.

Methods used for the research: exploring of the anamnesis of every child (at the beginning of the research in September); analysis of the fine motor skills and speech and language in the starting phases and at the end of the research; analysis of the interaction between finger development and speech development using the Pearson correlation coefficient.

Results

During this research, the focus is mainly on the development level of fine motor skills. The research was divided into 3 phases:

1. phase: Testing of the speech and language abilities and the development of the fine motor skills of the children.
2. phase: Corrective actions for the improvement of the speech and fine motor skills.
3. phase: A repeated investigation of the speech and fine motor skills of the children as well as summarization, comparison, and analysis of the survey results.

In the beginning of September (2 weeks) the investigation of the language and speech abilities was done as well as the testing of the fine motor skills individually and in small groups (2–3 children). Speech abilities were tested according to several criteria: (understanding of speech – impressive language; usage of speech – expressive language; connected speech; pronunciation/articulation; skills of the phonological perception, skills of analysis and synthesis; pronunciation of words with complicated syllable structure.) All criteria have distinct indicators that provide understanding about the level of speech skills of the respondent and compliance with the standards of ontogenesis (see Table1).

Table 1. Investigation of the language and speech abilities

Criteria	Indicates/ years			
Impressive speech	3 years	4 years	5-6 years	
	is able to show pictures of nouns, verbs and adjectives that are used daily, can execute 2-level instructions, understands 3 prefixes from 4 (in, above, under, from	executes 2-3-level instructions, has good orientation skills around the room, recognizes "next to, behind, many, few, one", is able to show pictures: nouns, verbs and adjectives, basic colors; understands the correlation between cause and consequences	executes complicated instructions, is able to distinguish between similar word combinations	
Expressive speech	3 years	4 years	5-6 years	
	creates com-plete sentences, is able to say nouns, verbs and adjectives used daily, can say own name, gender and age	creates a sentence from 5–7 words, the speech is gram-matically formed, can name pictures: nouns, verbs and adjectives, basic colors; seasons of year, parts of a day	tells about things depicted on the picture: names the objects in one word/creates sentences from two words/uses longer sentences; understands the correlation between cause and consequences, can name days of the week, seasons of a year, months in sequence	
Pronunciation	3 years	4 years	5-6 years	
	replaces/ doesn't pronounce some sounds	replaces/ doesn't pronounce some sounds	pronounces all sounds	
Phonological perception	3 years	4 years	5 year	6 year
	repeats at least two-syllable rows with sounds of early ontogenesis	repeats two-syllable rows with sounds of early ontogenesis	repeats three-syllable rows with sounds of early ontogenesis and sibilants; is able to determine the first sound in the word	repeats three-syllable rows with sounds of early ontogenesis and sibilants; is able to determine the first and the last consonant in the word; is able to determine the sequence of sounds in the word
Pronunciation of words with complicated syllable structure	3 years	4 years	5-6 years	
	words with one and two syllables	words with two syllables	words with three-five syllables	

Each task is evaluated on the scale from 1 to 3 where 1 point means that the child did not fulfil the task; 2 points mean that the child performed the task with the help or by repeating; 3 points mean that the child fulfilled the task.

This evaluation was done individually, taking into account the psycho-emotional condition of every child at the moment of the evaluation. The duration of each session differed depending on the age of the child and how ready the child was for the cooperation (minimum 5–10 minutes, maximum 20 minutes). Another important criterion for the evaluation was the current level of speech and language abilities of the child. If the child was verbal, then all criteria of speech development were tested; if the child was non-verbal, the impressive speech of the child was tested.

The following criteria were established to evaluate the development level of the fine motor skills for each child (see Table 2).

Table 2. Fine motor skills development

Criteria	Tests
Kinetic/dynamic skills*	Fingers position Graphical skills "First – edge – palm" (A. Luria) Finger movements
Reciprocal skills**	Fingers "marching" "First – edge – palm" (both hands) (Luria)

*kinetic abilities (can the child keep the specified posture);
*dynamic abilities (can the child switch from one activity to another activity);
**reciprocal abilities (ability of the child to perform activities with both hands).

In the practical sense, the task was performed in the following sequence:
- try-out evaluation movements that are not evaluated;
- afterwards the speech therapist shows exercises that the child has to repeat.

If the child is not able to fulfill the task, the movement is shown again, and the child tries to repeat it again. If this also does not help, the method of passive movements is used: the tester positions the hand and fingers of the child in the correct position and then the child repeats the movement again by copying the tester.

Every test is evaluated according to the scale from 1 to 3 where:
1 point – the child did not perform the task;
2 points – the task was performed with the help of the adult;
3 points – the child performed the task.
The kinetic and dynamic praxis include different tests, for example:

The tester asks the child to show "a rabbit", "a rooster", "a goat". The rest of the fingers need to be pressed to the palm and held in this position for the time when it is counted to 10.

The interpretation of test results. The child is able to manage the bending muscles if he is able to keep the specific posture without straightening the fingers. The child is not sufficiently able to manage the bending muscles or is not able to manage them at all if fingers straighten unwillingly.

The establishing of the level of the graphical skills of the dominant hand. The process of testing. A pencil is given to the child and it is observed how the child is holding the pencil. Then the child is offered to draw 2 lines according to a template (a vertical and a horizontal line). Then the child needs to fill in the given template with the color using the colored pencils or crayons.

The result of the test is determined by a correct line, correct body posture during the work, by the fact if the movements of hand are relaxed.

The switching of finger movements of the dominant hand "Fist – edge – palm" (Лурия, (Luria) 1973)

The process of the test. The tester offers the child to repeat a series of nine movements after himself. The series consist of movements that are repeated three times: "Fist – edge – palm".

There might be a disturbance: switching from one type of movement to the next; sequence of the movements.

Interpretation of test results. Switching between movements is considered sufficient, if the instructions of the tester are performed without mistakes. The switching is considered insufficiently developed if the switching of hand movements is disturbed: when the character of child's movements does not correspond with the instructions given by the tester.

Test to evaluate the level of precision of execution of finger movements "Fingers greet each other". The tester offers the child to make circles with the thumb and index finger and then with other fingers in a sequence.

Interpreting of test results. The precision of finger movements is considered sufficient if the child switches between the fingers swiftly, not making mistakes in the switching sequence. The precision of finger movements is considered not sufficient when the child executes the movements incorrectly, movements are clumsy, child makes mistakes in the sequence of actions.

The reciprocal praxis is tested using the following tests:

The test of "marching" with the fingers on the table. The tester shows the task to the child: the index finger and the middle finger are "marching". Both hands do the action simultaneously.

The test "fist – edge – palm" (Лурия, (Luria) 1973). The test is performed with both hands simultaneously, repeating the series of nine movements.

According to the results of the diagnostics that was done in September among the twenty-two verbal un five non-verbal children the conclusion could be made that the level of speech and language development was average for eighteen children, low for five children and very low for four children. This can be concluded from the initial evaluation when none of the children could obtain the maximum number of points. The best result among the non-verbal children is 21 points out of 42 available, that one child obtained, among the verbal children one child obtained 40 points, two children 38 points, four children 37 points. The majority of verbal children showed the average level of speech development.

Also, the fine motor skills tests showed that the results for the non-verbal children were lower compared to the verbal children with different speech disorders. For the children who are non-verbal in the beginning of September, when tests are performed, the dynamic and reciprocal praxis is very low. The kinetic abilities are also not sufficiently developed. Regarding the verbal children, the kinetic and dynamic skills are well developed, they struggle with the tasks for checking the reciprocal abilities.

In order to establish if there is a statistically significant correlation between the level of speech development and fine motor skills development, the Pearson correlation coefficient was used. There is an analysis of the results acquired in September, so it can be concluded that there is a strong correlation ($r = 0.886$) between the researched criteria (see Figure 1).
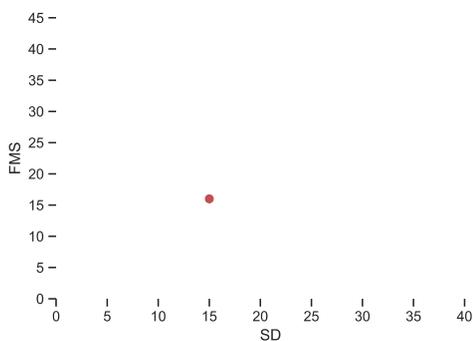
FMS – fine motor skills
SD – speech development

Figure 1. Pearson correlation coefficient between the level of speech development and fine motor skills development (September)

According to the diagnostics results, corrective development activities were performed with all the children, especially with the non-verbal

children and verbal children whose fine motor skills were not sufficiently developed, especially the dynamic and reciprocal skills.

In order to improve the development of fine motor skills different exercises and play methods were used: (playing with small objects, playing with yarn, puzzles, construction sets, counting sticks, activities with paper, activities with pencils, colours and brushes, crayons, finger games in a dry pool).

In order to improve the speech quality, specific exercises were developed for articulation and breathing, exercises for developing of phonological awareness, games and activities for creation and improvement of communication skills, tasks for improving the lexical structure and grammatical constructions.

The diagnostics were repeated in January after finishing the series of sessions of corrective and developmental speech therapy and sessions to improve the fine motor skills of fingers. The methods used were the same as in the beginning of the research. Results showed significant changes in the fine motor skills area where one child obtained 44 points, that is the highest result after the intervention. Six children obtained a high result of 43 points out of 45 available, five children 42 points, four children 41 points, and five children 40 points, six children obtained average results from 26 to 34 points.
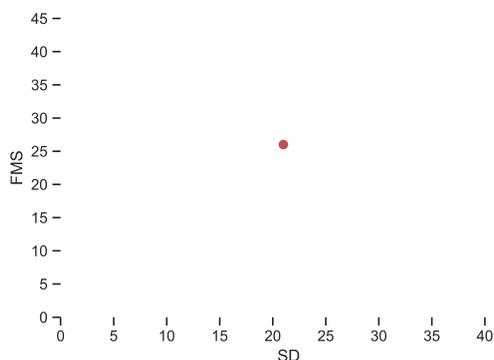
FMS – fine motor skills
SD – speech development

Figure 2. Pearson correlation coefficient between the level of speech development and fine motor skills development (January)

There are also positive results in the development of speech and language. All children use verbal communication as the main method of communication. Children who were non-verbal in September (n = 5), in January, were in the group of children who were poorly verbal, and this

demonstrates the improvement in their speech abilities. When comparing the development level of language and speech skills and the development of fine motor skills, it can be concluded that in January (see Figure 2) there is a significant correlation between these criteria with a positive coefficient (r = 0.836).
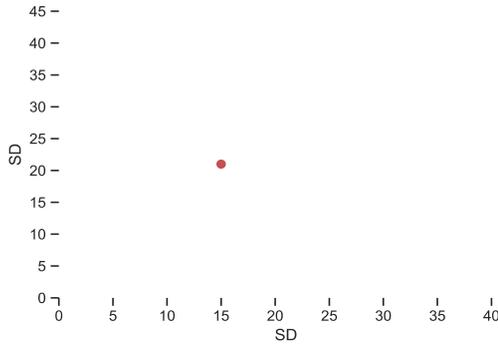
SD – speech development

Figure 3. Pearson correlation coefficient between the level of speech development in September and the level of speech development in January
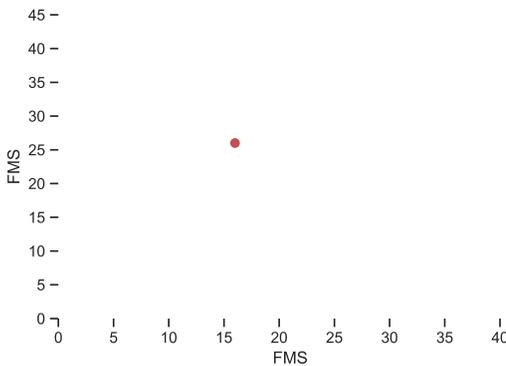
FMS – fine motor skills

Figure 4. Pearson correlation coefficient between fine motor skills development in September and in January

By evaluating the results from September and January it can be concluded that the speech abilities have improved (see Figure 3), the mobility and skills of fingers have improved (see Figure 4), and there is a statistically significant connection and a correlation between the development of speech and fine motor skills. At the end of the research, positive dynamics

can be observed, and it can be concluded that the improvement of one skill subsequently increases the values of other skills.

Conclusions

Insufficient development of the fine motor skills influences the speech development of the child: if the level of the fine motor skills development is low then the speech development of the child is also disturbed;

For non-verbal children the level of the fine motor skills development is lower than for verbal children;

The corrective developmental activity sessions for the development of the fine motor skills brought positive results;

The activity sessions for the development of the fine motor skills for non-verbal children with low level of the fine motor skills development showed positive dynamics.   The results of the experimental research are provisional, and they need to be tested with a bigger number of children for a longer period of time.

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DEVELOPMENT OF CRITICAL THINKING IN EDUCATION OF LATVIA: SITUATION ANALYSIS AND OPTIMISATION STRATEGY

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ABSTRACT

The aim of this study is to analyze the experience of developing critical thinking in schools and higher education institutions of Latvia within the last 20 years. It should be emphasized that 2018 marks the 20th anniversary since the project to develop critical thinking approach in the education of Latvia was started. That is a significant reason to look back and also to evaluate critically the progress made in this area.

Even though critical thinking has been important for the educational practice in Latvia since mid-90ties of the 20th century, it is still a subject of heated debate. As a Post-Soviet state, Latvia joined the critical thinking promotion movement in 1998 with a view to advance a more rapid formation of a democratic consciousness in the society. Education was perceived as a means to socially transform (i.e., democratize) the society. But the study "On the use of the critical thinking development approach in educational system: its impact and effectiveness in Latvia" that was done ten years later, in 2008, demonstrated that no significant changes had taken place in the education system of Latvia in those ten years. The social studies of recent years even suggest that the society of Latvia is becoming more radicalized. The same processes could be at work in another area of education development, one can observe difficulties with understanding and promoting media literacy in the context of the society of Latvia becoming digitalized.

This study analyzes the reasons behind the current state of affairs and suggest some ways forward. Notwithstanding the polarization of opinion, critical thinking in Latvia is still considered to be a means to reach participatory democracy and create a democratic model of education.

Keywords: critical thinking, critical thinking approach in education, a democratic model of education.

Introduction

Freedom, responsibility and tolerance are considered to be values that are particularly significant for a democratic society; however, ensuring these values is one of the most difficult tasks for the democratic society. Safety that is rooted in freedom, not the restriction of freedom, is a vital condition of this society. This means that a member of a democratic society has to develop such personal qualities that would give a possibility to be aware of and cultivate the critical understanding of one's freedom and at the same time to understand and respect the other person's rights to it. Thus, one of the key objectives of modern education is to promote the development of such a society the representatives of which value highly every person's ability to be free, tolerant and critically thinking. They should respect every person as an individuality but also be aware of the belonging and involvement as personally meaningful values that include both the social, universal, and ecological dimension. This process should start with the individual's self-awareness, self-reflection and self-criticism (Rubene, 2008).

The dynamic development of the society incites the education to react to the social and cultural novelties, reorganizing continually and seeking adequate solutions to the challenges of the age. The traditional understanding of education as passing the knowledge and principles of one generation to the next is replaced by a new one the aim of which is to prepare new generations for the life in the future society emphasizing the necessity to activate pupils and students' thinking potential, to develop independent inquiry skills for solving the tasks presented by the changing social environment and global challenges.

One of the most important factors in today's social transformations is the development of information technologies. It influences the demand for critical thinking skills for two reasons at least. First, information technologies change considerably the situation in the labour market and understanding of the concept of work. This, in turn, means that in future more than today the employees, professionals and creators of their own jobs will need the skills that will allow them to adjust dynamically to the rapid changes in the social, economic, business and technology environment (Schwab, 2016). Critical thinking is one of such skills. For instance, the European Council mentions it as a vital part of several key competences (literacy, digital entrepreneurship) that a person needs to be able to join successfully the labour market (Council of the European Union, 2018).

Secondly, the development of information technologies increases rapidly the amount, diversity and quality of the information accessible

in the public space. The way we communicate, perceive and analyse information changes (Eriksen, 2001). The dissemination of "fake news", trends of manipulated populism in several Western democracies, as well as the success of state-organized cross-border propaganda give cause for concern about the capacity of critical thinking to influence society and the possible threats that result from the impoverishment of the judgment. Nowadays it is difficult to evaluate information; there is a possibility to manipulate with it easily, and it evidently exerts impact on the public opinion and the quality of the public discussion (Rifkins, 2004; McIntyre, 2018). Still, critical thinking as a means for developing independent thinking is considered by many to be a solution to these problems.

One should not forget another reason why the inability to evaluate the information critically and to form a qualitative discussion is dangerous to democratic societies. Since Enlightenment critical thinking has been considered an important means to avoid violent conflicts. Critical thinking is not just about the ability to evaluate information, it is also a tradition essential for democracy in which conflicts are solved through a reasoned discussion. If there is no discussion and consensus at the end of the discussion then the quarrel has to be solved with the help of violence.

Accordingly, if these assumptions are correct then the inability to listen to arguments, the lack of any tolerance towards another opinion, the inability to reach the decision in the discussion that is acceptable to all parties, even if not perfect, can turn out to be a way to the society in which violent conflicts become commonplace. It does not mean that the critical thinking tradition is untouched by power relations and does not have its normalization aspects. Therefore, in the end the question about critical thinking is the question about the society we want to live in, and correspondingly, how do we imagine the future of the world, Europe and Latvia.

Thus the question about the forms and methods in education that help to develop the learner's skills to analyse and assess the diverse social processes becomes crucial. Respectively, the skills of independent learning and formation of judgments in modern social sciences are considered one of the most significant means for the person's self-realization in society.

Not only pedagogues, but also sociologists, philosophers, anthropologists, psychologists and political scientists have joined the discussion about the conception of the future education and upbringing. Representatives of different social sciences and humanities are preoccupied with the social identity problem, the problem of stereotypical thinking, and the issue of accepting the difference. Thus, the clarification of pedagogical possibilities of improving critical thinking becomes one of the topical problems in modern education.

Although the method of forming critical judgments has been seriously analysed and explored since the 18th century in European scientific thought, debates still continue, and also in the in pedagogical discourse of Latvia, the concept of critical thinking has raised discussions (Rubene, 2008; Rubene, Svece, 2018). There is a part of the society in Latvia which is close to the science and practice of pedagogy and supports the introduction of critical thinking approach in schools and universities. There are also those who consider the pedagogical model related to this theory to be imported from America and assess rather sceptically its adaptation possibilities in Latvia. Both groups are participating in these discussions. However, despite the polarization of opinions, critical thinking has been a well-known phenomenon in Latvia since 90ies of the 20th century.

Yet, it has to be admitted that in 20 years, on the one hand, critical thinking as a phenomenon of education has become known and accustomed in Latvia, on the other hand – effective development of critical thinking is still considered problematic in the education of Latvia.

Idea of critical thinking in the education discourse in the 20th century

Critical thinking in the context of education is explained as understanding of good thinking, as a pedagogical approach, or a set of teaching and learning strategies the aim of which is to promote independent thinking, considering it as the opposite to mechanical memorization, repetition, application of rigid models. Critical thinking is explained also as a method for making meaningful and responsible decisions both in teaching/learning and social spheres (Rubene, 2016).

The critical thinking phenomenon in the context of education has developed in two relatively independent directions – one of them implements the development of critical thinking directly, i.e., as a separate school subject, the other – indirectly, i.e., as a transversal skill of the whole teaching/learning process (Klafki, 1998; McPeck, 1981; Rubene, 2008).

The direct approach of developing critical thinking emerged in the USA where it has been considered a serious part of pedagogical theory and practice since the 70ies of the 20th century. In the 80ies of the 20th century, the critically reflective paradigm of education that envisaged the inclusion of critical thinking as a subject in the teaching/learning content was already considered a point of reference for the education system reforms in the USA (Kincheloe, 2000; McPeck, 1981; Rubene, 2008). Critical thinking in the pedagogical practice of the USA is known as the movement of informal logic and critical thinking, the key driving force of which is the demand for general judgment skills, and the task of which is to improve

the judgment, argumentation, critical analysis and debating skills with the help of methods specifically developed for this purpose. Thus, the basis of research interest is the development of pedagogical conditions and tools for purposeful and effective development of learners' logical thinking skills (Ennis, 1996; McPeck, 1981).

Critical thinking in this approach is understood as a rational action of individual consciousness that possesses the ability to identify and reflect on one's thinking process and that is necessary for productive functioning in the society. Robert Ennis, Richard Paul, Mathew Lipmann a. o. are named as the leading representatives of the direct critical thinking approach in education (Ennis, 1996; McPeck, 1981; Paul, 1990).

The direct critical thinking movement in education has created several fundamental conceptual questions in its development, e.g., whether the direct development of critical thinking in school really brings the desired outcomes – it is possible, it is better to teach the reasoning skills indirectly in the process of studying philosophy, mathematics, or classical languages (Hinkkanen, 2000; Kincheloe, 2000; Paul, 1990). The acquisition of critical thinking as a separate school subject has also incited the discussion that is connected with the opinion that every branch of science presupposes a specific way of reasoning therefore it is possible to learn it only within the framework of this science.

It has to be admitted that the above mentioned discussions are rather well-grounded. Reducing critical thinking to the logically argumentative aspect and understanding it as a reflection on the cognitive process, the aspect of "criticism" in critical thinking is curtailed and understood very narrowly. This discussion continues also in the pedagogical discourse of Latvia, especially concerning the use of the critical thinking concept in the accepted sense of pragmatism pedagogy – automatic, non-reflected transfer of concepts from one tradition to the other is criticized. The discussion about the use of the concept "critical thinking" in the education of Latvia is commendable not just because critical evaluation of concepts is the requirement of the critical judgment method but also because it promotes research in this sphere.

In the education research of the turn of the 20th and 21st centuries, critical thinking is called formal when it is reduced to the development of formal analysis and argumentation skills or culture-neutral critical thinking. Emphasizing the idea about the acquisition of effective strategies and techniques as a means of developing critical thinking, the development of critical thinking in school is often reduced to the acquisition of teaching/learning methods – learners train isolated cognitive skills and receive assessment but they do not apply them in their everyday life. It is claimed that the main mistake of the programme as it was introduced in education

system is the loss of the idea of total integrity of critical thinking, dividing it in concrete skills. The assumption that parts joined together will equal the whole has turned out to be a hasty one. It has to be admitted that in this case the whole is much broader and more complicated than simply the sum of the parts (Hinkkanen, 2000; Kincheloe, 2000).

Critical thinking in this approach is being hyper-rationalized, reduced to the totality of cognitive skills that facilitates instrumental knowledge but tries to distance itself from political and ethical dimensions. Critical thinking thus loses its reflective character in its broader sense and becomes disinterested because it is perceived as a cognitive process which takes place in vacuum. The fact that critical thinking always requires personal transformation is forgotten. Students are taught to differentiate, to group, to divide in categories, to distinguish essential information from irrelevant, to draw conclusions, to justify claims, etc. while staying in the boundaries of formal thinking, learning a fragmented and simplified version of scientific thinking (Hinkkanen, 2000; Kincheloe, 2000, Rubene, 2008).

The second approach which develops critical thinking as a transversal skill in the whole teaching/learning content has been formed in the context of critical pedagogy, which emphasizes the independent, emancipating advancement of critical self-reflection for the development of democratic society. Such concepts as critical judgment, learning, emancipation, autonomy, judiciousness should become the leading motive in today's democratic society in which people can influence the social conditions and to use them rationally (Klafki, 1998; Kron, 1999). The aim of critical pedagogy is to develop critical thinking as a transversal skill, i.e., to promote social transformations with the help of sensibly thinking individuals. Critical pedagogy, too, announced itself in the 70ies of the 20th century; its most significant representatives are Wolfgang Klafki, Paulo Freire and others.

A specifically elaborated teaching/learning methodology is less characteristic to critical pedagogy; it emphasizes more a particular view for explaining the localization of social problems with the help of judicious action, emancipation and self-determination. The person's independence and self-determination has to be developed through education, the individual education process is treated as a socially conditioned process. The objective of the pedagogical action is to give a formation possibility for the individual who is ready for democratization, emancipation, mental maturity and self-determination (Klafki, 1998; Rubene, 2016). The criticism of ideology in critical pedagogy is looked upon as a teaching/learning method for shaping the sense of common responsibility, for finding out and preventing the risks that threaten democracy.

The approach that critical pedagogy has chosen for developing critical thinking in education has also provoked discussions. Representatives

of critical pedagogy are criticized for the lack of precise methodological instructions that improve critical thinking. Also, the very idea of emancipatory pedagogy – the possibilities to form an individual who is completely free and who is not connected with his social and cultural historical situation – is being questioned (Kincheloe, 2000; Rubene, 2016). Namely, time and space restricts the individual, thus also his potential possibilities are restricted. It is connected with the social political experience and memory of Europe − the historically acquired prudence makes us doubt the belief in the unlimitedness of human thinking abilities. Thus, the very idea of a critically thinking personality is being problematized.

However, it has to be admitted that in the context of society's digitalization one can hear more often an opinion that indirect development of critical thinking, e.g., its acquisition synthesizing critical thinking and media literacy, has to be considered the most optimal pedagogical strategy (Rubene, Svece, 2018).

The development of critical thinking in the education system of Latvia has been rather unique – there have been attempts to implement both direct and indirect approach of developing critical thinking in the school and university practice. Unfortunately, the situation in the field of developing critical thinking in the education of Latvia can also be described as unsystematic, untargeted and fragmentary.

Critical thinking in general comprehensive education in Latvia

In 2018, the approach of developing critical thinking celebrated 20 years in Latvia. In 1998, the program "Transformation in Education" was launched with the support of Open Society Institute and Soros Foundation in Latvia and the ambitious movement to develop critical thinking was initiated. The movement focused on promoting the critical thinking skills of school teachers and academic staff of higher education institutions. Numerous further education courses were organized, several textbooks were published, and the idea of developing critical thinking was integrated into education standards of Latvia.

It is necessary to emphasize the fact that all of this happened shortly after the collapse of the Soviet Union in 1991. The purpose of developing critical thinking in education in the 90ies of 20th century was a necessity to accelerate the development of democratic consciousness in society more rapidly, considering education as a means of social transformation of the society – a means of democratization. In the post-Soviet society there was a lack of ideas and skills relevant to democracy – such as argumentation skills, civic participation, openness to diversity, etc. Therefore, the development of critical thinking in Latvia should have

become an important milestone for the transformation of public opinion. Naturally, there emerges a question whether the disposition of critical thinking has overall increased in education and society?

The non-governmental organisation "Education Development centre" (EDC), which is considered the most significant implementer of critical thinking development programmes in Latvia, in cooperation with *International Reading Association* and *Reading and Writing for Critical Thinking International Consortium, RWCT IC* during the time period from 2004 till 2017 has organized further education courses and professional development of teachers and other educationalists in Latvia in the field of developing critical thinking. EDC data show that 13 414 teachers and education-related specialists have finished such professional development courses (EDC, 2018). EDC has acted as the deliverer of courses for developing critical thinking skills, has contributed to the improvement of knowledge and skills of university academic staff and other educationalists, has initiated discussions about the promotion of the critical thinking approach for university academic staff, education policy makers, education leaders and society representatives.

However, on the whole the results of education research allow us to conclude that the development of critical thinking in education in Latvia has not reached the aims intended by the implementers of this idea (Baltic Institute of Social Sciences, 2008; ICCS, 2016).

In 2008, the Education Development centre together with Baltic Institute of Social Sciences performed a study "*On the use of the critical thinking development approach in educational system: its impact and effectiveness in Latvia*". The aim of the research was to explore the impact and effectiveness of critical thinking in education system and to gain understanding and evaluation of the involved target groups within the period of 10 years. This research served for the society of Latvia as a summary and reflection on the development within critical thinking in the context of education.

Although the study marked many benefits gained from the implementation of the critical thinking approach in the education of Latvia, e.g., students had developed a number of skills necessary for learning (the skill to select and structure information, to work in a group, to cooperate, etc.), this approach had made the teaching/learning process more interesting and attractive as well as positive changes were observed in the mutual interaction models of teachers and pupils, the study still did not show considerable changes in the improvement of critical thinking in the education system on the whole (Baltic Institute of Social Sciences, 2008).

It was concluded that the requirements to develop learners' critical thinking skills appear only fragmentarily in the education policy documents of Latvia. One of the main reasons for such a conclusion was the fact that

teachers used the critical thinking approach in schools based on the notion that this approach is a combination of various interactive teaching methods. Teachers lacked conceptual understanding of the approach of critical thinking from the perspective of philosophy of education; therefore, they were largely unaware of the impact of these methods in the social sphere. Teachers admitted that they also had difficulty changing their usual working style. As a result, they used the new methods to work "as usual" (Baltic Institute of Social Sciences, 2008).

As a problem in implementing the critical thinking development approach was mentioned not only teachers' insufficient readiness to adopt this approach, but also the parents' attitude. For parents, it seemed more important to have children receiving a certain amount of knowledge at school rather than the ability to analyse and evaluate this knowledge. Therefore, they considered the development of critical thinking insignificant.

Overall the authors of the research came to the conclusion *that by improving the models of teachers education, by eliminating fragmentation in education practice, and also by anticipating conceptual changes in of the study process, growth of effectiveness of the critical thinking approach are expected* (Baltic Institute of Social Sciences, 2008).

In the last 10 years the relevance of critical thinking to the society of Latvia has only grown – it has social and political, local and global causes. Developing critical thinking in the context of digitalization of the society has gained a new context – it is named as a component of contemporary media literacy (Spurava, 2018). All the above mentioned also resonates in the field of education – the work on promoting critical thinking has continued among students, in teacher education and professional development. However, has the situation changed substantially?

Latvia has joined the International civic and citizenship education study (ICCS), which assesses comparatively in time and space pupils' civic knowledge, civic attitudes, their understanding of participation and involvement. The aim of ICCS is to evaluate the readiness of the young people in the participating countries to take civic roles that are characteristic to the second decade of the 21st century. This study involves the evaluation of the students' critical thinking skill. In 2016, the results of the International civic and citizenship education study showed that the achievement of Latvia's pupils in the field of civic education were lower than the European average. It was concluded that the teaching/learning process, which was implemented in the field of civic and citizenship education in Latvia was a non-efficient process and this explained the low achievement.

The results of the survey carried out in the study showed that teachers in Latvia had a theoretical knowledge about the significance of the critical thinking skill – 65 % of teachers (ICCS 2016 average is 61%) mentioned

in the survey the promotion of critical and independent thinking as one of the most important aims of the civic education. However, the achievement of their pupils did not demonstrate a high level of critical thinking. It leads to the conclusion that teachers know what critical thinking is and are aware of its necessity but cannot apply this knowledge in practice for promoting their pupils' critical thinking (ICCS, 2016).

The recent education reforms have given hope to those involved in the education system that the improvement of critical thinking in the education of Latvia has obtained a systemic outline.

In 2018, the National Centre for Education of Latvia in the project "School 2030" worked out and on November 21, the Council of Ministers of the Republic of Latvia approved the compulsory teaching/learning content for preschool (preschool guidelines) and on November 27 – for basic education (standard (Regulations of the CoM, Republic of Latvia LR Nr. 716, Regulations of the CoM, Republic of Latvia Nr. 747, 2018). In 2019, the standard of secondary education has been submitted for approval in the Council of Ministers of the Republic of Latvia. Specific learning outcomes for the development of critical thinking as a transversal skill have been defined in all the above mentioned documents.

At the beginning of 2018, in the framework of "School 2030" the new vision on the education content of Latvia "Education for modern literacy: description of the teaching/learning content and approach" the aim of which is to improve the teaching/learning approach and the content at school as well as to implement substantial changes also in teacher education and professional development has been offered for public discussion. Critical thinking has been named in the project as one of the most important transversal skills for the modern learner. Thus, constructing the vision of future education, the necessity of developing critical thinking again has been emphasized in Latvia.

The abovementioned project considers critical thinking along with self-actualization, creativity, cooperation and other skills as the necessary transversal skill that every learner needs, and that has to be present in the whole teaching/learning process and in all subjects taught in school (School, 2030).

It can be concluded that, regarding critical thinking, the project "School 2030" has taken into consideration the conclusions drawn in 2008 in the study "*On the use of the critical thinking development approach in educational system: its impact and effectiveness in Latvia*".

First of all, the project envisages systematic changes in the school curriculum, and they are based on the general goal of having a learner who has mastered the necessary skills, knowledge and attitudes of the 21st century throughout the process of general education.

Secondly, by implementing a critical thinking approach in all the curriculum as a transversal skill rather than by developing it in separate school subjects, the fragmentation in the development of critical thinking will theoretically be eliminated.

Thirdly, the novelty of the project for Latvia is that teachers are not equipped with certain methods and techniques – they have received the goals of the activities which are critical thinking learners. Finding the most appropriate means for achieving this goal is the task of the teachers themselves. Moreover, by independently looking for solutions to achieve educational goals, teachers will also develop their critical reasoning.

Fourth, with the support of the European Structural Funds and the Ministry of Education and Science, a conceptual reform of teacher education has been launched in Latvia. It aims to create study programs that train teachers with skills and knowledge necessary for the new school curricula envisaged by the project "School 2030". Thus, the efficiency of teachers' activity is expected to increase (Rubene, Svece, 2018). The project "School 2030" offers a new model for the curriculum, but its success will depend on teachers' readiness to be actively involved in its implementation (an important indicator of democratic education).

Of course, the issue of the insufficient readiness of teachers in Latvia to implement the new curriculum has not gone away. First, not all teachers are ready to step out of their comfort zone, they want clear criteria for evaluation and clearly defined amount of knowledge that goes with that. The project "School 2030" gives much larger freedom to teachers and schools to create their own content and choose teaching methods that correspond to it, but that means also a greater responsibility and larger amounts of creative energy that has to be invested in the teaching process. For many it is a stressful position, and they look for clear and specific instructions for what to do in the classroom. Secondly, although the reform involves a complete review of the way teachers are trained on the university level and the development of new teacher training programs, this process is not directly supervised by the project "School 2030". That means there is a danger that in some areas there could appear a gap between the intentions of reformers and realities of teacher readiness for the new educational framework, including critical thinking as a transversal skill.

One should also mention occasions of negative reactions to the reform in general public. For example, in the context of discussions on the social role of the child in the family and at school, people sometime express concern about the danger of the development of critical thinking to the value system of children as it allegedly reduces obedience and respect for adults. Also, the attitude of Latvian politicians towards this project is not unambiguous either.

On the whole, it should be concluded that it is necessary to continue discussions about promoting the development of critical thinking in the general education system of Latvia to minimalize the stated shortcomings and deficiencies and to improve the implementation of the critical thinking approach.

Critical thinking in higher education

In order to describe the place of critical thinking in higher education, we have to return to the three meanings how this term is being used – as the ideal of thinking (independent, reasoned, evaluating thinking), as the method of teaching (the lecturer trains the student's ability to judge about specific questions without teaching critical thinking as a subject) and as an academic course (the aim is to teach particular techniques of text analysis and text construction in the broadest meaning of the word "text") (Rubene, Svece, 2018).

Critical thinking as an ideal has been present in higher education since its beginnings although the understanding of what this ideal means and how it should be manifested in the study process has changed with time.

Nowadays there are at least two main reasons why critical thinking is considered important – 1) higher education nowadays is required to ensure a link with the research, and research presupposes the skill to think independently and seek new solutions instead of repeating the acquired knowledge, 2) higher education still has not lost its social function, its task is to train people who are able to solve different problems not only the ones that have been mastered in the university study process but also new, situational, connected with different spheres of life and employment. University teachers admit that their aim is not to transfer information but to help students to become independently thinking persons and researchers (Paul et al,1997).

The fact that critical thinking ideal is highly valued in higher education does not mean that the aims of the study process are always attained and consequently we should ask how critical thinking as a teaching/learning methodology or critical thinking as a study course can help to reach these aims. It is not that a person who does not know the methodology of critical thinking cannot teach students independent thinking or that a student who has not had a critical thinking course is unable to think critically. Independent, critical and reasoned thinking is a general feature of human thinking and we can use it, in a way, intuitively. However, there is no doubt that our rationality is limited and intuition is not always effective enough.

Although the presence of critical thinking has been marked since 2008 both on the European and national levels in the Qualifications Framework

for higher education (EQF, 2018), the understanding of the critical thinking methodology among the academic staff of higher education institutions in Latvia, certainly, is not sufficient. Accordingly, one cannot claim it is used systematically in the study process. It means that the study process in higher education would certainly benefit if the skills to apply this methodology were trained and the academic staff had a clear notion what they were and how to use them in the teaching of particular areas of studies. The question is how to achieve it. It is hardly possible that the desired way would be compulsory requirements. It has to be taken into account that both learning of methodology and its introduction into the delivery of a concrete course requires enormous time and other resources. First of all, a convincing offer should be ensured – courses in the form of modules that the academic staff could master and in which there is clearly formulated benefit from such courses.

Critical thinking as a methodology has no limits; it could be applied to any branch of science and approbated for the particular needs. Critical thinking as a course that is offered to students and academic staff in several higher education institutions of Latvia, in a way, has a narrower application (Kincheloe, 2000). Although in principle it is possible to design a course, say, about, critical analysis of research texts in chemistry, such a course in the end would overlap with the methodology issues of the particular science in question. Another point is that also the methodology of science can be analysed on different levels and students would definitely need to acquire the most general level which analyses the general assumptions of the science. Critical analysis of science on this level basically becomes the philosophy of science.

Critical thinking as a course functions the most effectively as a general analysis of thoughts, statements and texts and corresponds to those skills that are necessary for any person who writes something, participates in a discussion and thinks about what the others have said. As a course critical thinking has developed historically as the analysis of argumentation and combines the elements of informal logic and rhetoric. Such courses are very rare in the higher education institutions of Latvia. Most likely, there are different reasons for that, one of them – such courses are dedicated to general competences, and do not focus on issues of one particular science that the university programme is meant to teach. This, certainly, belongs more to the domain of humanities and social sciences although science communication is one of the most important parts of the researcher's work today, and that makes critical thinking a subject essential also for them. Still, as it was said before, the course is almost never included in the study programmes either in the social sciences or natural sciences.

The presence of such courses in the university programmes would be recommended, yet it has to be taken into account that understanding about

what critical thinking course should be also has to be reconsidered. When in 1970ies, critical thinking courses appeared in the USA they were focused on the analysis of argumentation (Rubene, 2008). However, argumentation is not the only thing that is important for people's discussions and texts. Taking into consideration discussions about the perception of information in different media and ways of manipulating with the message, critical thinking should more incorporate themes related to rhetoric and media literacy.

Finally, the attention should be paid to the fact that at present one can notice conflicting and almost contradictory conceptions of what are the aims of higher education. The aim to link higher education to scientific research can get into a conflict with general educational aims of higher education; at the same time, focusing on research and the development of the person's general capacity to reason as the aims of higher education can contradict the society's demand for practicality and applicability in higher education.

This conflict is not absolute and often is rooted in misunderstandings; yet critical thinking as a method and as a course can help to connect these aims although it means also careful evaluation of aims and practices of critical thinking.

Conclusions: recommendations for improving the development of critical thinking in the education of Latvia

In order to analyse the situation in the development of critical thinking in education in Latvia, an experts' discussion was organized on August 22, 2018 in the House of European Union in Latvia "Development of critical thinking in education in Latvia". Education experts, academics, school heads and teachers as well as representatives of European Commission Agency in Latvia participated in the discussion. The discussion resulted in formulating recommendations for improving the development of critical thinking in education in Latvia.

On the state level:

- It is necessary to carry out a representative research about critical thinking skills in the society and the society's attitude towards critical thinking and its concrete aspects. The research should mark a broader social, cultural and value context that critical thinking has in Latvia, including the evaluation of out-of-school/university factors that influence the work and attitude of school and university teachers to critical thinking. It would be interesting to learn the level of critical thinking of "opinion leaders", e.g., politicians.
- Critical thinking has to be developed not only to avoid manipulations in media but also to decrease the possibility of violence, thus it is

also a question of safety. At present, critical thinking is often focused on independent evaluation of information, exploration of fake news, winning debates but more has to be done to work out methodology for schools and higher education that would allow to develop the culture of evolving a shared opinion, communication, making a common decision and discussions.

- To expand information campaigns about the necessity and importance of critical thinking in the society, emphasizing the content of critical thinking and its nuances, not the critical thinking phenomenon as such. The popularization of critical thinking should include the explanatory aspect, stressing critical thinking not only as a technical skill but also as an essential element in self-formation of a person and society, the connection of critical thinking with human and democratic values, as well as emphasizing critical thinking and reasoned discussion as a means of finding shared opinion, not as the practice of quarrelling and its legitimization.

In the education system:

- Clear criteria should be worked out for assessing the quality and development of critical thinking in the education system. Based on these criteria, it is necessary to perform a representative research about the situation regarding critical thinking in schools and higher education institutions in Latvia in order to formulate the necessary improvement mechanisms.

- A complex analysis of competence-based teaching/learning process is necessary for evaluating how concrete critical thinking skills are worked into and used in the teaching/learning process, especially paying attention to the contribution of different school subjects to the development of critical thinking competence, in order to avoid the situation that the teachers of subjects work on transferring knowledge relevant for their subject assuming that other teachers take care of critical thinking.

- Analysing the benefits and drawbacks from using different critical thinking strategies in the teaching/learning process, also comparing the direct and indirect approach in the development of critical thinking, to elaborate recommendations for teachers of different subject.

- To work out recommendations on how to ensure cooperation among teachers and/or university academic staff that considerably improves the possibilities to work critical thinking principles and methods into the teaching/learning process.

- To develop the understanding about the importance of group and project works in schools and higher education institutions. Cooperation as one of the key words that should help teachers to

expand simultaneously the presence of critical thinking in school curriculum and teaching process.

- It is necessary to develop purposefully the transversal skills in teacher education: critical thinking, logic, presentation skills, academic reading and writing, media literacy, civic education and ethics.
- To find a possibility in further education of teachers to organize courses on improving critical argumentation skills which will bridge the gap between teacher's knowledge about critical thinking and their own skills in this field.
- To allow children the possibilities of choice already at the preschool level thus developing their decision making ability and the ability to explain and justify their standpoint.
- To develop methods and recommendations about cultivating and popularizing critical thinking in the out-of-school organized learning process, paying special attention to the possibilities given by student research work at school, etc.

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THE CONCEPT OF POWER IN TEACHER TALK IN CONTEXTUALITY OF TEACHER'S AUTHORITY

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ABSTRACT

Education has been accepted as one major agency of socialization, and teachers and educational institutions as socializing agents. Teachers are looked upon as the individuals who can help to bring about positive changes in the lives of people. The role of the teacher has changed. Teachers do not see themselves as powerful. Imagining teachers as the most powerful creatures in the class seems plausible, but how is power relation represented in teacher's discourse? The way teachers see themselves as professionals and how they compose their identities in schools is important factor in teacher authority discourse. The problem of the social status of the teacher cannot be solved instrumentally by increasing the disciplinary power of teachers, but must be addressed as a more foundational problem concerning the basis of authority in a pluralistic society. The discussion on how power is activated, practiced and accomplished within and across children's everyday interactions with adults, is in great significance. Language plays an important role in authority constructions. Teachers' ability to control their use of language is considered to be as important as their ability to select appropriate methodologies.

Keywords: teacher talk, power, teacher authority.

Introduction

The world we leave to our children depends in large measure on the children we leave to our world. The world's hopes for the future rest with today's young people and their readiness to take up the challenges of the coming century. Education is seen as major vector in society. On the threshold of the twenty-first century, the education of the young has never been more in need of our commitment and resources. Our teachers have never been more crucial to our collective future.

The young generation is entering a world which is changing in all sphere. As an institution, the education system plays a key role in transmitting dominant ideologies of society (Clark, 2005). One of the ways it does this is through the reproduction and maintenance of a standard variety of a language through which, in turn, notions of national and cultural identity

are transmitted. The purpose of education is to initiate the young into the different ways in which, over the centuries, men have organized their experience and understanding of the world and to lead the individual to empowerment and social- emotional development. The person who offers the guidance, judgment and knowledge is the teacher.

Research problem

Education has been accepted as one major agency of socialization, and teachers and educational institutions as socializing agents (Patil, 2012). Teachers are looked upon as the individuals who can help to bring about positive changes in the lives of people. They are seen as natural leaders who can give advice on various affairs in the community. William H. Kitchen (2014) gives a view of education as a process that liberayes through the guidance and leadership of authority. In this version of knowledge-driven education, the teacher's authority should be absolute, so as to ensure that the teacher has the scope to liberate his students.

The success of being educated depends upon the ability of teacher to explain and inspire, and on the willingness of the young to engage. The discussion on the role of authority in knowledge development and the subject of lack of teacher's authority is in great tension. Teachers do not see themselves as powerful. The discussion on teachers' loss of authority is today taking on a totally new dimension. The role of the teacher has changed. From the former "man of repute" the teacher has become a service provider mistreated both by the media and by his students.
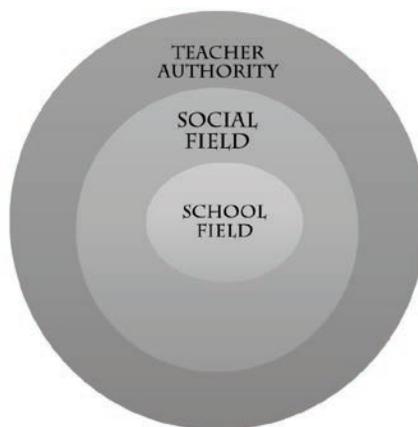
Figure 1. Teacher authority in fields

The issue of authority in education has been explored in some depth by various scholars. The problem of the social status of the teacher cannot be

solved instrumentally by increasing the disciplinary power of teachers, but must be addressed as a more foundational problem concerning the basis of authority in a pluralistic society (Dahlbeck, Lilja, 2016). It is important to have a view of knowledge transmission and teacher-student relations in the fast-changing world in which we live. The phenomenom of teacher's authority is intricated (see Figure 1) to the social and school fields, and it is its complexity (Cortizo, et al 2015). Figure 1 shows the school field inserted in the social field, suffering direct interference from economic, political, cultural and social in a diachronic and synchronic way. However, the specifics of school field distinguish it from other fields, because it is governed by communicational logic, that is given in a process where different people play different roles. Schools are complex spaces of social interaction for excellence. They are spaces of relation and communication. The relational and communicational features of this space, whose protagonists should share languages, affections and experiences in their daily life (Ferreira in Cortizo, et al 2015). Teachers as the most powerful creatures in the class seems plausible, but how is power relation represented in teacher's discourse? It calls on a necessity to investigate how this power is linguistically expressed by teachers and presented in the classroom. The discussion on how power is activated, practiced and accomplished within and across children's everyday interactions with adults, is in great significance.

Richmond and McCroskey (Richmond and Mc Croskey in Richmond, 2009) reviewed different studies on and came to the conclusion that these studies are based on the premise that:

   a) the role of a teacher, almost by definition, involves a social influence;
   b) the use of power is built into the job of a teacher;
   c) a teacher must have considerable amount of power to create the environment conducive to learning;
   d) for teacher power to exist, it must be granted by the students.

Teachers' knowledge and institutional status shift from the symbolic level to the social level of power and dominance mainly through the medium of discourse. An analysis of the teacher's discourse may reveal the details of the daily constitutive practices of power and authority (Wenren, 2014).

For Bernstein, the pedagogic discourse embeds the discourse of specialized competencies to be acquired, that is, what learners are to learn, in the discourse which creates and regulates social order. Pedagogic discourse specifically frames classroom discourse within a context of both power relations and moral values by revealing how the instructional discourse is embedded in the regulative discourse (Clark, 2005).

This paper reviews ideas of concept of power in teacher talk in contextuality of teacher's authority. It's a part of an ongoing PhD research,

literature review was used as method assisting understanding and interpreting the context of studied subjects.

Contextuality of the phenomenon of authority

The scientific literature indicates the need to pay attention to different aspects changing educational field and culture in building the contextuality of the phenomenon of authority.

Figure 2. Contextuality of the Phenomenon of Authority

In the process of conceptualization the phenomen of authority it has come clear that there are some important aspects making context in which authority of the teacher forms (see Figure 2 author's concept):

a) Crisis of concept of authority. Concern with authority is as old as human history itself. The modern world attempted to develop new foundations for authority – democratic consent, public opinion, science – Furedi (2013) shows that this problem has remained unresolved, arguing that today the authority of authority is questioned. The discussion is important: How do you have order in a world where people have different interests, and where religion can no longer provide a narrative or consensus? How do you get people to cooperate and to abide by a certain set of shared assumptions? The problem of order, of what morally grounds society, used to be the main subject many political thinkers dealt with. But now, as Furendi (2013) argues, the problem of order has been redefined in a more narrow technical sense, as a problem of social cohesion, for instance, or as a problem of trust. The break with tradition and the past as a source of authority – this seems to be a key turning

point in the conception of authority. From the "man of repute" a person above suspicion and beyond criticism, the teacher has become a service provider mistreated both by the media and by his students.

b) Social change. Social change takes place as a response to many types of changes that take place in the social and non-social environment. Education are all built on the assumption that learning is closely linked to personal and social change (Bourn, 2015). Education can initiate social changes by bringing about a change in outlook and attitude of man. It can bring about a change in the pattern of social relationships and thereby it may cause social changes. According to Patil (2012) in describing education as an instrument of social change, three things are important: the agents of change, the content of change, and the social background of those who are sought to be changed, i.e. students. Education can be used as a tool to empower the individual. Therefore, teacher's role as agents of social change is in great tension. Teachers are looked upon as the individuals who can help to bring about positive changes in the lives of people. Within these discourses and practices, the role of the teacher as the agent for promoting these changes is often assumed but rarely discussed as to what it means. The question is: what kind of adult authority is appropriate for free and pluralistic society?

c) Power relation change. Authority concept has close relation with the concept of power and influence. Authority means legitimate power. Power can be defined in variety of ways. Michel Foucault (2001) has been hugely influential in shaping understandings of power, leading away from the analysis of actors who use power as an instrument of coercion, and even away from the discreet structures in which those actors operate, toward the idea that 'power is everywhere', diffused and embodied in discourse, knowledge and "regimes of truth". Foucault (2001) is one of the few writers on power who recognise that power is not just a negative, coercive or repressive thing that forces us to do things against our wishes, but can also be a necessary, productive and positive force in society. Power is also a major source of social discipline and conformity. Power is the possession of authority, control, or influence by which a person influences the actions of others. One of the acknowledgments in new paradigm in describing childhood and adult-child relationships, is that children are active agents who are not simply shaped by the world around them but actively shape and change that world. Relationships between adults and children generate fields of negotiation and renegotiation where norms and expectations are actively challenged

and modified. Children adopt a host of multiple strategies in their dealing with adults, at times complying with or resisting adult control over their daily lives. Children interact with adults to produce negotiated outcomes. They make sense of and interpret their everyday interactions with adults. Within these interactions with more powerful actors, children strive to achieve elements of social control over their daily environment, power to make and shape decisions about their everyday lives. This focuses on necessitaty to revisit structured power relationships between adults and children (Leonard, 2015). The discussion on how power is activated, practised and accomplished within and across children's everyday interactions with adults, is in great significance. There are many important aspects in analyzing power relations among students- treachers, for example how power is exercised and resisted in various aspects of an academic situation in pedagogy. Parents and teacher now know that they have no control over the child; they only can control themselves and the resources at their disposal. Their authority manifests itself when they conscientiously use the means at their disposal, so as to best fulfill their responsibility (Omer, 2011). In promoting the new authority, we no longer focus on the reactions of the child, but rather on the actions of the adult. Cooperation has become a choice.

d) Teacher professional identity. Classroom is a preliminary stage for educational activities and it is a position for preparing people for living in a changing world. Classroom is a place that some direct services are provided for students so that they develop individually and socially and the requirement for healthy and holistic society development can be provided. Instruction or class management is a part of education and is referred as a part of educational activities that takes place with presence of the teacher in classroom. Therefore class management can be considered as an important indicator in teachers' task is a complicated take that is referred as an "art" (Esmaeili, et al 2015). The role of the teacher and its management style is highly important and essential for succeeding in educational objectives of students in proportion of today world. The way teachers see themselves as professionals and how they compose their identities in schools is important factor in teacher authority discourse. Challenges of modern society including school requires changes in conceptual approach of pedagogical sciences for interpretation of modern social phenomena. Situational and social challenges, in and out of the classroom, in the educational landscape that is located in a township or urban community, shape the identity of our teachers. Teaching has become so difficult, simply because of

the circumstances teachers face, which are way out of their control (Smit & Fritz, 2008). Authority is one of the core constituents of the professional identity of the teacher and an essential guarantee of effective classroom management and instruction (Wenren, 2014).

Why authority is needed- Dewey's ideas

Authority involves power, to produce and to regulate a certain kind of behaviour. Authority is connected with the rule-governed form of social life. The importance of moral education and teachers' moral authority has long remained the central feature of any education. Schools has responsibility for children's moral and intellectual development. Teaching itself involves moral action, classroom interaction is fundamentally moral in nature.

Dewey's (1987) ideas on authority reveals that authority stands for stability of social organization by means of which direction and support are given to individuals; while individual freedom stands for the forces by which change is intentionally brought about. The issue that requires constant attention is the intimate and organic union of two things: of authority and freedom, of stability and change. Dewey therefore believed that there is an intimate connection between the principle of freedom and the principle of authority. In a healthy society, he believed that individuals were in need of authority as much as they were in need of freedom. In this regard, the real problem is not to separate but rather to find out the proper relationship between them so that better understanding and action can come about in experience. Dewey placed authority in the method of organized intelligence as exemplified in the area of science. By elevating scientific intelligence to the status of authority, he viewed authority to be intellectual, not dogmatic as earlier centuries sought (Kim, 2013). Intelligence is the power to think of available information and acquired knowledge with deliberate reflection and to relate them to current issues in experience. It is also the ability to frame worthwhile aims and organize a means to carefully execute and realize them. The business of a teacher, Dewey argues, is to help students to develop such intelligence and continually increase in that power.

According to Dewey (1987), effective educational authority is to be exercised in a social context, where individuals, including the teacher, are involved and contribute to and participate in its common activities and understandings. In this way, Dewey insists that the principle of social control does not necessarily restrict the principle of personal freedom. Moreover, under such a condition, where the un- coerced consensus of social control prevails, he maintains that individuals in the classroom community, especially children, do not feel that they are submitting to external imposition even if they are called to order.

Language role in authority construction

There are many aspects of skilled professional practice that can be made explicit and which can help teachers to work more effectively, with even the most challenging young people.

Teacher talk is a powerful classroom tool to convey and construct meaning, to clarify understanding how teacher experience and talk in pedagogical situations. Teachers' ability to control their use of language is considered to be as important as their ability to select appropriate methodologies (Walsh, 2002).

In any interpersonal context, control over the use of physical and visual space communicates powerful messages about status and authority. Teachers' non-verbal behaviour will be a means of demonstrating their confidence and sense of professional authority (Reynolds, 2014).

What becomes the content of a school subject is not something unique or logical, but is defined by what those who regulate and control the curriculum believe to be the most useful and desirable to benefit society. Language is used to construct power relations. People may build power relations by establishing social categories. Teachers' words and the way they use them create meaning for students as well as themselves. Words acquire meaning only in human interaction in particular contexts and situations (Maftoon, Shakouri, 2012). From a Marxist point of view, as reported by Wodak (2001), language is not powerful on its own— it gains power by the use, powerful people make of it. Along the same vein, Jones (2007) says, "words don't produce or interpret themselves; people, engaged over some matter, are responsible for that". Language is not a word we may use to refer to the creative communicative endeavours of particular individuals, but the term for an abstract, self-contained system of forms, meanings, and rules whose existence is the precondition for successful acts of linguistic communication, any such act being the mere realization or expression of elements or rules in the system (Jones, 2007).

As Jones (2007) points out, to engage communicatively with someone is a form of conduct towards them, a way of treating them, and is, therefore, as is any form of human behaviour, an irreducibly moral act in the broad sense of the word, whether this is to do with the personal morality of rights and responsibilities. A successful educator in the field of teaching should be aware of the power of words and its impact on the audience and avoid using words habitually without thinking. Also, ordering is one of the conflicts which leads to failure in human interaction. The teacher should express his opinion with proper words and within the defined framework for his comments to be effective and penetrating. Therefore, the teacher, as the sender of the message, should first determine

the framework of his message and then express his expectations of the students frankly with appropriate tone and words (Gholipour, 2007). In the selection of words, the intended concept must be exactly in the words of the educator. It is appropriate to use clear, concise, accurate, polite, correct and rich expression in oral communication with the audience to transmit the speaker's intentions to the audience proper (Najafi, Rahmanzade, 2013).

In a democratic education the concept of power is shared. In this realm of philosophy, it is suggested that teachers should avoid displays of power to command in their classes so as to reduce the gap between them and students, which will surely help students to be more active in participating activities in class (Yanfen, Yuqin, 2010).

According to literature review, I have found some subjects to be indicators in analysing power relations which can be implemented in making observation protocol for the part for ongoing PhD research. Those indicators are:

a) Social cognitive aspect: through the analysis of the topics that people talk about, concludes that they represent the things that exist in their minds. Managing the mind of others is essentially a function of text and talk. Considering Van Dijk (1993) power is mostly cognitive, and enacted by persuasion, dissimulation or manipulation, among other strategic ways to change the mind of others in one's own interests. Walsh (2002) examined the ways in which teachers construct or obstruct learner participation in classroom interaction, through their choice of language. By construction he meant "increasing learning potential" which he claimed can be done through activities like, direct error correction, content feedback, checking for confirmation, extended wait time and scaffolding. Obstruction was defined by him as "reducing learning potential" which according to him, can be done through turn completion, teacher echo, teacher interruptions.

b) The class arrangements as signs of power (Benesch, 1999). Conceptual framework for questions about authority and control such as: what are students permitted to do in a particular setting? How do they respond to rules and regulations? How are decisions about control and resistance made? What is the way teachers present themselves and way instruction is carried out.

c) Body as a site of control (Fuko, 2001). The ways institutions regulate the body. The key feature of disciplinary power is that it is exercised directly on the body. According to Fuko (Foucault) power can also be said to create knowledge in the sense that institutions of power determine the conditions under which scientific statements come to be counted as true or false.

d) Teachers as moral agents (Bergem, 1990; Johnston, et al1998). How moral values are played out in the classroom, moral dilemma and decision making. Moral dimensions of teaching. Moral sensibility means gaining a deeper understanding of interactions in classroom.

e) Nonverbal behaviour. Nonverbal expressiveness is understood as the demonstration of behaviours that communicate energy, passion, and interest in teaching. The effective use of expressive nonverbal behaviours can positively influence a students' relationship with their teacher and their interest in the subject matter (Reynolds, 2014). Teacher intensity, enthusiasm, and perceived warmth are teacher personality attributes associated with effective teaching (Erbes, 1983). Teacher warmth, like enthusiasm, is conveyed through nonverbal means in the classroom and has been positively associated with student learning (Voelkl, 1995). Teachers who create a warm and inviting classroom provide an atmosphere conducive to learning (Stronge, et al 2007).

Conclusions

Teacher quality and authority are most important factors influencing learner outcomes. The traditional differential categorizations of "knowledge", the "teacher" and the "learner", as well as traditional ways of learning are challenged. This challenge obliges teachers to reflect on where their authority comes from, what kind of professional identity they wish to take, and what kind of relationship they wish to build with students (Wenren, 2014).

Language is used to construct power relations. Teachers use to explain, justify and make sense of themselves in relation to the students, and of education at large. Through the evaluation of their discursive choices and modes of presentation, the positioning of teachers can be seen to impact the most essential parts of the teaching process (Wenren, 2014). The strong and weak forms of authority can be illustrated through the importance that teachers ascribe to the claim of their desired identities. The strong form, framed through a high degree of certainty and discursive force about the teachers' high status and social position, reveals their insistence on the traditional role. As Wenren (2014) concludes, the strong form stresses knowledge, order, correctness, unitary proposition, timing, evaluation, etc. A strong form of authority is more consistent with the enduring power characteristics of institutional discourse and more resistant to the dynamics of local interaction. Knowledge is presented as absolute, hierarchical and decontextualized. A weak form of authority is characterized by low or middle modality verbs, low graduation, and an absence of extreme

expressions. Teachers may refer to friends and partnerships, but they are cited to relate with students or to tone down the teachers' importance.

As with many other aspects of teaching, the effort to understand the tensions of authority is important in itself. Authority is a constant in teaching; the authority of the teacher, and the relations of power and morality that underlie it, should then be a source of continual reflection.

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ATTITUDE AND VOCABULARY KNOWLEDGE AS PREDICTORS OF SENIOR SECONDARY SCHOOL STUDENTS' ACHIEVEMENT IN FRENCH READING COMPREHENSION IN SELECTED SECONDARY SCHOOLS IN IBADAN METROPOLIS

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ABSTRACT

This paper examined the relationship between reading attitudes and vocabulary knowledge of some senior secondary school students in Ibadan and their achievement in French reading comprehension. This study was a correlational type. The sample selected comprised 95 Senior Secondary School Students. Three instruments were used for the study. These are French Reading Comprehension Achievement Test (FRCAT), Questionnaire on Students Attitude to French Reading Comprehension (QSAFRC) and Test of Students Knowledge of Vocabularies (TSKV).(FRCAT), (QSAFRC) and (TSKV) had reliability indices of 0.82, 0.81 and 0.82 respectively. Data collected for the study were analyzed using Pearson Product Moment Correlation (PPMC) and Multiple Regression. Four research questions were raised and answered. Findings revealed that there was a significant positive relationship between the dependent variable (achievement in reading comprehension) and independent variables (Attitude to reading comprehension and vocabulary knowledge). Attitude to reading comprehension ($r = .471$, $N = 95$, $p < .05$) and vocabulary knowledge ($r = .356$, $N = 95$, $p < .05$). Findings revealed that there was a joint contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension. This means that 20.7% (Adj. $R^2 = 0.207$) of the variance in the students' achievement in reading comprehension is accounted for by the independent variables, when taken together. Findings reveal that there is a significant relative contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension, expressed as beta weights. Attitude to reading comprehension ($\beta = 0.538$, $t = 3.390$, $p < 0.05$) indicates most potent contributor to the prediction, followed by Vocabulary knowledge ($\beta = 0.183$, $t = 2.522$, $p < 0.05$). It was however recommended that teachers of French language as a foreign language in Nigeria should pay adequate attention to the variables of attitude to reading and vocabulary knowledge as these could hamper the adequate learning outcomes in French reading comprehension among learners

Keywords: Attitudes to Reading, Reading Comprehension, Vocabulary Knowledge, French Language.

Introduction

The French language is recognized as the second official language in Nigeria. Nigeria was colonized by Great Britain and obtained her political independence in 1960. English language was adopted as the official language to foster unity among diverse ethnic nationalities and ethnic groups English, according to National Policy on Education is described as language of administration, commence, international relation and diplomacy. French language which is the second official language in Nigeria is a language of international communication with the francophone neighboring countries in West Africa who are former colonies of France and also use French language as their official language of communication. Competence in the basic skills of listening, speaking, reading and writing in a foreign language such as French language is expedient in order to foster bilateral relation with these French speaking countries and Metropolitan France who is one of the prominent trading partners with Nigeria. Reading skill in French language is very important because it enables someone to be able to read and comprehend vital and sensitive documents written in French language.

Reading is one of the four basic language skills. It is required for academic achievement and success. It could be categorized as literacy skill which is essential for individual survival in life. Reading cannot only be confined to academic circle but also useful in acquisition of knowledge, ideas, information for healthy living and survival. The significance of reading for the attainment of academic achievement of students at levels of education cannot be over – emphasized. The primary aim of reading is comprehension. This is confirmed by Fakeye, (2017) who states that the good proof of reading is the extent to which the reader is able to comprehend what the reader has read, which is measured as the ability to make meaning out of a written text. Reading comprehension implies that readers are able to construct meaning from a written text. Carnine and Carnine (2010) clarifies the meaning of constructing meaning from the text which implies that the readers go beyond the meaning explicitly contained in the text, building up based on their own experience and ability to infer additional or deeper meaning.

Vocabulary knowledge on the other hand has significant effect on the reading comprehension in any language. This has been the focus of researchers in the field of foreign language and second language. Vocabulary knowledge and reading comprehension are interrelated and interdependent. Comprehension of written text depends heavily on the knowledge of vocabulary items and reading can also help enhance vocabulary growth (Maher Salah, 2008, Nation, 2001). Vocabulary knowledge plays critical role as the linguistic framework of the language among many other domains

of language such as grammar and phonology. Knowledge of vocabulary helps both in the acquisition of productive and receptive skills of language. Knowledge of words is a determining factor in language proficiency and success in academic pursuit because of its close affinity with comprehension of text (Bernhardt, 2005, Wang, 2009). Snow (2002) found the strength of relationship between vocabulary knowledge and reading comprehension and concluded that this strength of relationship increases as children advance in grade level. In the study conducted by Gelderen (2004) on the relationship between vocabulary knowledge and reading comprehension among students from Grade 8 to Grade 10, It was found that there is a significant relationship between vocabulary knowledge and reading comprehension. The findings of Tannenbaum, Torgesen and Wagner (2006) and Shiotsu and Weir (2007) attested to the fact there is relationship between vocabulary knowledge and reading comprehension. Mehrpour et al (2011) conducted a study on the relationship between vocabulary knowledge and reading comprehension on EFL learner, the result of the analysis revealed that both depth and breadth of vocabulary knowledge play an important role in EFL leaners' reading comprehension performance, depth of vocabulary knowledge makes a more important contribution. The study further confirmed a positive correlation between the depth and breadth of vocabulary knowledge signifying that the learners with large vocabulary size understand the words better.

Attitude to reading is another variable of consideration in this study. Lawal (2008) affirmed that students at the secondary schools are not only deficient in reading skills but have also not cultivated the habits of reading widely. This could be termed to mean that there is absence of reading culture among the secondary school students who are the target population of this study. The failure rate recorded in external examination such Senior School Certificate Examination (SSCE) conducted by West African Examinations Council (WAEC) and National Examinations Council (NECO) especially in language related subjects such Literature-in-English, French and English language is allusion to the fact that attitude to reading among the secondary students is negative.

Research questions

The study provided answers to the following research questions
1. What is the relationship between Attitude to reading comprehension and vocabulary knowledge and students achievement in reading comprehension
2. What is the joint contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension?

3. What is the relative contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension in French language

4. Which of the two factors would predict students' achievement in reading comprehension in French language?

Statement of the Problem

Reading is very important to language learning especially foreign language learning. The adoption of French as a second official language in Nigeria has made it imperative for learners to acquire appropriate skill in reading comprehension so as to be able to attain literacy in the language. Various research findings such as Tannenbaum, Torgenson and Wagner, (2006) and Shiotu and Weir (2007) and Lawal (2008) have reported consistent decline in the performance of learners of French language in reading comprehension. Major research efforts geared towards resolving this problem of poor performance in reading comprehension focused attention on strategies and methods of teaching reading and student and teacher related factors as determinants of their achievement in reading comprehension in French language but little attention was focused on attitude to reading comprehension and vocabulary knowledge as determinants of students achievement in reading comprehension. Therefore, this study investigated attitude to reading comprehension and vocabulary knowledge as determinants of students' achievement in reading comprehension.

Method of Data Analysis

The data collected for the study were analyzed using Pearson Product Moment Correlation (PPMC) and Multiple Regression.

Methodology

The study adopted the survey research design of correlational type. The design is appropriate since the researcher has no direct control on the independent variables as their manifestation already exists. Three instruments were used in the collection of data for the study. These are French Reading Comprehension Achievement Test (FRCAT), Questionnaire on Students Attitude to French Reading Comprehension (QSAFRC) and Test of Students Knowledge of Vocabularies. French Reading Comprehension Achievement Test (FRCAT) was adopted from Nouvel Horizon a comprehensive integrated course for Senior Secondary French by Tunde Ajiboye, Bounty Press, 1999.

The instrument contains a reading comprehension passage followed by ten multiple choice questions to test the understanding of students in French comprehension passage. This instrument was given to experts in the field of French Language to ascertain the face and content validity. It was also trial tested on a sample of Senior Secondary School Students that are not part of the main study. The reliability of the instrument was established through test – re--test method and a value of 0.82 was obtained Questionnaire on Students Attitude to French Reading Comprehension (QSAFRC)

The questionnaire was adapted from Osikomoya (2012). It consists of two sections. Section A sought demographic data of the students (name of school, age, class, sex etc.) While section B contained 20 items which sought information on students attitude to reading comprehension in French language. The questionnaire is of the modified likert type with four scales of: Strongly Agree, Agree, Disagree and Strongly Disagreed. The questionnaire will br scored as follows: For positively framed statements: Strongly Agree = 4, Agree = 3, Disagree = 2, Strongly Agree =`1

The questionnaire was given to given to experts in language experts to determine its suitability for the study. The corrections from them helped to determine face and content validity. The reliability of QSAFRC was ascertained by administering it on the SSII students in a school that would not be part of the schools to be used for this study. Cronbach alpha was used to determine the reliability and value of 0.81 was obtained.

Test of Students Knowledge of Vocabularies.(TSKV) was self -designed instrument to test the vocabulary knowledge of the students in French language. The instrument contains twenty French vocabularies extracted from the passage appeared to be difficult based on the initiation of the researcher. To ascertain the reliability of the instrument, it was administered on the another group of SSII students that did not form part of the sampled population. Test- retest reliability formula was used to test the reliability of the instrument and reliability index of 0.82 was obtained.

Results

This section presents the result of the research carried out on attitude and vocabulary knowledge as predictors of senior secondary school students' achievement in French reading comprehension in selected secondary schools in Ibadan Metropolis. Three research questions were raised and answered. The data collected were analyzed using frequency count, percentage, PPMC and Regression Analysis. The summary of data analysis shall be discussed under the sub-headings; i. Social demographic characteristic data ii. Analysis of research questions.

Socio-Demographic Characteristics of Respondents

A total number of 95 Senior Secondary School Students randomly selected from seven Schools in Ibadan Metropolis participated in the study. Seven Senior Secondary Schools that offer French Language as a subject were purposively selected while the researcher used simple random sampling technique to select 95 Senior Secondary School Students who participated in the study. The researcher sought the consent of the French Teachers in the participating Schools who assisted in administering the instruments on the learners.

Table 1. Distribution of School

Name of School	Frequency	Percentage
Baptist High School Saki	11	11.6
Baptist Medical Center Secondary School	11	11.6
Livingstone College of Arts and Sciences	10	10.5
Oritamefa Baptist Model School	19	20.0
Faith School and College	10	10.5
Christ The King Catholics College	20	21.1
Sharon Rose School and College	14	14.7
Total Number of Respondents	95	100.0

Table 1.1 implies that majority of the respondents were from Christ the King Catholics College.

Analysis of Research Questions

RQ_1: What relationship exists between the dependent variable (achievement in reading comprehension) and independent variables (Attitude to reading comprehension and vocabulary knowledge)?

Table 2. Inter-correlation Matrix of independents and dependent variable

Variable	Achievement in reading comprehension	Attitude to reading comprehension	Vocabulary knowledge
Achievement in reading comprehension	1		
Attitude to reading comprehension (P value)	.471** .000	1	
vocabulary knowledge (p value)	.356** .000	.816** .000	1
Mean	27.72	26.57	27.52
Std. Deviation	4.15	4.99	4.94

Table 2 showed that: there was a significant positive relationship between the dependent variable (achievement in reading comprehension) and independent variables (Attitude to reading comprehension and vocabulary knowledge). That is, Attitude to reading comprehension (r = .471, N = 95, $p < .05$) and vocabulary knowledge (r = .356, N = 95, $p < .05$), and Biogenetics factors (r = .344, N = 250, $p < .05$). It implies that, there was a significant positive relationship between the dependent variable (achievement in reading comprehension) and independent variables (Attitude to reading comprehension and vocabulary knowledge).

RQ$_2$: What is the joint contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension?

Table 3. Summary of Regression Analysis of the combined prediction of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension

.R	R Square	Adjusted R Square	Std. Error of the Estimate			
0.473	0.224	0.207	3.69819			

SUMMARY REGRESSION ANOVA

	Sum of Squares	Df	Mean Square	F	P	Remark
Regression	362.639	2	181.320	13.258	0.000	P < 0.05 Sig.
Residual	1258.245	92	13.677			
Total	1620.884	94				

Table 3 showed that there was a joint contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension. That is achievement in reading comprehension correlated positively with the independent variables (Attitude to reading comprehension and vocabulary knowledge). The table also shows a coefficient of multiple correlations (R) of 0.473 and a multiple R square of 0.224. This means that 20.7% (Adj. $R^2 = 0.207$) of the variance in the students' achievement in reading comprehension is accounted for by the independent variables, when taken together. The significance of the joint contribution was tested at $p < 0.05$ using the F- ratio at the degree of freedom (df- 2/92). The table also showed that the analysis of variance for the regression yielded a F-ratio of 13.258. This is tested at significant at 0.05 level.

RQ$_3$: What is the relative contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension?

Table 4. Relative contribution of the independent variables to the dependent variables (Test of significance of the regression coefficients)

Variable	Unstandardized Coefficients		Standardized Coefficients			
Model	(B)	Std. Error	Beta	T	Sig.	Remark
Constant	17.744	2.217	-	8.004	.000	-
Attitude to reading comprehension	.448	.132	.538	3.390	.001	P<0.05(Sig.)
Vocabulary knowledge	.070	.133	.183	2.522	.033	P<0.05(Sig.)

Table 4 reveals there is a significant relative contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension, expressed as beta weights. There is correlation coefficient of Attitude to reading comprehension and vocabulary knowledge on the dependent variable (students' achievement in reading comprehension). Using the standardized regression coefficient to determine the relative contributions of the independent variables, attitude to reading comprehension ($\beta = 0.538$, t = 3.390, p < 0.05) indicates most potent contributor to the prediction, follow by Vocabulary knowledge ($\beta = 0.183$, t = 2.522, p < 0.05) which has relative contribution to the achievement in reading. reveals there is a significant relative contribution of Attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension, expressed as beta weights. comprehension. It implies that there is a significant relative contribution of attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension.

RQ₄: Which of the two factors would predict students' achievement in reading comprehension in French language?

Table 5. The most predictors of the two factors attitude to reading comprehension and vocabulary knowledge to students

Model	(B)	Std. Error	Beta	T	Sig.
Attitude to reading comprehension	.448	.132	.538	3.390	.001
Vocabulary knowledge	.070	.133	.183	2.522	.033

Using the standardized regression coefficient to determine the relative contributions of the independent variables, attitude to reading comprehension ($\beta = 0.538$, t = 3.390, p < 0.05) indicates most potent contributor to

the prediction, follow by Vocabulary knowledge ($\beta = 0.183$, t = 2.522, p < 0.05) which has relative contribution to achievement in reading comprehension. It implies that Attitude to reading comprehension predict students' achievement in reading comprehension in French language

Discussion

The findings revealed that there was significant positive relationship between the dependent variable (achievement in reading comprehension) and independent variables (attitude to reading comprehension and vocabulary knowledge). The findings corroborate the submission of Bernhardt (2005) and Wang (2009) that says that knowledge of words is a determining factor in language proficiency and success in affinity with comprehension of text.

The findings of Tannenbaum, Torgenson and Wagner, (2006) and Shiotu and Weir (2007) also attested to the fact that there is relationship between vocabulary knowledge and reading comprehension . The strength and viability of the knowledge of vocabulary and attitude to reading comprehension cannot be under-estimated since various findings have established the link between these variables of interest in this study. Adequate attention should be focused on them by practicing foreign language teachers in the course of teaching –learning process.

The findings of this study also revealed the joint contribution of attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension. This confirms the findings of Lawal 2008 that states that deficiency in reading comprehension is not dercernible in students but they have negative habits of reading widely which otherwise translates to the fact that reading culture is lacking in the students . Bernhardt (2005) and Wang, (2009) also affirmed that knowledge of words is a determining factor in language proficiency and success in academic pursuit because of its close affinity with comprehension of text.

The findings of this study also affirmed that there is a significant relative contribution of attitude to reading comprehension and vocabulary knowledge to students' achievement in reading comprehension. These findings corroborate the submission of Snow (2002) that found that there is strength of relationship between vocabulary knowledge and reading comprehension. This submission also correlates with the findings of Gelderen (2004) which concluded that there is significant relationship between vocabulary knowledge and reading comprehension

.The findings of this study also revealed that attitude indicates more potent contribution to the prediction. The findings of Lawal (2008) affirmed that students cultivate negative attitude to reading even though they might

not be deficient in reading. This submission portends a change in attitude towards reading comprehension because reading is strong determinant of academic success.

Conclusion

This study was conducted to determine the relationship between the attitude of students to reading comprehension and vocabulary knowledge and their achievement in reading comprehension with particular emphasis on French Language as a foreign language in Nigeria. There was a significant positive relationship between the students' attitude to reading comprehension and vocabulary knowledge and their achievement in reading comprehension. Attitude to reading comprehension present more potent contribution to reading comprehension than vocabulary knowledge.

Recommendations

1. French language teachers should pay maximum attention to the variables of attitude to reading comprehension and vocabulary knowledge because they have significant positive relationship with the achievement of students in reading comprehension.
2. French language teachers should help ameliorate the attitudinal disposition of the learners of French to reading comprehension in French language. The teachers of French language could adopt appropriate instructional strategies or motivational techniques that could impart positive attitude into the learners.
3. French language teachers need to work assiduously to improve on the vocabulary knowledge of learners as this could constitute constraints or impediments to attaining competence in reading comprehension.
4. Stakeholders in foreign language education should organize workshops, seminars and conferences that would enlighten the in-service teachers on the influence of attitude of learners to reading comprehension and vocabulary knowledge on their achievement in foreign language reading comprehension.

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THE CONTRIBUTION OF TRANSNATIONAL LEARNING TO THE PROFESSIONAL DEVELOPMENT OF TEACHERS

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ABSTRACT

The study analyzes the concept of transnational learning in the context of professional development for teachers. The aim of the study is to theoretically reflect on transnational learning as a tool for the multi-dimensional professional development of teachers in the 21st century.

One of the goals defined by UNESCO to be reached by the year 2030, is improved quality of education and lifelong learning, including teacher professional development. Teacher Professional Development Forms develop and change both vertically and horizontally, from passive to active solution search, experience-based learning.

The study examines the professional growth of adults in 3 different theories: Kegan constructive-developmental theory, Drago- Seversone learning-oriented model for school leadership and Nonaka and Takeuchi SECI organizational knowledge creation theory.

The authors' conclusions on transnational learning as a tool for teacher professional development are based on the findings of, Bruno-Jofré, and Johnston, as well as Johnson and OECD. As well as researching previous studies on transnational learning available on the Ebsco and Web of science websites.

Methodology: In the process of research, using the method of analysis of scientific literature, conclusions have been drawn on the transnational learning role in the professional development of teachers.

Keywords: professional development, adult education, transnational learning.

Introduction

In pedagogy, there is always a topical question of how to transfer knowledge, skills, values, how to develop personality and create such conditions for growth that meet each person's needs. Today, this question has become more urgent than ever, as the world is changing very rapidly, and so is the society, its values, and needs. This is also confirmed by

the goals set by UNESCO to be achieved till 2030, one of the seventeen goals being targeted towards qualitative education, meaning – "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNESCO, 2019) (OECD, 2019). However, education and educators do not adjust fast enough to meet all requirements. For many years' professional development of teachers was organized as the transfer of additional knowledge and information to teachers, however, the issues to be solved nowadays require other competencies and other teacher's abilities. Everyday life is volatile, uncertain, complex, ambiguous (VUCA) (Fadels, Bialika, & Trilings, 2017), (Reimers, 2016), so the teacher must learn as they do, learn to help himself.

Teachers' knowledge and the need for a change in the nature of the profession were discussed in the OECD Educational Research and Centre for Educational Research and Innovation (CERI) conference "Teachers as learning specialists – implications for Teacher's pedagogical knowledge and professionalism" in Brussels, 2014. Pedagogical knowledge, that is, knowledge of teaching and learning refers to the specialized body of knowledge of teachers for creating effective teaching and learning environments for their students. There is an agreement that competence in teaching requires a high level of pedagogical knowledge, but there is still a need to assess teacher knowledge as the outcome of the teacher education system and as a predictor of effective teaching and student achievement (Paniagua & Istance, 2018, p. 15). The function of teachers has switched from being a subject matter expert who transmits information and explicit knowledge to act as a facilitator of student learning in this society. Current reforms emphasize that teachers develop students' skills in problem-solving, learning to learn, reflective thinking, teamwork. And one of the key questions of Innovative Pedagogy is – what is desirable for users (both students and future employers) (OECD, 2016)?

Teachers and schools live in a society, which requires that they be adept at the same skills they are developing in their students (Herman, 2018). "The Quality of the teaching workforce has the depth for student outcomes, as empirical research has shown that teacher quality has an impact on student achievement" (Guerriero, 2017) (Guskey, 2002). It means that there must be growth and development in teachers, their visions of the world, its cognition. "Today Teaching is treated as a career expressed by learning and life-long professional development" (Zamir, 2018). Well-known lectures and seminars are no longer able to provide teachers with the necessary support. New approaches, methods, forms are needed, ways of increasing their inner capacity, developing personal qualities. Teacher Professional Development Forms develop and change vertically and horizontally, from passive to active solution search, experience-based learning (Révai, 2017).

"Teachers should have opportunities for the creation and development of professional knowledge that includes 'unsystematized' personal experience, knowledge derived from practice settings, and propositional knowledge" (Day, 1999). Teachers must be ready to solve problems in the course of work and to live and learn simultaneously. One of the ways that meet the needs is the mutual assistance of teachers to each other in the classroom, professional groups, world. Also, in the professional further education of teachers, innovative pedagogical approaches and techniques, one of which is experience-based learning, must be taken over (OECD, 2016). "Professional Development (PD) models fall on a continuum from highly adaptive to highly specified" (Koellner & Jacobs, 2015). In addition, being aware of the high demands on teacher competence both from the society, from parents, and from the pupils (OECD, 2019) the different life and professional experiences of teachers, the offer and opportunities of professional growth should also give the teacher positive emotions, wellbeing, a chance to restart and recharge. Globalization has opened the world and allowed people to connect in new and exciting ways. We create unique systems that are developed through our life experiences and passions. Combining experience-based learning and globalization leads to transnational learning and education.

Adult learning theories and models that justify the contributions of transnational learning

One of the theories on which the authors base their argument is developed by Robert Kegan, growth psychologist, professor at Harvard University. Based on Piagets opinions on child development, Kegan has created a theory that covers human growth throughout the whole life. The Kegan theory – constructive – developmental theory – basically explains how we, as adults, are creating something of importance in terms of cognitive, emotional, interpersonal and human personal experiences. Kegan does not think that development is the accumulation of new knowledge, but rather the change of way of acquiring knowledge, changing perception and explanation. The main focus of Kegan's theory is "the evolution of consciousness, the personal unfolding of ways organizing experience that is not simply replaced as we grow but subsumed into more complex systems of the mind" (Kegan, 1982). This theory offers a variety of principles of understanding and supporting growth in adults, who have different life experiences and world perceptions, considering current events: adaptation challenges, power, responsibility, uncertainty, complexities, growth-enhancing environment. Kegan`s constructive – developmental theory offers the structure of individual meaning building systems. It also covers

the way we think of an environment for learning that can contribute to growth.

The way humans acquire knowledge or dominant thinking determines how each new experience is perceived and how it is interpreted. It's like a window through which we look at the world, others and ourselves. Kegan divides adult development into 5 levels:

- Impulsive mind,
- Imperial mind,
- Socialized mind,
- Self-Authoring mind,
- Self-Transforming mind (Kegan, 1982).

To promote growth, we first need to understand what kind of knowledge acquisition way the adult is using. Only then it`s possible to decide what support, what methods and techniques to offer for each adult's growth, so that they can feel safe: feel like they are accepted just the way they are, not "forced" to change, that the type of growth is appropriate to the abilities and desires, with enough opportunities and challenges to create a more effective development context.

Creating learning activities, initiatives that support, promote adult development at both professional and personal levels – it gives ideas on how to increase capacity, how to think, communicate on development.

Drago-Severson has developed a practical model based on Kegan's theory, which she describes as follows: "Constructive-developmental theory emphasizes the qualitatively different ways in which we, as human beings, make sense of our own experiences and the world, and it emphasizes that all people can continue to grow, learn, and develop throughout their lives" (Drago-Severson, 2012, p. 22). In Core Elements of Learning Environments for Leadership Development, Drago- Severson identifies four ways of perception of the world, typical of adults, describes supports and challenges that can be infused into pillar practices to promote growth in adults with different ways of knowing.

Drago – Severson at the center of her model puts care (honestly valuing aspects of a person and focusing on that person's well-being), respect (seeing and acknowledging individuals' rights), trust, collaboration (engaging, having connected conversations, to work together) and intentionality (being purposeful about environments, forms) (Drago-Severson, 2012, p. 61). Concerning the professional development of teachers, opinions on the importance of the environment as well as on pillar practices are particularly relevant. These pillar practices – teaming, providing leadership roles, engaging in collegial inquiry and mentoring – are methods that help to grow and support adult's internal capacities (Drago-Severson, 2009). Of course, these methods can also be implemented within the school, but they

are much more effective in other environments that transnational learning can provide.

Another adult development model – a dynamic model for measuring knowledge level of organizations based on Nonaka and Takeuchi Model (SECI- (socialization-externalization-combination-internalization). Model covers the necessary four dimensions of knowledge "knowledge volume" the amount of knowledge), "knowledge value" (the importance and weight of existing knowledge), transformation speed of different types of knowledge" (the transformation of different kinds of knowledge) and "knowledge advantages and expenses" (the production expenses and transfer of knowledge and their interests) (Nezefati, Afrazeh, & Jalali, 2009). This model can explain varied scenarios and policies of knowledge management.

Theory talks about what to know, how to understand, what is socialization, how to share knowledge, how to use knowledge, and who has the right to do so. The two most complex steps in knowledge transformation include changing the type of knowledge – externalization, transforming tacit knowledge into explicit, and internalization – transforming explicit knowledge into tacit. These two steps require a great deal of personal involvement and usually include mental models, personal beliefs and values, as well as a change of perception of yourself, your group, and your entire organization. Creating knowledge is not a linear, sequential process. It is rather determined by the continuous and dynamic interaction between implicit and explicit knowledge.

Theories show that adult education is valuable for both the individual and the organization, if it is transformative, which can be achieved if the individual is actively involved in the process of acquiring knowledge.

Studies and conclusions on transnational learning

In 1999, the European Network on Teacher Education Policies (ENTEP) started a conversation on a term called European Teacher. Easy Mobility as a benefit of the EU was also examined. It was acknowledged that both physical and virtual collaboration between the pupil and the teacher, not only when studying what`s necessary for lessons, but also getting to know the language, culture, and diversity of people, is one of the ways to promote teachers' professional development and the quality of education in general (European Commission, 2018). "A European Teacher who has experienced the value of mobility encourages students to develop this general culture, along with a critical perspective, so that they may become autonomous, responsible and active citizens. This culture forms the basis for the acquisition of skills that enable students to move around, live and work in different European cultures. As well as familiarity with different

cultures, a European Teacher also needs to be able to analyze complex intercultural issues in order to enhance cross-cultural learning processes" (Schratz, 2014).

Most of the European education development policies are focused on higher education, Ph.D. students and university lecturers, however, contribution to the professional development of teachers after formal education was also considered. "Raising teacher education quality so as, in turn, to raise the quality of education and training in the European Union in a way that responds to the challenges of lifelong learning in a knowledge-based society" (European Commission, 2018).

Transnational teacher education programs are growing very quickly, and UNESCO considers that there "exists a lack of comprehensive frameworks for coordinating various initiatives at the international level" (OECD, 2005, p. 4) (Lancrin, 2004). Not only European countries are interested in transnational teaching, but it is topical all over the world. There is a lot of talk about it at the theoretical level, but there is not much practical experience yet, UNESCO explains this that "transnational teachers education is still too recent and too small phenomenon" (OECD, 2005, p. 13). There is no unified approach to terminology yet, all transnational learning, transnational education, cross-border education, borderless education, and cross-cultural education are used.

If we look at the researches posted on Web of Science and Ebsco with the keywords Transnational learning and professional development, these are basically social studies: Training of migrants, bilingual learning. Looking at the research done in transnational education (TNE) with the focus of professional development, the range of studies also is small: Ebsco – 24 articles, Web of Science – 35. The leading positions include Australia and England and the United States. In Europe, there are very little researches to be found with these keywords. The existing researches are mainly about higher education, which includes research on growth in student mobility (Hussin, 2007), education of university teaching staff (Smith, 2009), success/failures of different programs in a specific country (Kun, 2019). Researches on schools describing the experience of specific schools in hosting students, as well as the individual cooperation of teachers in some context of the subject (Erixon & Wahlström, 2016). Some researchers have also focused on education affecting migrants (Shibao, 2010), pre-primary education, and theoretical issues such as, how TNE develops leadership or how to build Curriculum focusing on TNE (Clarke, Johal, Sharp, & Quinn, 2016). And there are just a few studies related to the professional development of teachers, through using TNE. One of the researches is Janelle M. Johnson's "Mapping a New field: Cross-border professional development for teachers" (2011). In it, the author points out that "teachers'

education in any society is based on a critical stance that extends far beyond the aims of mere 'tolerance' and 'management' of diversity. This position also recognizes that teacher learning occurs in both formal and informal contexts and must occur longitudinally in order to be effective" (Johnson, 2011, p. 127). Johnson also acknowledges that transnational education is booming, but research is scarce in proportion. One of her dissertation questions is: "In what ways is cross-cultural professional development for teachers a transformative process for the teachers, their schools, and the communities in which they work?" (Johnson, 2011, p. 120). Lancrin believes that "Cross-border education can be a good capacity development tool for developing countries, for their tertiary education system but also, more broadly, for their economy" (Lancrin, 2004, p. 36), and. Yvonne Hebert (Bruno-Jofre & edit., 2014). Teacher Education in a Transnational World offers a genuinely international interdisciplinary examination of the challenges and opportunities associated with teacher education in the twenty-first century. However, the answer is not unambiguous, the result is influenced by many factors that are still awaiting their research. Arizona University scientist concludes in her dissertation that listing all the benefits of transnational learning is a difficult task: "The cross-border experience in itself was often salient for learning; there was an amazing range of potential outcomes during such experiences aside from the stated program content, and learning was multidirectional" (Johnson, 2011, p. 53).

Conclusions

In the 21st century, with the rapid development and transformation of both public values and needs, educational development, quality is very important, but it is not able to change fast enough. Teachers' further education with traditional methods does not provide the necessary growth. Scientists' findings suggest that adults are more effective in learning new things when they think about their past experience: personal and professional, and the opportunity to train in a team, taking a leadership role, learning under the leadership of a mentor, or watching and interviewing colleagues. Transnational learning is developing very rapidly, and more and more teachers use this method. The first research shows positive benefits but also marks dangerous aspects. Research in this area is needed to draw objective conclusions.

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SUPPORT TEAM FOR CHILDREN WITH SPECIAL NEEDS IN LATVIAN SCHOOLS

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ABSTRACT

By analysing the challenges of special education in the 21st century, it has been concluded that implementation of an inclusive approach in general education schools is one such challenge. An important element of developing an inclusive education system is the support team at the school.

The aim of this article is to describe the currently available personnel, and the personnel necessary for education and support of children with special needs in the educational process. We will analyse the education of the personnel involved regarding the requirements of special education, the existence of support teams and the specialists involved and needed, comparing the experiences of general education and special education schools.

For this descriptive design empirical research, we have used data acquired by surveys and used methods of descriptive statistics to process the answers.

Research results indicate the need for widening the access to professional development programmes for pedagogues in the field of special (inclusive) education to strengthen the professional competence of pedagogues. The survey shows that currently in Latvian schools the subject teachers are the ones that largely contribute to the support activities (e.g., preparation of suitable learning materials) and greater support has been requested regarding accessibility of learning materials, as well as a wider range of available methodical materials.

Keywords: inclusive education, school support team, supporting personnel, child with special needs.

Introduction

In Latvia, until the 1990s, general education institutions had no unit for school support personnel, and only the help of a speech therapist was available to the youngest pupils. It was not until the 21st century, when Latvia started to move towards an inclusive approach, that general education schools began creating permanent support personnel positions, such as school psychologist, special educator and social pedagogue. Research indicates that a support team is a formation element of an inclusive education system (Barrow, 2013; Rozenfelde, 2016; Tūbele & Vīgante, 2014) and, furthermore, it is a significant support factor in teachers' professional activity.

The aim of the article is to describe what personnel is available now, and what kind of personnel would be needed for the education of children with special needs and for providing them with support during the educational process.

The article analyses the current situation in Latvian educational institutions, both in general and in special schools. It analyses the education of the personnel involved in the field of special education, the presence of a support team, and the specialists involved and needed, comparing the experiences of general and special schools. This article was prepared during the Study on the Financial Model for the Education of Children with Special Needs in Latvia, conducted by Raščevska, et al, 2017. The research was carried out by scientists from the University of Latvia under the order of the Latvian Ministry of Education and Science from May 2017 until December 2017.

Methodology

In order to collect data for the descriptive design empirical research, we have used data acquired by survey and methods of descriptive statistics to process the answers

The survey of teachers from general education institutions (TGEI) had 280 respondents. Since there was a significant number of school management representatives in this sample, this sample was categorised into two subgroups: teachers (211 in total) and school management representatives (69 in total).

Two hundred sixty-three respondents participated in a survey of teachers from special education institutions (TSEI).

The results of the survey may be influenced by the level of training of the respondents in the field of special education. Many teachers (48%) note that they have no education in this area. Only 15% of teachers indicate

that they have a special teacher/pedagogue or speech therapist education (obtained at bachelor or master level). Approximately 30% of teachers have completed a 72-hour course training in special pedagogy. Furthermore, most of the teachers who chose the *Other education* response (7%) indicate either a smaller extent of special course training or that they are studying in that field.

Research questions:

1) Are there any support personnel teams in special and general education schools?
2) What specialists are involved in the teams?
3) What kind of specialists would be needed for the operation of a support team?
4) What is the frequency of team meetings?

Literature Review

A support team should provide support for the classroom teacher, help reduce the difficulties a pupil may face in the classroom or outside the class hours, and support pupils as well as parents. Researchers point out that the lack of professional support in educational institutions can lead to a crisis, given that the personnel of the educational institution do not understand what to do in difficult situations (Giangreco, Suter, & Hurley, 2013).

If there is a support personnel group in an educational institution, it does not automatically lead to teamwork. Poorly coordinated and individual work of even highly professional specialists in various fields does not lead to the expected result.

An essential aspect of the support team work is the cooperation and collaboration of specialists and subject teachers. Research on pedagogue collaboration with a special education teacher shows that many teachers consider working with support personnel as an interference in their work, as a burden rather than help. Situations where the support teams were given an official time for planning, discussion, and evaluation were assessed as positive (Lacey, 2001; Milteniene & Venclovaite, 2012). This indicates the need to provide time resources for teacher collaboration with the support team.

A team is characterized by united management, common goals, mutual cooperation, and conditions of confidentiality (i.e., when team members share information while solving problems, the boundaries of confidentiality are widened but not broken since no information is disclosed outside the team).

Optimally, the support team consists of a member of administration (deputy director, educational methodologist, director), a psychologist,

a special pedagogue/teacher of special education, a social pedagogue, a speech therapist, a teacher's aide, a medical worker, and a teacher (class teacher, subject teacher), while parents are also invited to attend the meetings.

Work of the team involves close collegial cooperation in defining a problem (such as a pupil's difficulties in the learning process), putting forward hypotheses, discussing solutions, elaborating a detailed plan for the activities of each party involved, and setting deadlines for evaluating the decision, adjusting the action plan if necessary (Newton, Todd, Algozzine, Horner &Algozzine, 2009).

The task of the support team is to develop pupils' individual development plans, meet regularly, support and monitor the implementation of the plan, analyse the effectiveness of plans, manage the resources of the school and community that need to be used, report to the school administration on the trends of the support domain, make proposals for the school development plan, and support pupils, teachers and parents.

Results

One of the areas of working with special needs pupils is the mutual collaboration of school personnel, that is the creation of a team within the school dedicated to work with special needs pupils.

A comparatively positive experience of setting up school teams in educational institutions is evidenced by the survey results, which indicate that, in most schools, such teams have been created. However, 14% of general education institution management representatives say that no such team has been set up in their school. Whereas among the surveyed pedagogues this answer was provided by 9% of general education school pedagogues and 4% of special education institution pedagogues.

By studying the experience of the schools surveyed, it can be concluded that a large number of Latvian schools have established rules of procedure for their school support team, which are also available on their school websites.

Among those surveyed, 45% of general school management representatives, 29% of general school pedagogues and 41% of special education pedagogues report that they regularly work in a support team (see Figure 1), while around 30% of respondents in all groups report that they work in a support team if necessary.
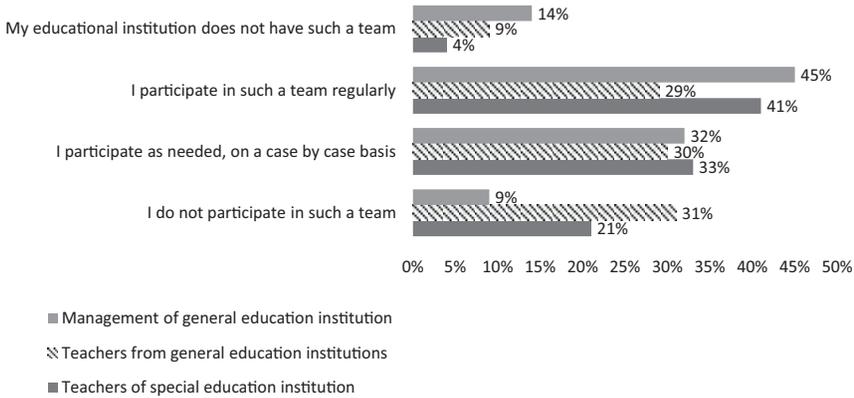
Figure 1. Participation in a team dealing with special education issues

The results of the survey on what kind of specialists participate in school support teams indicate that the most common team members are a speech therapist and a psychologist (see Figure 2). However, other specialists are indicated varyingly: 57% of TGEI survey respondents report that their team has a class teacher, and 65% of TSEI survey respondents provide this answer.

There was a greater number of special pedagogue and medical personnel among teams in special educational institutions. This is to be expected because, when implementing a special education programme, recruitment of such specialists is greater. This fact has to be taken into account, implementing the integration of special needs learners in general education schools will require greater availability of these specialists.
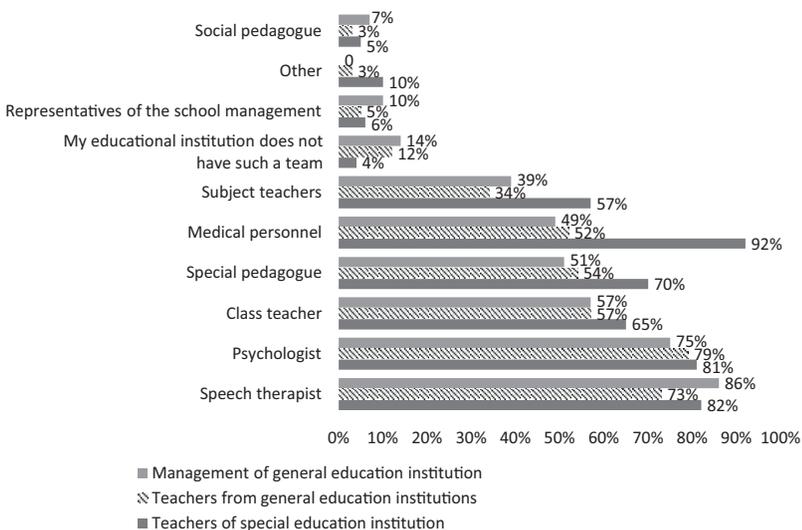
Figure 2. Specialists working in support team

A wider range of additional personnel in educational institutions that implement special education programmes is also evidenced by the results of the TSEI pedagogue survey where pupils with special needs have access not only to a speech therapist, psychologist, nurse, social pedagogue and special pedagogue, but also, for example, a teacher aide, therapeutic exercise teacher, doctor, canistherapist, masseur, music therapist, or motion therapist.

Educational institutions have different experiences in setting up support teams, thus suggestions on what additional specialists need to be included in such a team are also very different. Only 7% of school heads say that all specialists are already involved. Most frequently the respondents indicate that the team should include a special pedagogue (see Figure 3). Respondents of the TSEI survey indicate that it is important to include a psychologist (36%) and a class teacher (29%). It is noteworthy that in the TGEI survey, 32% indicate that the team should include medical personnel. All respondent groups report a subject teacher's participation in teamwork.
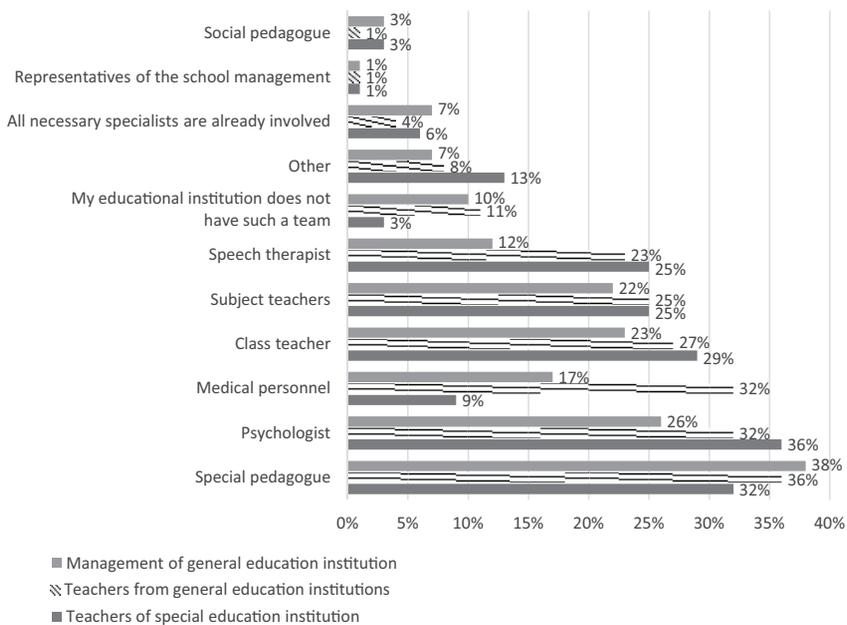
Figure 3. Specialists needed in support team work

The rules of procedure for each school support team may define varied team functions, however, the most frequently stated is individual programme planning. School management representatives and participants of the TSEI survey, 61% and 56% respectively, indicate that they decide on the choice of support measures. The third most important function mentioned in

the survey responses is the creation of a research/diagnosis plan. It can be concluded that the support team work is more related to support planning, rather than the analysis function which is performed much less frequently: 33% of pedagogues and 39% of management representatives indicate that they perform evaluation of development progress. However, this would be an important step in determining the effectiveness of support measures and in planning further support. It is possible that support teams have not yet established a culture of feedback analysis, they focus on first-time case consideration and planning, leaving evaluation up to the subject teacher. It can also be related to limited time resources.

The irregular frequency of the support team meetings on joint work is demonstrated by a survey in which 26% of the educational institution management representatives indicate that the team meetings are held once or twice a month, and 48% hold the meetings around a few times a semester (see Figure 4). Pedagogues indicate a lower frequency of such meetings.
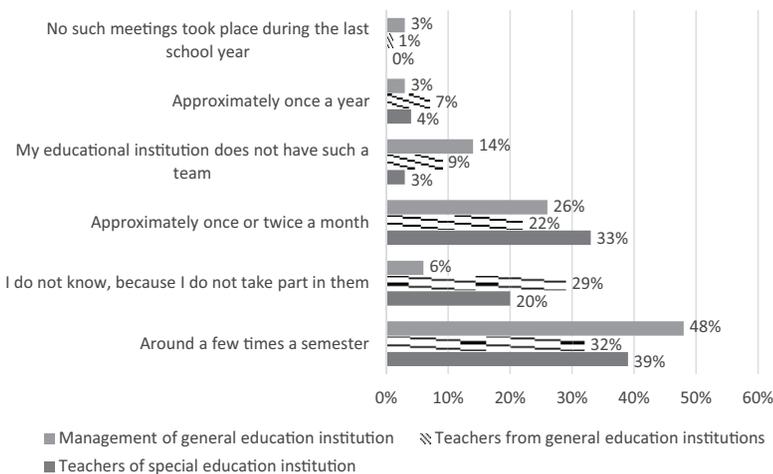
Figure 4. Frequency of team meetings

When it comes to supporting pupils with special educational need, an important element is selecting and creating teaching materials appropriate for the pupil. The results of the TSEI survey indicate that this function is most often carried out by the pedagogues themselves: 63% indicate that they prepare the materials themselves and 64% adapt the study materials or search the Internet.

Individual preparation of teaching materials is an additional task for the pedagogue; therefore, it is important to strengthen the cooperation among teachers, the involvement of support personnel and the use of resource centres. Regarding support needed for the pedagogues themselves in terms

of methodology, 59% of pedagogues and 74% of school management point out that the most needed are ready-to-use methodological materials and a wider range of methodological materials. Regarding personnel, pedagogues also express the need for a second pedagogue in the classroom (32%), a teacher aide (51%), or the opportunity to invite a special pedagogue (22%).

Respondents expressed the need to strengthen the professional competence of pedagogues as well; they need easy access to pedagogical literature (14% of pedagogues), the opportunity to consult on topical issues at school (14%), regular attendance of further education courses (26%), and additional knowledge on the special needs of each pupil (49%). Likewise, pedagogues point to the need to use technical aids (38%) and to adapt premises (30%). Various external (financial, technical) resources are required to provide such support, but mutual collaboration between teachers in a support team can also contribute to addressing the issues identified.

Conclusions and Suggestions

The results of the research indicate the necessity to provide as broad access as possible to pedagogical professional development programmes in special (inclusive) education in order to strengthen the professional competence of pedagogues. The results of the pedagogues' survey illustrate that pupils with SEN and the teachers themselves do not always receive the necessary support and deal with issues within their pedagogical competence.

In order to provide the SEN pupils with the necessary support in the learning process, schools create support teams whose activities are regulated by the educational institutions themselves, so the range of professionals working in these teams, the functions performed, and the regularity of team cooperation vary. In order for the support team to be helpful to both the pupil and the teacher in the day-to-day learning process, there should be a regular cooperation of the team of specialists, that would not only be aimed at planning, but also at assessing the effectiveness of the support measures. The support teams in general education schools should have more involvement of special pedagogues, whereas in the support teams of special education institutions should have more social pedagogues and psychologists involved. It is advisable for the support team to include specialists such as a special pedagogue, social pedagogue, speech therapist, medical personnel representative, and school administration representative. For support in particular cases, the teacher of the particular subject and the class teacher should also be involved.

The work of the support team should take place on a regular basis, meetings should convene at least twice a month, if necessary, assessing, for example, the individual plan executed for the education programme acquisition of the learner. However, in cases, such as those with behavioural disorders, the monitoring of the plan should be more frequent. In turn, the everyday task of the support team specialists is to provide the pupil with diverse support and provide the pedagogue with methodological support.

A study on the cost model for support services for children with special needs in the context of inclusive education (Raščevska et al., 2017) concludes that the number of support personnel workers at an educational institution should be related to the number of pupils in that educational institution or in the Support and Counselling Centres serving these schools, setting certain regulations, for example, one psychologist per 600 pupils and one speech therapist per 200 pupils, as well as the number of special programmes implemented in the educational establishments with integrated children with special educational needs.

If the regulations would change to stipulate that the statements issued by the State Pedagogical Medical Commission shall be an administrative act, then the functions of the school support team would be to prepare and provide the support measures stipulated by these statements.

If it is not possible to ensure the availability of support specialists and support measures at each educational institution, such support teams can be formed according to the territorial principle, one per several educational institutions, by concentrating support specialist services at either the municipal or regional level, thus creating resource centres accessible to educational institutions and parents.

The results of the survey indicate that at the moment a large contribution in preparation of support measures (suitable study materials) is only provided by the subject teachers, yet the need is expressed for more support in the availability of study materials, in particular the ready-to-use methodological materials and a broader range of methodological materials.

In order to provide more targeted support to learners with special needs, especially when implementing the principle of inclusive education, there is a need for additional pedagogical resources, such as a second pedagogue in the classroom, teacher assistant, or external special pedagogue.

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GROUNDED THEORY METHODOLOGY FOR UNDERSTANDING HOW EQUINE ASSISTED LEARNING CONTRIBUTES TO ADULT LEARNING

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ABSTRACT

The aim of this article is to provide a theoretical review of Grounded Theory methodologies and their application in research, to understand how adults learn through guided human and horse interaction during an Equine Assisted Learning session. There are many debates about similarities and differences between Glaserian Grounded Theory (GGT), Strauss and Corbin Grounded Theory (SGT) and Constructivist Grounded Theory (CGT). All three approaches have been analyzed with the aim of understanding mutual similarities and differences between them, as well as understanding original ideas for conceptualizing these approaches and to select a Grounded Theory approach that best matches the research question – how adults learn when the learning takes place through guided human and horse interaction during an Equine Assisted Learning session.

Key words: Adult learning, Equine Assisted Learning, Grounded Theory.

Introduction

"The central question of how adults learn has occupied the attention of researchers and educaters since the founding of adult education as a professional field of practice in the 1920s" (Merriam, 2001, p. 1). As well as is one of the central questions in an emerging discipline named *Learning Sciences* (Fischer et al., 2018).

Adult learning is a extremely wide area of research and theory building. The knowledge and uderstanding about how adults learn is in the spotlight of practice development for adult education. There are many learning theories, but there is no one theory of adult learning that explains all that is known about adult learners, the process of learning, and the various contexts where learning takes place. Because *learning* is a complex process that can never be reduced to one simple explanation.

The notion *Equine Assisted Learning* (EAL) in academic literature is new and it appeared only at the beginning of the 20th century. EAL could be defined as an innovative learning practice where learning takes place

through guided human and horse interactions that offers an individual and unique learning experience. EAL practice has taken place in a variety of settings. Currently, there are several hundred programs across the world that utilize these programmes for different learning needs. It seems there are no bounds to the creativity involved when putting people and horses together for whatever reason. The positive outcomes that can be obtained from learning activities with horses are primarily illustrated through the marketing literature, and feedback from participants or practitioners. EAL practice is based on empirical work and is not theoretically founded in research data. There is a need to initiate scientific dialogue about the importance of learning in an EAL practice. The existing approaches and types of EAL points to the fact that this form of learning has a high applicability potential. *Learning* is a multidimensional phenomenon, the more we know about how adults learn in an EAL practice, the better we are able to structure EAL activities that resonate with those adult learners with whom we work. Nevertheless all EAL programs have one common feature – human *learning*. There is not one theory founded in research data that explains – how adults learn through guided human and horse interaction during EAL session and how this learning results (Gehtmane-Hofmane, Nīmante, 2015; Gehtmane-Hofmane, 2018; Gehtmane-Hofmane, 2019).

Aim of the Study – to do empirical research and investigate and develop an analytical framework for understanding how adults learn when the learning takes place through guided human and horse interaction, and describes the different perspectives on how this learning occurs and results. The research question "*how adults learn*" to be viewed in the framework of Equine Assisted Learning practice as a learning space, where primary learning takes place.

One of the study tasks and aims of this article – is to understand Grounded Theory methodologies and their application in research for understanding how adults learn when the learning takes place through guided human and horse interaction during EAL session. There are many debates about similarities and differences between Grounded Theory (GT) approaches. Three approaches have been analyzed with the aim of understanding mutual similarities and differences between them, as well as understanding original ideas for conceptualizing these approaches and to select a GT approach that best matches the aim of research.

Background

Grounded Theory (GT) is a qualitative research methodology, that focuses on generating theories from the data. GT offers analytical techniques for qualitative content analysis. There are three prevailing approaches:

Glaserian GT - originally developed by Glaser and Strauss (Glaser, Strauss 1967; Glaser, 2013), *Straussian GT* – originally developed by Straus and the latter co-developed with Corbin (Strauss, 1987; Straus, Corbin, 1990, Corbin, Strauss, 2015), and *Constructivist GT* which was developed by Kathy Charmaz (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018). To select a Grounded Theory approach that matches the research question and the study's purpose, as well as the author's own perspectives and needs, an analysis has been carried out on all three Grounded Theory approaches. This article involves the analysis of primary data and academic literature written by leaders in the field of GT. Despite their divergence all three approaches claim the same origin and to embrace similar methodological techniques, but there are differences.

Differences and similarities relating to guiding theories and assumptions:

Glaserian GT based on critical realism, post – positivism and positivism, fostered orthodox view, mirrored a modernist epistemology and objectivist assumptions. *Straussian GT* based on positivist assumptions, is compatible with symbolic interactionism, pragmatist philosophical tradition, constructivist currents, assumed social constructionism approach in a more limited form and adopts a realist position. *Constructivist GT* based on constructivism, relativist epistemology, social constructionism, adopts a realist position, takes a middle ground between postmodernism and positivism, symbolic interactionist theoretical perspective (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser,. 2013; Strauss, 1987; Strauss, Corbin, 1990). Because of the differences, GT potentially offers methodologies for a variety of research and for researchers. Researchers with different worldviews, and different research questions, can chose a GT approach that matches their own perspectives and needs.

Differences and similarities regarding data collection and analysis: In all three approaches data collection and analysis proceeds simultaneously. The process of analysis is cyclical as is the process of data collection, coding, categorization and theoretical sampling. All three approaches offer constant comparative methods which involves making comparisions during each stage of the analysis to establish analytic distinctions. In a *Constructivist GT* approach data analysis begins to develop theories (explanations) that suggest further cases to sample and researchers can use GT strategies with a variety of data collection methods (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990). Across all GT approaches the data collection and analysis is systematic, and researchers may find it helpful particularly if they are new in using GT.

Differences and similarities regarding the character of data: In *Glaserian GT* and *Straussian GT* date is self-evident and speaks for itself. In a *Constructivist GT* data is a product of the research process, the research and the researcher co-construct the data. Data is a narrative construction, and reconstructions of experience to build data in an interactive and co-interpreted way (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990).

In *Glaserian GT* and *Straussian GT* external reality is independent from the researcher (Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990). In Constructivist GT external reality depends on interaction between the researcher and research participant. *Constructivist GT* represents research participants as the constructor of reality that serves as the data. Participants reflect experience and behave like "free agents" with their own needs and interests, as a unique and autonomous individual (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990)

Differences and similarities regarding role of researcher: In *Glaserian GT the* researcher stands outside the research process. The researcher is a passive, neutral observer who collects the facts but did not participate in creating the data. The researcher is "*tabula rasa*" (blank slate), a distanced expert generating a theory by careful application of all GT procedures minimizing human bias. The researcher should not impose their own views on the data and does not compose the story and their own experience on the data. Conceptualization into categories should also be abstract of researcher interpretation. The researchers experience may just be more data. He raises participants' perspectives to the abstract level of conceptualization and data and theoretical sensitivity is central (Glaser, Strauss, 1967; Glaser, B. 2013). *Straussian GT* strategies encourage the researcher to be do an active analysis of the data. According Strauss and Corbin (1990) the goal is for the researcher to increasingly possess "the attribute of having insight, the ability to give meaning to the data, the capacity to understand, and the capability to separate the pertinent from that which it isn't" (Strauss, Corbin, 1990, p.41). In *Constructivist GT the* researcher is a part of the studied process and research situations. The task for the researcher is to learn the methods by which participants construct their realities and to make further interpretations about this reality through critically examining their construction of the research process as they seek to analyze how their research participants construct their experience. The researcher makes an interactive impact on the data and co-composes the story. The story reflects the viewer as well as the viewed. The researcher develops and proposes

a new understanding and a novel theoretical interpretation of the studied field that reflects the experiences and interactions of the participants and the researcher. According to Charmaz (2006), the researcher constructs data through observations, interactions and materials about the topic or setting, empirical events and experiences and pursues hunches and potential analytic ideas about the data. The central focus is on action and experience from the experiencing subject perspectives, on mutual creation of knowledge by the researcher and the research, and on the interpretive understanding of the subjects' meanings (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018).

In all three approaches, the analytic process employed, prompts theory discovery and development rather than verification of pre-existing theories. They offer the same analytic strategies but differ a little regarding coding strategy and types of codes. For example; *Constructivist GT* has both initial codes and in-vivo codes. In-vivo codes are used for participant's special terms, it helps to preserve the participants meaning of their views. In-vivo codes serve as both symbolic markers of the participant's speech and meaning. Like any other code, these codes need to be integrated into the theory and they need to be subjected to comparative and analytic treatment. In all three approaches categories are building from these codes, but in *Constructivist GT* there is a much wider range of analytical categories. 15 analytical categories were identified: narrow categories, pre-conceived/pre-existing categories, subcategories, theoretical categories, core categories/general categories, major and minor categories, unintegrated categories, abstract categories, disciplinary categories, overlapping categories, potential categories, subsequent categories, low-level categories, conceptual categories and tentative categories (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990).

Differencies and similarities regarding provided guidelines: *Glaserian GT* provides directive instructions and a strong justification for inductive qualitative inquiry. *Straussian GT* provides semi-flexible instructions and offers guidelines for prescribed procedures in concrete ways. *Constructivist GT* provides flexible guidelines that allow the researcher to adopt the method for the study and the specificity of the phenomenon being studied. It also offers general principles rather that directive instructions and rules. No set of rules dictate when and what the researcher needs to do (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990).

Glaserian GT delays *a* lliterature review and the researcher should begin research without the guidance of pre-conceived questions and theory.

Straussian GT also advocates delaying the literature review to avoid seeing the world through the lens of extant theories, however it does allow the researcher to do research with the guidance of pre-conceived open questions. *Constructivist GT* disavows the idea that the researcher should begin their studies without prior knowledge and theories about their topic. The researcher must have prior knowledge and theoretical pre-conceptions regarding their research field (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990).

Glaserian GT and *Constructivist GT* deals best with the research questions "how" and "what", however *Straussian GT* deals with research questions "how", "why" and "what" (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990)

Differences and similarities regarding goals and some tenets. Glaserian GT generates formal or middle-range theories from the data and seeks explanations and predictions at a general level. This approach produces conceptually generated theory and examined hypotheses by measuring variables. *Glaserian GT* develops theories from research grounded in data rather than deducting testable hypotheses from existing theories. Led for valid instruments, procedures, replicable research designs, and verifiable quantitative generalizable knowledge - reducing qualities of human experience to quantifiable variables and to deal with facts rather than with what someone has said about them. *Straussian GT* generates formal, middle-range or substantive theories from the data. In generating substantive theory, it seeks theoretical interpretations or explanations of a delimited problem or theory applicable to a specific field. *Constructivist GT* generates a theory from empirical data through explanation and understanding at a general level and seeks to develop an interpretive understanding of the studied phenomenon. *Constructivist GT* focuses on the research process, which is characterized by partnership and collaboration and seeks to understand the subjective experience and described processes (Charmaz, 2000; Charmaz, 2006; Charmaz, 2014; Charmaz, 2018; Corbin, Strauss, 2015; Glaser, Strauss, 1967; Glaser, B. 2013; Strauss, 1987; Strauss, Corbin, 1990).

Conclusions

The Equine Assisted Learning process is characterized by partnership and collaboration and the *learning* process is based on action and experience from the experiencing subject's perspectives. Unlike *Glaserian GT* and *Straussian GT, Constructivist GT* offers a collaborative approach to the research process and knowledge building. It focuses on the research

process, which is characterized by partnership and collaboration and helps to understand the subjective experience of the research participants. It also describes the processes required to develop an interpretive understanding of the studied phenomenon from the perspective of a subjective experience. The data analysis and data collection are also subjective. *Constructivist GT* focuses on a mutual creation of knowledge by the researcher and research participant.

The *Constructivist GT* approach offers basic GT strategies with adopted *Glaserian GT* and *Straussian GT* methodological approaches and provides flexible guidelines that allow the researcher to adopt the method for the study and the specificity of the phenomenon being studied. Unlike *Glaserian GT* and *Straussian GT*, in *Constructivist GT* the data is a product of the research process, the researcher and research participants co-construct the data. Data is a co-construction and reconstruction of experience and depends from interaction between the researcher and research participant in the research process. The Equine Assisted Learning (EAL) process creates a learning experience that is a product of EAL and depends on the interaction between the horse, facilitator and the learner – (research participant). In both - EAL and *Constructivist GT* interactions, the experience, reflection and reflexivity are central. Unlike *Glaserian GT* and *Straussian GT*, the *Constructivist GT* approach emphasizes relativity not generality and reflexivity not objectivity and disagrees that the researcher should begin their studies without prior knowledge and theories about their topic. It means that the researcher must have prior knowledge and theoretical pre-conceptions about Equine Assisted Learning as the research field and adult learning as research topics. *Constructivist GT* deals best with research questions "how" and "what", for example – "how" adults learn, "how" this learning occurs and the results. Unlike *Glaserian GT* and *Straussian GT*, in *Constructivist GT the* researcher is part of the studied process and research situations. He or she has two roles - objective observer and active research participant with influence on the data and analytic processes. The researchers make an impact on the data and co-compose the story together with the research participant. It means that the story reflects the researcher as well as the research participant (learner) experience of learning within the Equine Assisted Learning sessions. Unlike *Glaserian GT* and *Straussian GT*, *Constructivist GT* represents research participants as the constructor of their own and unique reality, their needs and interests serve as the data. Either of the learning outcomes from Equine Assisted Learning sessions depends on the learner's experience, values, needs, interests and ability to learn.

Investigation of the Equine Assisted Learning process to understand how adults learn when the learning takes place through guiding human and

horse interaction and understand the different perspectives, for example, how research participants create the meaning of a learning situation, how this learning occurs and what results have strong constructivism leanings. Unlike *Glaserian GT* and *Straussian GT, Constructivist GT* offers basic GT steps and provides methodological guidance, that is flexible enough with enough explanation and suggestions, which could be used as a work guide in an organization of this study. *Constructivist GT* offers guidelines for anyone who has a basic knowledge of research methods. There is one more important aspect when choosing a *Constructivist GT* approach in this study, this is the lack of the author's experience in using this method.

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COLLECTIVE MUSIC MAKING AS A DEVELOPER OF A TEENAGE PERSONALITY AS A WHOLE

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ABSTRACT

The modern era of advanced technology places people at the computer, but practical action is what allows young people to learn, express and realize themselves. Collaborative skills are one of the most important lifestyle skills for preparing adolescents for life. The main idea of human interaction is to help the adolescent to develop, which is one of the main components of life activity. It is designed to develop initiative, self-control and self-assessment. Successful development of the social skills of pupils takes place in the interaction between pupils and the adults and pupils, themselves in the socialisation process: mutual perception, assessment and influence.

Children and teachers may face a number of challenges when they come to school: children have different degrees of readiness for school, lack of readiness for the new psychological role, varying motivation to go to school, different levels of skills and abilities, so it is important to bring these children together more and create a more enjoyable time for them at school. One of the forms of learning that unites children definitely is collective music making, because learners act as a single team for a single purpose, allowing them to get to know each other better and become more open.

The topicality of this research is indicated by the issue of promotion of self-realization of adolescents and development of creativity, which is actualized in pedagogy, because only such a personality in the future would be able to compete successfully in the labour market by generating and offering their ideas.

Methods: As part of the study, the authors conducted a survey of small music collectives' ensemble leaders, which helped to reveal the formation of the collective musical experience of the learners in creative activities, developing both socialization and cooperation skills, as well as promoting the possibilities of self-realization of the adolescents.

Keywords: collective music making, instrument playing, cooperation skills, self-realization.

Introduction

In a democratic society a human being is considered a unique value, living and learning among other human beings. The modern age of developed technologies forces the human being to sit in front of a computer, but it is the practical activities that allow the young people to learn something useful in their lives purposefully, deliberately and on their own accord, so they could express and realise themselves.

Collaboration skills are among the most essential life skills, necessary to prepare the pupils for their life activities. The main idea of Humanistic interaction is to get the student interested, provided him or her with an opportunity to discover and develop their own abilities, to continue to work independently, thus helping the student to develop, development being one of the main components of life activity. It is aimed at the development of initiative, self-control and self-evaluation. Successful formation of the students' social skills is achieved in the co-operation between the students and adults, as well as between the students themselves – in a socialisation process: mutually perceiving, evaluating and influencing (Gudjons, 1998; Matusov, 2009). A person cannot learn social skills without interaction with other people.

Studying the holistic development of the adolescent personality, one must understand the holistic approach in music pedagogy. Maruta Sīle connects the ancient Greek philosophy term "wholeness" to music in the following way: the human being develops and retains the unity of soul, mind and emotions in balance, for a harmonious personality, using the characterising elements of musical rhythm, melody, mode, harmony and other entities characterising the wholeness of music. This unites an individual with the wholeness of society, and then further with the united rhythm, harmony, order, spirituality and wholeness of the cosmos (Sīle, 2000).

Historical research of wholeness theory in the science of pedagogy revealed ideas that were accepted as the basis of the developed holistic approach from the perspective of the pedagogy of science:
- the holistic approach in the personality study assumes that elements of complex phenomena are connected and indivisible, and that changes in one element initiate changes in the rest of the whole. This requires the study of the whole instead of separate variables.
- complex pedagogic phenomena must be grasped as a whole;
- wholeness is something more than just the sum of its elements (Sīle, 2000).

Creation, performance and listening to music is made possible by musical experience. Although music is only perceived through sound and

listening, this experience is universal, as the whole of the human being is involved in it – the body, emotions, mind and soul are involved in its creation. Creation of musical experience through repeated listening to the music alone is insufficient, as full-fledged musical experience is connected with practical activity creating and performing music. Humans since the most ancient times have been using different instruments for the creation, preservation and handing down of musical experience, like – human voice, percussion, string, wind and – the much later created – keyboard instruments. Human life and the existence of musical culture today cannot even be imagined. For the instruments in a musical group to sound nice and full, it takes the long-term and patient joint work of both the student and the teacher. A musical group is a unique collective in which various individuals are connected in different contexts (Lim, 2014).

Entering a school, children and teachers may encounter several problems:

- the children can display different levels of readiness for school,
- lack of preparedness for the new psychological role,
- differing motivation to attend school,
- different levels of skills, abilities and also talent.

One of the forms of learning that definitely unites the children, is collective music-making, as the students operate as a united team, for one purpose, allowing them to get better acquainted and become more open. The ability to establish and maintain relationships with people not only enriches one's life, it is also a basic part of self-respect (Smita & Strika, 1998). While participating in a musical group, everyone also shows himself/herself as an individual (Murnighan, 1991).

The topicality of the research

The topicality of the present study is indicated by a question current in pedagogy and concerning the promotion of self-realisation and development of creativity of the adolescents, as only such a personality will be capable of competing successfully in the labour market, generating and offering unique ideas.

In order for an adolescent to develop as a competitive personality in the future labour market, it is important to establish the necessary personality traits that are stimulated by the process of creative education:

- a unique personality;
- a generally developed personality;
- a personality that can represent one's own new ideas;
- a competitive personality;
- a successful personality.

The age of adolescence has always been a difficult one. Because of the technological revolution and digital opportunities, the adolescents spend more and more time in the virtual world, adapting to other adolescents, replicating the actions of the idols of their age, adopting their behaviour, values and way of thinking, thus abandoning the originality of their own personality (Geidžs & Berliners, 1999). With all this taken into account, it is of great importance for the education of the adolescents to be the one ensuring that the adolescents preserve their uniqueness.

At the same time both practice and research shows that promotion of adolescents' motivation, their encouragement on the path to developing their musical interests is a real challenge for the leader of a musical group, as collective music-making requires perseverance, strict discipline, but is also forming the sense of social responsibility within the group. Collective music-making has a beneficial effect on the improvement of general social skills and co-existence, it raises the motivation for learning and attending extra-curricular activities, as it improves attention, organisation and self-analysis (Bonshor, 2018).

Playing musical instruments is the activity that offers the best opportunity for the development of artistic skills, emotionality and understanding of musical values a student has, simultaneously encouraging the development of musical intellect. The research by education researchers has proven that learning to sing, reading scores and playing an instrument can be a teaching method by which not only the students are introduced to the world of art, but it also develops those skills and potencies of the students that are useful for all other subjects, like mathematics or languages, thus providing an opportunity for the student's self-realisation (Fišers, 2005).

The teachers at Latvian professional music schools employ various exercise systems and methodological techniques in order to help the students to improve the technical elements of instrument playing and to acquaint them with the rich musical culture. In creatively organised study, students acquire knowledge about the expression of the musical language, stylistic, genre-specific and other characteristics of a musical piece.

Collective music-making is an important part of music education, influencing the comprehensive development of an adolescent's personality – it develops intellectual abilities and those of perception, emotional responsiveness to music, artistic fantasy and creativity that are substantial parts of any innovative activity of the 21st century (Kumik, 2017). This leads to the conclusion that both the individual and collective music-making skills are developed.

This statement is supported by the achievements of the most talented students of the Latvian music schools at local and international music competitions and festivals. There are many examples, it is important to

highlight just a few: Ēriks Katkevičs, a learner of the 8th violin class at the Jurmala Music School, won the 1st prize in the International Cote d'Azur Piano Competition of the Conservatory of Nice (France) (21–27 October 2018). Eduards Levša won Grand Prix at 36th Pärnu Accordion Music Festival in Pärnu (Estonia) on October 26, 2018, Sandija Leja won 1st prize at XIX Concours International de Piano in Paris, France, April 22–23, 2019 (Jūrmalas mūzikas vidusskola (Jurmala Secondary Music School), 2019).

But Latvia stands out among other countries – and can pride itself on the fact – that whatever rapid social economic changes have affected the country during the recent decades, it has been able to retain professionally-oriented musical education. There are 143 music and art schools in Latvia founded by municipalities and partly supported by the state. Foreign visitors and experts have repeatedly pointed out the phenomenon of music and art education in Latvia, not only the large number of children's music and art schools, but also musical education in schools (Matisāne, 2011). Its importance for the development of professional musicians and music teachers is undeniable, but its greatest contribution is the preservation and development of the values of Latvian cultural life, by raising educated music lovers – people that love music and are interested in it, attend concerts and consider music-making in amateur groups an integral part of their lives.

Therefore the main task for a teacher of collective music-making is to raise the students' motivation for participating in the field of music. Achieving this goal is getting increasingly harder in our times, as the changes in society also change the modern child's value orientation, the range of his/her needs and interests grows wider and more varied, changing the sphere of motivation along with it.

Government support for the professionally-oriented music education has currently decreased. Changes in society and students make demands on the teacher for not only a high level of professional competence and knowledge, but also one's own view of the world, individual stance and constant learning.

Collective music-making (playing an instrument or singing) is the activity offering the best opportunity for development of adolescents' skills. The adolescents joining groups form their personalities (Argyris, 1985; Garleja, 2003).

Studying collective music-making, as the means of developing an adolescent's personality as a whole, lead to the conclusion that this development will only take place if a number of factors interact together. Such development of adolescents' personalities as a whole is conditioned by the interest of the adolescents, their collaboration skills, socialisation, emotionality, self-analysis, self-realisation, cognitive abilities, their

understanding of music, artistic abilities and their skills of collective music-making, i.e. the skills of either singing or playing an instrument (see Figure).

Figure. Collective music making as an activity developing the adolescents' personality as a whole (authors' developed concept)

Collective music making – in the context of the reform of the Latvian education system

As the result of the reduction in funding (government grants for institutions of cultural education) in 2009 a reform of cultural education was initiated, applying adjustments to the content of professionally oriented education programmes (Latvijas Republikas Kultūras ministrija (Ministry of Culture of Latvia Republic), 2011) and in 2010 a 2 flow education programme model for musical schools was introduced, with a basic programme and an extended programme (Kultūrizglītības attīstība (Development of cultural education) 2009-2012, 2010) in which emphasis is placed on collective music-making and the proportion of theoretical and individual lessons is reduced. Along with that the children, adolescents and youth are encouraged to participate in different music groups– choirs, vocal groups, orchestras, creatively forming the music-making process of the group, thus resulting in the following benefits for the students:
- substantially promoted development of musical, intellectual and emotional abilities;
- significantly promoted acquisition of experience in collective and individual musical activity;
- developed creative abilities in music;

- developed ability to orientate oneself in musical genres and styles (Latvijas Nacionālais kultūras centrs (Latvian National Center for Culture), 2011).

The results of the survey of the leaders of Latvian collective music-making – the teachers

Studying the theoretical ideas in the field of music teaching and performing their analysis, within the framework of the present study the authors created a questionnaire, so as to get insight from the group leaders, regarding the development of their pupils' collective music-making experience, development of socialisation and collaboration skills, and the promotion of opportunities for self-realisation.

40 leaders of different music groups (choirs, orchestras, chamber ensembles and vocal groups) participated in this survey, of those 4 were leaders of orchestras, 9 were leaders of vocal groups, 11 were leaders of choirs and 16 – leaders of instrumental ensembles. Respondents were selected to represent almost all types of collective music groups in Latvia. The average experience of pedagogy work – 14 years (in the range of 1–40 years). Most of the participants (22 of those surveyed) lead collective music-making activities in professionally-oriented music schools – 11 in specialist education and 7 in general education schools.

The questions in the survey were mostly formulated in such a way that the respondents had the opportunity to respond in the affirmative or the negative, justifying their response.

The question: "Do you support the current emphasis in Latvian professionally-oriented education on collective music-making and the increase in the number of lessons? Please, respond with either "Yes" or "No" and provide the reasoning behind your response!" was answered with "Yes" by 37 respondents, while three responded in the negative, objecting to the same payment for both the individual and group lesson, also stressing the need for a reasonable balance between individual and collective music-making lessons in the curriculum.

The question "Is collective music-making the right form of activity for developing an adolescent's personality as a whole? Please, respond with either "Yes" or "No" and provide the reasoning behind your response!" received 35 affirmative responses, while two responded with "No", and three more provided no answer to the question. The respondents justified their responses by saying that socialisation and collaboration with other adolescents is fundamental to adolescents, therefore improved communication skills, a growth in discipline, and the promotion of general and musical skills are developed through collective music-making activities.

To the question "Which are the skills learned during collective music-making that promote the development of an adolescent's personality? (Please, name at least 3)" most of the participants responded by emphasising the following: listening skills (14), collaboration skills (12) and the development of responsibility (12).

The question "Do you believe that collective music-making activities promote the creative self-expression of adolescents? Please, respond with either "Yes" or "No" and provide the reasoning behind your response!" most of the teachers responded with "yes", while there were two responses of "No", one – "do not know" and one – "not in particular". This shows that the group leaders do believe that collective music-making activities contribute to the creative self-expression of adolescents.

The question "Which factors in the collective music-making process most help the development of adolescents' socialisation skills?" received interesting, but extremely varied responses. Many respondents emphasised the importance of collaboration for the achievement of common goals (11 respondents), but the positive atmosphere in the rehearsal process was also nominated as important (9 respondents).

And finally the question important in the context of the present study: "Are the socialisation skills necessary for playing in a group promoting the development of personality? Please, respond with either "Yes" or "No" and provide the reasoning behind your response!" nearly all respondents gave an affirmative answer, while only one was of the opinion that it cannot be judged that simply.

Therefore this leads to the conclusion that collective music-making promotes the development of socialisation skills, which are important in the development of personality. The conclusions from the empirical study regarding the formation of responsibility are also important, as are those about the development of listening and collaboration skills in the process of collective music-making. The development of personality in the process of collective music-making was indicated by the responses with statements such as: "…the adolescents' self-confidence grows, their communication improves, during the concerts they develop an increasing ability to control their emotions in the critical moments". "… the adolescents become more responsible, diligent, independent, and by collaborating they learn to accept differing opinions".

Conclusions

The survey resulted in the conclusion that it is particularly important to promote the formation of the students' collective musical experience through creative activity, by developing both instrument skills, and

socialisation and collaboration skills. A respondent who provided a very comprehensive answer did so in the context of the present study: "…these are skills that should be transferred to everyday life in the relationship with society – to listen, avoid conflicts, to provide support."

Collective music-making can be considered as a means of developing an adolescent's personality as a whole, if the adolescent has:

- developed elements of singing and instrument playing skills;
- a formed idea of the richness of musical culture;
- knowledge of the means of expression of the musical language, stylistic, genre-specific and other characteristics of a musical piece;
- developed general abilities – perception and intellectual abilities, emotional responsiveness to music, creativity;
- developed individual and collective music-making skills;
- strengthened their sense of national and patriotic belonging.

The carried out practical research proves the validity of the findings of well-known music scientists (Bonshor M., Lim M.C., Kumik E.) as well as the belief of the authors regarding the importance of the experience gained in the process of collective music making in the personality development of a teenager.

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TOWARDS A CONTEXT-SPECIFIC SCHOOL LEADERSHIP COMPETENCE FRAMEWORK: A CASE STUDY OF LATVIA

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ABSTRACT

The aim of the study described in this research paper is to examine effective school leadership practices by applying topical research knowledge in the area to the current school leadership situation in Latvia. The study design consists of two main stages – literature analysis, and the analysis of the Latvian context (analysis of 21 interview with school leaders, document and artefact analysis). As a result, authors have arrived at conclusions about the relevant context-specific aspects in regard to the effective school leadership in Latvia.

Keywords: educational/school leadership, school leadership's impact on student achievement, competence assessment and development.

Introduction

Latvia is undergoing a nation-wide curriculum reform in general education, with a focus on competency-based approach to learning and development of 21st century skills (Namsone, 2018). The reform implementation will start in September 2020 in preschools, and September 2021 – in schools. The success of the reform implementation falls also on the shoulders of the school leadership. Fullan (2015) sees school principals as "change leaders", and emphasizes their key role in school improvement and reform implementation. A large body of research on school effectiveness and improvement highlights the impact of school leadership

on student achievement (Leithwood, 2006, 2008; Hallinger, 2011; Waters, Marzano, McNulty, 2003). Evidence shows that school leadership is second only to classroom teaching in terms of the influence on student learning (Leithwood, Harris, Hopkins, 2008). In the context of the on-going educational reform, authors find it important to study the most significant school leadership practices that make a difference to student learning, with an aim to understand what "the right things to do" are to transition to the 21st century teaching and learning. Furthermore, the research focuses on the leadership practices that are significant and specific to the local context, understanding that "the precise characteristics of [..] effective leadership [..] are context dependent" (Reynolds, Sammons, De Fraine, Van Damme, Townsend, Teddlie, Stringfield, 2014).

Aim of the Study

The purpose of the research is to arrive at the local context specific framework of school leadership practices which are significant in the context of student achievement. This will be achieved by looking into differences between the leadership practice domains and dimensions described in the research literature and the practice of school leaders in Latvia. As a result, the school leadership framework that is usable in the Latvian context will be created and described. This research sets the ground for a further work on the development of a conceptual framework of school leadership competence assessment in the Latvian context.

To achieve the purpose, the following research questions are set:
1. What are significant school leadership practices described in literature, existing frameworks and normative documents?
2. How school leadership practices defined in research literature manifest in school practice in Latvia?

Theoretical Framework

To compare leadership practices described in the literature with practices of school leaders in Latvia, authors have chosen the Framework of Key Leader Practices by Hitt and Tucker (2015) as the main reference point. This decision was based on the fact that this is a unified framework, developed by conducting a systematic review of 56 empirical research studies in the period from 2000 to 2014, and covering over 40 years of research on principal effectiveness and its relationship with student achievement. In addition to the empirical research, it also integrates three other known frameworks.

The strength of Hitt and Tucker's framework lies also in the fact that it focuses on leadership practices rather than characteristics. That is important

for authors, considering the future goal to develop a working and local context specific school leadership competence assessment framework.

To ensure the comprehensiveness of the framework, authors additionally looked at the five other existing frameworks and guidelines describing impactful leadership practices: The Ontario Leadership Framework (developed by Kenneth Leithwood, 2012), The Australian Professional Standard for Principals and the Leadership Profiles (2015), The Wallace foundation Report (2013), The Framework of Reference by the European Qualification Network for Effective Leadership, (2011) and the OECD's Improving School Leadership – Policy and Practice in OECD Countries (2008, 2010). The summary of main domains or categories of various frameworks can be seen in the Table 1.

To have an overarching and all-encompassing view on the context of school leadership, as well as to gain greater understanding on the ways how school leadership influences student learning, authors used Hallinger's "Synthesized Model of Leadership for Learning" (2011), which is based on synthesis of 40 years of empirical leadership research. The added value of the model is that it organises various elements of "leadership for learning" in a system, thus explaining connections and hierarchies between them. The model emphasises that school and leadership sits in a certain context. Firstly, it is internal/school-level context, and secondly it is external context (community, country, society-level). It also indicates three core areas of leadership – setting vision and goals, development and implementation of academic structures and processes, and building people capacity. These all are well reflected in the frameworks described in the Table 1. Another important conclusion provided by the Hallinger's work is that the impact of school leadership on student learning is mostly indirect, i.e. through systems, procedures, people and the environment.

Methodology

This is a qualitative research, and it can be described by the following consecutive phases – review of the literature and building of an in-depth understanding of key areas of school leadership practice, school visits to interview school leadership and collect relevant materials and artefacts, interview and artefact analysis, additional document analysis, final development of the adapted framework of school leadership practices.

After the literature review, authors developed a set of interview questions, which matched the domains and dimensions of the chosen core framework by Hitt and Tucker (2015), and thus "the variables" of the interview were defined (Tuckman, 1972 in Cohen, Manion, Morrison, 2011). In total, 7 schools were visited and in each school three members of the leadership

Table 1. Overview of Various Frameworks Describing Impactful School Leadership Practices

Key Leader Practices to Influence Student Achievement, Hitt and Tucker, 2015.	The Ontario Leadership Framework, Leithwood, 2012.	Framework of Reference by the European Qualification Network for Effective Leadership, 2011.	The Wallace foundation Report, 2013.	Australian Professional Standard for Principals and the Leadership Profiles, 2015.	OECD, Improving School Leadership – Policy and Practice in OECD Countries, 2008, 2010.
5 practice domains: - Establishing and conveying the vision, - Facilitating a high-quality learning experience for students, - Building professional capacity, - Creating a supportive organization for learning, - Connecting with external partners.	5 core leadership capacities: - Setting goals, - Aligning resources with priorities, - Promoting collaborative learning cultures, - Using data, - Engaging in courageous conversations. 3 levels of practices: school-level leadership practices, system-level leadership practices and personal-level.	5 core domains: - Political and cultural expectations and their translation into internal meaning and direction, - Understanding and empowering teachers and other staff: - Culturing and structuring schools, - Working with partners and the external environment, - Personal development and growth.	5 key practices: - Shaping a vision of academic success for all students, - Creating a climate hospitable to education, - Cultivating leadership in others, - Improving instruction, - Managing people, data and processes to foster school improvement.	3 focuses: professional practices, leadership requirements, leadership emphasis. 5 professional practices: - Developing self and others, - Leading improvement, innovation and change, - Engaging and working with the community, - Leading teaching and learning, - Leading the management of the school.	4 areas: - Goal-setting, assessment and accountability, - Strategic resource management, - Leadership beyond the school borders, - Supporting, evaluating and developing teacher quality.

team were interviewed – the Head of the School and two Deputy Heads, thus in total 21 interview was conducted. The type of the interview was semi-structured. Although it had a set of pre-determined questions, when appropriate, interviewer allowed new themes to be brought up. Each interview was conducted by two researchers. One of them was leading the interview by asking the questions, and the other was making notes and following whether all relevant questions have been asked. Selected schools for the research were all general education schools of Valmiera city, which is the 8th biggest city in Latvia, and is the economic, educational, cultural and administrative centre of the Vidzeme region. Selected school sample represent a moderate diversity of schools in terms of their size, student achievement, programmes, etc. The number of schools and the context of a specific city could be one of the limitations of the research.

In addition to interviews, school teams participated in a mapping exercise organised by the research team – they were asked to mark and describe the practice dimensions of the Hitt and Tucker's framework in the context of their own practices. Also, researchers were observing the school environment, and were taking pictures of the learning and public spaces of the school to use them for later analysis.

The interviews were analysed by identifying "natural units of meaning", which later were classified and categorized in order to structure the outline of each interview (Cohen, Manion, Morrison, 2011). At the final stage, the overall conclusions and interpretations were made, specifically paying attention to the themes that were occurring most frequently, themes that weren't covered enough (i.e. practice dimensions that weren't explored enough during the interview, as well as during the mapping exercise), and themes that fell outside the defined "borders" of Hitt and Tucker's framework.

As a result, all analysis were pulled together, and authors reviewed the Hitt and Tucker's framework and in a group discussion agreed on the necessary adaptations to the Latvian context, considering the gathered data through the research.

Apart from interview analysis, authors looked at relevant normative documents regulating both school assessment and the new curriculum reform.

Results

The second column of Table 2 indicates the adaptations authors made, following the outcomes of the qualitative research. To show the changes and aspects that are specific for the local context in contrast to the original framework, the respective text is bolded and underlined.

Table 2. Two Frameworks: Hitt and Tucker's Framework (2015) and
The Adapted to the Latvian Context Version of the Hitt and Tucker's Framework

Hitt and Tucker's Framework of Key Leader Practices to Influence Student Achievement. Domains and Dimensions.	Hitt and Tucker's Framework of Key Leader Practices to Influence Student Achievement, adapted to the Latvian context. Domains and Dimensions.
1. Establishing and conveying the vision.	**1. Establishing and conveying the vision.**
• Creating, articulating and stewarding shared mission and vision.	• Creating, articulating and stewarding shared mission and vision.
• Implementing vision by setting goals and performance expectations.	• Implementing vision by setting **specific and learning-focused** goals and performance expectations, **performance measurement procedure and accountability.**
• Communicating broadly the state of the vision.	• Communicating broadly **and regularly** the state of the vision.
	• **Ensuring alignment between goals of the school, school leadership and each individual teacher.**
• Modelling aspirational and ethical practices.	• Modelling aspirational and ethical practices.
• Promoting use of data for continual improvement.	*Has been broadened and moved to the domain "Creating a supportive organization for learning".*
• Tending to external accountability.	• **External contexts, as well as school's local positioning and strengths are considered in building vision and goals.**
2. Facilitating a high-quality learning experience for students.	**2. Facilitating a high-quality learning experience for students.**
• Maintaining safety and orderliness.	• Maintaining safety and orderliness.
• Personalizing the environment to reflect students' background.	• **Creating** the environment to reflect students' background **and school as organization for learning.**
	• **Promoting wellbeing and inclusive education.**
• Developing and monitoring instructional program.	• Developing and monitoring **curriculum implementation.**
	• Developing and monitoring teaching and learning (instructional program) **that address needs and growth of every student.**
• Developing and monitoring assessment program.	• Developing and monitoring assessment program.
	• **Buffering staff from distractions.**

3. Building professional capacity.	**3. Building professional capacity.**
• Selecting for the right fit.	• Selection **and retention of high quality teaching staff.**
• Providing opportunities to learn for whole faculty, including leader(s).	• **Building effective system for learning needs assessment and** providing **appropriate continuous learning opportunities for all staff**, including leader(s).
• Providing individualized consideration.	• Providing individualized **approach to performance management and learning and development.**
• Creating communities of practice.	• **Embedding systems for exchanging knowledge and learning, and ensuring learning's transfer in practice.**
• Engendering responsibility for promoting learning.	• **Creating a culture of learning and development.**
• Supporting, buffering, and recognizing staff.	• **Demonstrating active position** in supporting and recognizing staff.
• Building trusting relationships.	• Building trusting **and cooperative** relationships.
4. Creating a supportive organization for learning.	**4. Creating a supportive organization for learning.**
• Maintaining ambitious and high expectations and standards.	• Maintaining ambitious and high expectations and standards.
• Acquiring and allocating resources strategically for mission and vision.	• Acquiring, allocating **and managing** resources strategically **in support of the school's vision and goals.**
• Considering context to maximize organizational functioning.	• Considering context to maximize organizational functioning.
• Building collaborative processes for decision making.	• Building collaborative processes for decision making **and distributing leadership.**
• Sharing and distributing leadership.	
• Tending to and building on diversity.	• Tending to and building on diversity.
• Strengthening and optimizing school culture.	• Strengthening and optimizing school culture **and values.**
	• **Leading innovation and change.**
	• **Promoting use of data and building systems for evidence-based decision making and effective data management.**
5. Connecting with external partners.	**5. Building relationships with local community and external partners.**
• Building productive relationships with families and external partners in the community.	• Building productive relationships with families and external partners in the community **(NGOs, companies etc.).**

• Engaging families and community in collaborative processes to strengthen student learning.	• **Engaging families and community in collaborative processes to support and strengthen student learning.**
• Anchoring schools in the community.	• **Anchoring schools in the community.**
	• **Partnership with local and national authorities and organizations/institutions significant for school improvement (municipality, ministry, agencies, etc.).**
	• **Networking with other schools and organisations for learning at national, international level.**

Discussion

The discussion is organised into sections according to the five domains of key leader practices identified in the systematic review by Hitt and Tucker (2015). Each section focuses on the aspects that are critical and relevant for the Latvian context. The suggested changes in the original framework and local context specific adaptations are described and discussed.

At the end of the chapter, the overall conclusions are drawn and further research ideas are presented.

Establishing and conveying the vision

Keeping in mind that the overall aim of the framework is to identify school leadership practices that are significant for school improvement and student achievement, it is crucial to underline the need for *goals of the school to be focused on learning.* Interviews indicate that goals that are set are not always clear and specific enough, as well as centred on student learning. Hallinger (2011) emphasises the essential role school leadership plays in directing and maintaining the focus of school's vision and goals on learning.

Considering that several research synthesis (Hallinger and Heck, 1996; Robinson et al., 2008) point out that vision and goals is the most important lever in hands of the leadership to influence student learning, authors add to the framework a new dimension *"Ensuring alignment between goals of the school, school leadership and each individual teacher"*, thus highlighting school leadership's role in building a coherent and hierarchical structure of goals within the organisation. Interviews provide an insight into importance of aligning the goals of school with those of leadership and each individual teacher. In several cases, members of leadership team gave different answers to the question about the goals of the school, their own goals and

goals for the teaching staff, illustrating that there are inconsistencies in internal goal alignment. The lack of clarity can negatively contribute to teacher motivation and commitment, and Leithwood and Jantzi (2006) emphasise that the motivation of school staff is particularly important for large-scale reforms to be successful.

Furthermore, interviews suggest the need for an active position of school leadership with regard to *setting performance expectations and building and overseeing performance measurement.* This goes in line with the need for school to have an adequate capacity in data-based decision making, planning and data management in general.

Interviews also show that school leaders are aware of external expectations and pressures, such as current curriculum reform and regulations defining changes regarding teaching and learning. They are also clear about their school's strengths and unique position in the local area. However, it can be concluded, that *not always this useful knowledge on external and local contexts inform vision and goals* that schools are setting and implementing. Authors see the need to strengthen this as one of the significant practices of school leadership in Latvia, and emphasise the need for school leaders to be the mediators between the external and internal contexts, able to "translate external requirements into internal meaning" (Framework of Reference by the European Qualification Network for Effective Leadership, 2011).

Facilitating a high-quality learning experience for students

Considering the significance of leadership practices related to high-quality learning experience for students, authors have suggested several adaptations.

Firstly, authors have added a dimension related to *curriculum implementation.* The on-going curriculum reform and respective changes in regulations foresee that schools have greater autonomy in the way they plan the delivery of curriculum, and the learning content is not organized in subjects, as previously, but in broader learning areas. Thus, there is a need for school level planning of subject teaching, taking into account school's specific situation, needs, and resources, for example, what subjects each teacher is teaching. The organization and monitoring of this process falls under the responsibility of school administration. In their research, Leithwood and Jantzi (2006) draw attention to the conclusion that school leadership has a significant influence on teacher classroom practices, and the possibility of these practices to be altered.

As regards assessment, the curriculum reform has an *emphasis on formative assessment and its effective implementation* (Čakāne, 2018). As most interviews indicate, primarily the assessment program is understood

in the context of summative assessment and results. There is a need for the development of systems and practices that promote effective use of formative assessment and diagnostic data, with an aim to better understand the necessary improvements in teaching and learning, and thus helping students' progress. In order to ensure successful reform implementation, it is highly important to set this as one of the key focus areas for school leadership.

Interviews with school leaders lead to an understanding that teachers have comparatively many obligations and are involved in various activities besides their teaching, for example, they are organising and participating in various events. The Ontario Leadership Framework under the domain "Improving the Instructional Program" has a dimension *"Buffering staff from distractions to their work"*. Considering the local context and interview results, authors have included this dimension in the adapted version of the framework, thus signalling the need for school leadership to enable teachers to have full focus on instruction, and address the role of leadership in buffering and protecting their staff from unnecessary bureaucratic and time-consuming activities that aren't directly linked to their job and the high-quality learning and teaching.

Taking into account the OECD's PISA 2015 results, illustrating challenges for Latvian schools with regard to students' exposure to bullying and students' sense of belonging at school, by perception of teacher support, authors have added to this domain of the framework a context-relevant dimension concerning school leadership's practices to *promotion of wellbeing and inclusive education.* Furthermore, interviews indicate that there is a crucial need for strengthening the dimension of inclusive education and supporting learning and development of every child. In their answers about school's success, several school leaders celebrate the achievement of few top-performers instead of continuous growth of every student. Also, the lack of knowledge and experience, as well as resources to deliver differentiated instruction and assessment is mentioned as one of the areas for improvement. Research proves, however, that schools can improve student learning outcomes despite the various starting points, and that leadership through modelling central organizational processes plays a critical role in this regard (Hallinger, 2011).

Field notes from school visits, photos taken at schools, as well as interviews suggest that some schools are using their physical environment more effectively than others to communicate that school has a specific audience – young people and a specific goal – their learning. For example, some schools have an informal space for learning outside the classroom, as well as space for resting and free time activities. The equipment and furniture is suitable and comfortable for the students. Also, authors

paid attention to how schools use their space outside the classrooms to communicate students' learning, i.e. how they are using walls, corridors, entrance area and any other public space school has. As a result, the respective dimension is paraphrased as *"Creating the environment to reflect students' background and school as organization for learning".* It can be suggested that this contributes to students' sense of belonging and thus their general wellbeing at the school.

Building professional capacity

Interviews suggest that there is a lack of procedures on how learning needs are assessed and what the role of the leadership is in this regard. Overall, teachers are actively involved in various learning activities and trainings, however, in most of the cases their learning is dependent on the supply, i.e. what training is being offered, and it isn't necessarily needs-driven approach. Following school leadership reflections on the comparatively low effectiveness of learning, authors have paraphrased the dimension, by emphasising that *learning of the staff should be based on their actual and specific needs.* This helps to design appropriate learning solutions for the professional capacity building of the staff.

It is important to provide tailor-made and individualised professional development solutions, tackling the exact areas for improvement. Furthermore, authors see that *learning should be linked to the individual performance goals of the staff, the necessary competence development, as well as monitoring of the progress.* This is confirmed also by the Australian Professional Standard for Principals (2015). Although some of the interviewed school leaders mentioned the practice of yearly performance assessment through school administration's conversation with each individual teacher, there is a need for a more systemic and strategic development of performance management and planning of individual learning and development.

Authors have *broadened the formulation of the domain "Creating communities of practice".* In the Latvian context the "communities of practice" mostly manifest in so called methodological committees that are organized either around subjects or learning areas. Interview results show, however, that they are predominantly communities of information transfer and focus on effective information flow that is characteristic to hierarchical management structures. Considering that the curriculum reform focuses on "school as a learning organisation" (OECD, 2016), with highly collaborative, learning orientated culture and student learning and achievement as it's primarily goal, there is a need for building systems and effective ways how staff learning and best practice exchange can add value and transform their performance. Also, authors want to stress the importance of knowledge transfer into practice. As a result, the context-relevant dimension *"Embedding*

systems for exchanging knowledge and learning, and ensuring learning's transfer in practice" has been developed. In their research on teacher effectiveness, Muijs, Kyriakides, Werf, Creemers, Timperley, Earl (2014) highlight the need for the "shifts in thinking", and outline the need for "collaborative inquiry based on the principles of self-regulated learning" instead of simple information exchange.

Creating a supportive organization for learning

As regards leadership practices related to creating a supportive organization for learning, apart from several rather minor additions and changes, authors have added two new dimensions to the original framework – "Leading innovation and change" and "Promoting use of data and building systems for evidence-based decision making and effective data management". *Leading innovations and change* is mentioned in the Australian Professional Standard for Principals, 2015, and authors find this as a relevant leadership practice, considering the ongoing curriculum reform. Most of the interviews indicate leadership's awareness of the necessity to manage change, however only few are taking an active leadership position in this regard.

Such leadership practices as *data usage in monitoring instruction and assessment and data-driven decision making and planning,* are crucial for the Latvian context and relevant for a successful implementation of the reform. Interviews indicate that leaders aren't actively using data in their work, and many of them are at the beginning level of the data competency, i.e. either making decisions that aren't based on data or aren't able to make an effective use of and apply the available data (Cech, Spaulding, Cazier, 2018). Also, the Australian Professional Standard for Principals (2015) highlights the need for school leadership to "use a range of data management methods and technologies to ensure that the school's resources and staff are efficiently organised and managed to provide an effective and safe learning environment as well as value for money".

Building relationships with local community and external partners

The original leadership framework domain "Connecting with external partners" has been broadened as well, and authors have included two significant partnership areas – *partnership with the local and national authorities*, and *partnership with other schools.* This goes in line with the Framework of Reference by the European Qualification Network for Effective Leadership (2011), and the results of the interviews. In their answers, school leaders emphasised the significance of the support from the local authority (methodological and professional development support, resource-related support, strategic guidelines, funding, social

support programmes for certain groups of students, etc.). Also, various perceptions on relationship and power distribution between schools and the municipality were observed; some leaders believed they have an impact on the decisions taken at the municipality level and saw the municipality as their partner; at the same time some leaders believed that the municipality has the power over their development and they have little or no impact on the decisions that are taken at the municipality level. Thus, the school-municipality relationship is a specific and relevant aspect to consider in the Latvian context.

In addition to the interview analysis, the analysis of documents was conducted. There are two main conclusions stemming from the review of the documents. Firstly, the documents regulating the new curriculum and its implementation in general education are in line with the leadership practices described in the framework and the adaptations that were made support the reform implementation. Also, the educational reform utilizes the OECD's concept "school as a learning organization", that aligns and covers almost all domains of the framework.

As regards the normative documents for school and leadership assessment, it can be concluded that key school leadership competences identified in the document overlap with the competences of the framework; however, they lack the detail and angle specific for the implementation of the reform goals. Furthermore, the assessment is conducted once every 6 years, and its primary aim is to assess staff's suitability for the position. As regards the method of assessment, school leaders are assessed through an electronic performance assessment system that is based on their self-assessment, and thus the objectivity of the assessment can be questioned. The framework that authors aim to develop has an emphasis on learning and development of the leadership, and provision with clear instructions, examples and ways how they could improve their practices, in order to improve student achievement. Also, authors see the need for development of assessment methods of school leadership practices.

Conclusion and Further Work

Overall, it can be concluded that conducted interviews and study of relevant materials and artefacts, have provided authors an insight that the existing frameworks, describing leadership practices that influence student achievement, should be adapted to the local realities. Furthermore, the need for adaptations applies to all domains and levels of leadership practices. At the same time, the Hitt and Tucker's framework served as a valid backbone structure to test and analyse educational contexts specific to Latvian schools.

The key local specifics refer to the school leadership's responsibility and action towards clear and learning-focused vision and goals; data-driven performance assessment and management systems; specific programs for learning, teaching and assessment with an aim to improve every student's achievement; individualized learning and professional development systems; relationship building with student families, community and relevant external partners.

Considering the current curriculum reform and the role leadership plays in influencing student achievement, this research provides a useful road map for schools to become more effective. Further research can focus on detailed description of each dimension by identification of indicators that characterise the lowest and the highest value of the dimension, i.e. two extreme values. Additionally, examples illustrating those values at various levels (the lowest, the highest) can be gathered from the local schools. As a result, the further steps would lead to the development of locally relevant School Leadership Competence Assessment Framework, helping schools to improve and manage their development.

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THE PROFESSIONAL LEARNING COMMUNITY AS AN ORGANIZATIONAL SYSTEM FOR SCHOOL STAFF DEVELOPMENT, SCHOOL CHANGE AND IMPROVEMENT

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ABSTRACT

In the context of the general education content reform initiated in Latvia, which also provides change of learning approach, involvement in mutual professional learning activities at school has raised the issue of teachers` professional growth. In the scientific literature the concept of the professional learning communities (PLC) is considered to be an effective organizational system for school staff development, school change and improvement on the basis of two considerations. First of all it is presumed that teachers` professional knowledge is a part of their everyday experience and that this knowledge is best understood in a critical exchange of ideas with other teachers, who have the same experience. Secondly it is assumed that teachers who are actively involved in the PLCs will be able to increase their professional knowledge and competence, thus contributing to students` learning and their learning outcomes. The main goal of the research is to find out whether and to what extent teachers in the Latvian general education institutions take part in the PLCs. The article discusses theories of the concept of PLC and analyses the results of 489 teacher surveys. The results of empirical research do not show significant differences in the mean values of the PLC scales in primary and secondary schools. The data shows a very significant difference in the average values of the PLC scales in schools of the same level of education.

Keywords: general education, professional collaboration of teachers, professional learning communities, school leadership.

Introduction

Student learning outcomes depend to a large extent on the motivation and performance of each individual teacher in the classroom. Traditional teaching at school is practiced as the "solo art" of each individual teacher. The teaching autonomy of a teacher in many places is still considered to be

untouchable, and the intervention is sharply at odds with existing practices (Pont et al., 2008). However the concept of the professional learning community (PLC) in school management and the studies over the last two decades give new perspectives on the professional development of teachers.

Teaching in the classroom is based on the practical knowledge of teachers (Van Driel et al., 2001). The practical knowledge of teachers is formed by working at their school, combining experimental knowledge, formal knowledge and personal beliefs. Consequently many teachers` beliefs and practical knowledge of teaching are limited to their personal experience by working at school (Namsone et al., 2016).

Traditional professional development models, on the other hand, aim to provide teachers with knowledge and skills needed to become "better" educators. These models are usually based on the presumption that the purpose of the professional development is to present teachers with "knowledge for practice", i.e., that the formal professional development activities are based on the assumption that knowledge and competence are best developed by university researchers outside the day-to-day pedagogical work and that by participating in formal processional development activity teachers acquire and apply this knowledge in their professional work in the classroom. In addition, the knowledge provided is generally recommended as a "recipe for better teaching" (Vescio et al., 2008).

In order to effectively improve the professional development of teachers, since the 90`s of the XX century the emphasis of teacher professional development has gradually shifted from formal improvement of qualification in teacher professional development programmes to teacher cooperation in the PLCs, where teachers learn from each other within their schools (OECD, 2016). The researchers even suggest that the term "professional development" should be replaced with the term "professional learning" (Timperley et al., 2007; Easton, 2008; Stoll et al., 2012; Kools, & Stoll, 2016; Schleicher, 2016). Professional learning between teachers enables them to share experience and deepen their knowledge of theoretical guidelines, methods and processes for teaching and learning, and to gain approval for their professional practices on the basis of the analysis of student achievements and other evidence of successful change. Despite these reasonable arguments, international research has shown that there still are a large proportion of teachers who have not participated in such professional development forms as mutual learning, joint teaching or involvement in joint professional development activities (OECD, 2014). This situation could be explained by the fact that teachers traditionally practice teaching as solo art individually and interference in the teaching autonomy of teachers is in contradiction with the existing practice (Pont et al., 2008).

To change this situation, teachers should engage in a mutual exchange of experience at the PLCs in their school, analysing and reflecting realistic pedagogical challenges that would allow teachers to learn different kinds of experience, participate in discussions, exchange views, analyse and reflect on the teaching of their and their colleagues (Namsone et al., 2016). This is particularly relevant in the context of the general education content reform launched in Latvia, which also provides for a change in the teaching approach. The introduction of the new learning content and teaching approach needs to strengthen and develop cooperation between teachers at school level in the planning and implementation of the teaching and educational process, in order to harmonise content issues and improve curricula to regularly analyse student learning achievements and find the best solutions for raising the educational outcomes of each student, so that teachers can improve teaching and share good pedagogical practices with each other.

The main aim of the research is to find out whether and to what extent teachers in the Latvian general education institutions take part in the PLCs.

A theoretical analysis of the scientific literature was done within the research. Teacher survey made by the authors has been used as a measuring instrument for carrying out an empirical research. The study analysed the survey data of 489 teachers.

Professional Learning Community

Studies carried out in the recent decades have been based on an organisational approach to promoting the professional growth of teachers focusing on the development of the PLC at school (see, e.g., Louis et al., 1996; Hord, 1997; Bolam et al., 2005; Timperley et al., 2007; Vieluf et al., 2012; OECD, 2016; Schleicher, 2016).

According to the definition provided by the OECD researchers, the PLC is an inclusive and mutually supportive group of teachers with a collaborative, reflective and growth-oriented approach to study and learn more about their professional practice, with the main purpose to improve the learning of all students (Kools & Stoll, 2016). The PLC is composed of joint purpose and task-driven professionals, who are constantly gaining new knowledge through interacting with each other and trying to improve their pedagogical practices (Hord, 1997; Louis et al., 1996).

The importance of the concept of the PLC in the context of school in the scientific literature is based on two considerations:
- first of all, it is presumed that the professional knowledge of teachers is part of their day-to-day experience and that this knowledge is best understood in a critical exchange of ideas with other teachers, who have the same experience;

- secondly, it is assumed that teachers who are actively involved in the PLCs will be able to increase their professional knowledge and competence, thus contributing to students` learning and their learning outcomes (Vescio et al., 2008; OECD, 2016). The empirical studies also show a positive link between the development of the PLCs in schools and their student achievements (Stoll et al., 2006; Lomos et al., 2011).

The concept of the PLC includes three important elements (Bolam et al., 2005; Stoll & Louis, 2007; Hord & Hirsch, 2008; Verbiest, 2011):

- the professionalism of teachers, based on their knowledge and shared responsibility;
- the mutual learning of teachers within the school, through critical evaluation and self-reflection, with the main purpose to improve their professionalism;
- the community as an indicator of the quality of the relationship between teachers, which makes mutual learning and growth possible.

The main focus of the concept of the PLC is the focus on the learning of each student; therefore, the involvement of teachers in the cooperation and their activities under the concept of the PLC is fundamentally different from the traditional approach of the activities of teachers, who are not active in the PLC at school (InPraxis Group Inc., 2006; Sigurdardóttir, 2010). These differences are described in Table 1.

Table 1. Differences between traditional approach and the approach of the PLC (InPraxis Group Inc., 2006)

In the traditional approach teachers …	In the approach of the PLCs, teachers …
• focus primarily on teaching	• focus primarily on each student`s learning
• are isolated from one another, the opportunities to cooperate on strategies to improve student learning are limited	• work in cooperation with other teachers; feel collectively responsible for the learning and growth of all school teachers and students
• teach according to a set of externally fixed curricular standards that remain constant; decide by themselves what to teach	• see students` learning as an ongoing process; jointly adjust the curriculum to the learning needs of the students
• are given little or no time to work in cooperation with colleagues	• have structured time to observe and reflect on each other work and serve as critical friends in support of each other
• teach students according to their individual understanding of teaching styles and techniques	• build an understanding of each other's style and technique so they can learn from one another and complement each other work

The concept of the PLC shifts from the traditional "teacher-oriented" approach to "student-centred" approach, where teachers work together and cooperate by focusing on a joint mission and building capacity, identify gaps in teaching and learning and develop effective pedagogical practices to ensure the needs of all students (Darling-Hammond, 1996).

Focus on professional learning communities in the school setting has resulted in a redefining of the teacher`s role. The teacher is no longer a passive instructor, who simply transfers knowledge to the student, but an active agent of change, who leads the learning of a student (Cowan, 2003). When involving in the PLC teachers become empowered as they tackle initiatives and take risks, accept leadership responsibilities, and feel confident as professionals (Slater, 2008).

Researchers point out that teacher cooperation itself does not mean full functioning of the PLC. It is essential whether teacher cooperation in the PLC focuses on everyday work in the classroom with the main purpose to improve the learning of every student. The effectiveness of the PLC and the increase of the capacity of each teacher in the PLC depend on a large extent of collective self-analysis and feedback, the reduction of teacher isolation, the reflection of current teaching practices and shared responsibility for all students` learning. Thus, the student success is the only institutional priority of school as an organisation and its attention is shifted from the excuses and finding perpetrators to an approach focusing on the student individual needs (Du Four et al., 2006).

Studies (Hord, 1997; Vescio et al., 2008; Lomos et al., 2011) show positive effects of the PLC on both teachers and students. In the case of teachers, the PLC reduces teacher isolation; reinforces the commitment to the school mission and to the achievement of school objectives; increases collective responsibility for learning outcomes; stimulates deeper insight into their daily practices and critical analysis; activates mutual learning, builds better teaching practices and creates new knowledge and understanding of teaching and learning; reinforces awareness of students and their individual needs and the role of the teacher to help all students to achieve performance-relevant results; enables teachers to make a significant progress in adapting teaching to students` individual needs more quickly than traditional schools; ensuring teacher awareness; promoting professional renewal of teachers and the capacity to inspire and motivate students; promotes job satisfaction; stimulates commitment to make significant and lasting progress and change (Hord, 1997). The positive effects of the PLC teachers on students are evidenced by a decrease in the number of early school leavers and second-year students; a reduction in delays; higher school outcomes than in traditional schools; lower gaps in learning achievements among students at different capacity levels (Hord, 1997).

In view of the complexity of the PLC, this study is based on the model developed by the Canadian scientists on the PLC as a multilevel multi-dimensional concept (Mitchell & Sackney, 2011; Sleegers et al., 2013). That model reflects the PLC at three levels - the individual level of the PLC members, interpersonal level of the PLC members and the level of cooperation between the PLC members and school as an organisation. In each of these levels, a number of interrelated groups of characteristics or dimensions to describe the PLC are identified. The involvement in the PLC at individual level is characterised by active and reflective development of new professional knowledge of the member and the use of the good practice acquired by the participation in the PLC. The development of the PLC at interpersonal level is characterised by the dimensions of joint understanding of teachers on school mission, objectives, mutual cooperation between teachers, sharing professional knowledge and personal practices acquired at individual level, sharing responsibility for students` learning. Schools as the organizational level include the provision of such supportive resources necessary for the operation of the PLC as available time, information and materials, reflection of the support of school management for the professional cooperation of teachers, as well as the joint commitment of teachers to promote the success of each student in training.

In this research the authors focus on three interpersonal and two organizational levels that describe the formation of the organizational level PLC as variable scales, which content is described in Table 2.

Methodology

Teacher survey created by the authors of the research on the functioning of the PLC at school has been used as a measuring instrument for carrying out an empirical reserach.

The 40 statements were selected from surveys of British (Bolam et al., 2005) and Belgian (Vanblaere & Devos, 2016) scientists based on the content of the PLC within this research.

The statements of the survey are grouped in five dimension scales of the PLC.

The Likert scale was used in the survey. The internal consistency of the survey variable scales has been verified by Cronbach alpha-factor. An overview of the number of teacher survey statements and Cronbach`s alpha-factor is given in Table 2 on each of the scales.

The teacher survey was conducted in school year 2017/2018 in 25 schools of the municipalities in the western part of Latvia. A total of 580 paper surveys were distributed, of which 489 or 84.3% were returned. Of the total, 306 teachers (63% of respondents) were surveyed in

11 secondary schools and 183 teachers (37% of respondents) in 14 primary schools.

Table 2. The Scales of the PLC

Scales	Number of items	Cronbach α	Content of the dimensions of the PLC
Interpersonal level			
Shared sense of purpose and values	6	.80	Reflects the degree of the agreement between teachers on school mission, common objectives and operational principles
Collective focus on students` learning	10	.71	Describes a shared commitment of teachers to improve student learning in a long term
Sharing personal practice	7	.70	Reflects discussions on teaching methods, exchange of the ideas and problem-solving advices between teachers based on the classroom observations by colleagues
Organizational level			
Collective responsibility for students' learning	10	.83	Describes the commitment of teachers to promote the intellectual growth and development of each student and to achieve the success of students in learning
Supporting conditions	7	.68	Describes the support of the administration to teacher professional cooperation and growth

Of the total number of respondents, 445 (91%) were women, while 44 (9%) were men. The average age of the teachers involved in the study was 47.9 years (between 21 and 74 years). The gender profile of the sample respondents is in line with the conclusions of the OECD TALIS 2018 study on the gender ratio of Latvian teachers (89% female and 11% male) (OECD, 2019). On average, the teachers involved in the study were slightly younger compared to the results of OECD TALIS 2018, which shows that 51% of Latvian teachers are older than 50 years (OECD, 2019).

The average duration of the total pedagogical length of service of the teachers involved in the study was 24.3 years (between 1 and 51 years).

The smallest number of teachers participating in the survey in one of the schools was eight teachers, and the largest was 44 teachers. An average number of teachers surveyed in one school – 19.6. On average, 23.5 teachers were surveyed in one secondary school and 15 teachers in primary schools.

All the schools involved in the research were general education primary or secondary schools funded by municipalities. The research did not

involve gymnasiums, private schools, boarding schools, special schools or vocational orientation schools. In all schools in which the study was carried out, the training took place in Latvian.

Results

The survey data was processed using the SPSS program. The descriptive statistical methods (frequencies, weights) were used for the analysis of data to give an overall picture of the schools involved in the survey, the teachers surveyed and their answers.

The descriptive statistics compiled in Table 3 do not show any significant difference in the mean values of the PLC scales in primary and secondary schools. Only in the PLC scale "Sharing personal practice", secondary school teachers demonstrate more frequent involvement in the discussions of teaching methods and in exchange of the ideas and problem-solving advices among teachers than primary school teachers.

Table 3. Mean values and standard deviation (δ) of the PLC scales for primary and secondary schools

Scales*	Primary school teachers (N = 183)			Secondary school teachers (N = 306)		
	(δ)	x_{min}	x_{max}	(δ)	x_{min}	x_{max}
Shared sense of purpose and values	10.06 (1.79)	5.97	13.08	9.96 (2.12)	3.84	13.08
Collective focus on students` learning	10.08 (1.93)	5.30	14.24	9.95 (2.04)	3.18	14.24
Sharing personal practice	9.67 (2.25)	4.38	23.13	10.19 (1.81)	4.70	15.19
Collective responsibility for students' learning	10.13 (2.13)	4.84	15.69	9.92 (1.92)	3.97	15.69
Supporting conditions	10.04 (1.72)	4.53	14.80	9.97 (2.15)	3.96	16.51

N (teachers) = 489 and N (schools) = 25
* Scales are recalibrated with an average of 10 and standard deviation 2

Table 4 summarises the mean values of the PLC scales for each school involved in the research. The data presented in Table 4 shows a very significant difference in the average values of the PLC scales in schools of the same level of education. For example, secondary schools "K" and "L" have significantly lower average values on several PLC scales. It is possible that the differences identified in the study between the PLC scales in schools of the same level of education can be explained by the fact that school principals do not have sufficient understanding of the importance of the PLC in promoting the professional development of teachers and that it

is not self-evident for teachers to cooperate with each other in their schools and that it is not easy to break traditional views of teachers as firmly autonomous professionals.

Table 4. Mean values of the PLC scales in participating schools

School type	School	Mean values* and standard deviation (δ) of the PLC scales				
		Shared sense of purpose and values	Collective focus on students` learning	Sharing personal practice	Collective responsibility for students' learning	Supporting conditions
Secondary school	A	9.59 (2.10)	9.99 (2.14)	10.79 (1.80)	10.23 (2.25)	10.67 (1.60)
	B	9.76 (1.75)	9.82 (1.83)	10.33 (1.30)	9.87 (1.92)	9.76 (2.24)
	C	9.79 (1.89)	9.61 (2.23)	10.78 (1.39)	9.96 (1.23)	9.53 (1.68)
	D	10.28 (1.76)	9.57 (2.29)	10.66 (1.79)	10.27 (1.93)	10.19 (1.77)
	E	11.68 (1.07)	11.39 (1.45)	10.84 (1.40)	9.86 (2.02)	11.97 (1.30)
	F	11.12 (1.85)	10.50 (2.21)	9.36 (1.68)	9.45 (2.07)	10.76 (1.99)
	G	10.64 (1.20)	10.35 (1.48)	9.29 (1.79)	8.88 (1.70)	9.22 (1.92)
	H	9.48 (2.48)	9.45 (2.03)	10.90 (1.83)	10.27 (1.72)	10.06 (1.95)
	I	11.17 (1.24)	10.33 (1.84)	10.40 (1.66)	10.35 (1.94)	10.39 (1.80)
	J	9.67 (2.05)	9.89 (2.25)	9.40 (1.56)	9.77 (1.28)	9.87 (1.96)
	K	7.88 (1.91)	8.64 (1.02)	10.14 (2.33)	10.04 (2.34)	7.02 (2.04)
	L	7.06 (2.31)	8.74 (2.37)	8.91 (2.44)	9.91 (1.87)	7.81 (2.27)
	M	9.52 (2.63)	10.05 (2.06)	9.16 (1.64)	10.32 (1.89)	10.08 (2.04)
Primary school	N	10.47 (1.90)	10.21 (1.94)	9.61 (1.92)	10.12 (2.10)	10.31 (1.79)
	O	10.11 (1.85)	10.26 (1.83)	9.99 (2.02)	9.72 (2.18)	9.99 (1.52)
	P	9.61 (2.24)	9.71 (2.56)	8.93 (2.13)	9.84 (2.39)	9.71 (2.19)
	R	9.98 (1.77)	10.03 (1.98)	10.22 (1.81)	10.28 (2.04)	9.33 (1.55)
	S	10.83 (1.21)	11.93 (1.76)	12.12 (3.97)	11.06 (2.05)	10.95 (1.82)
	T	10.94 (1.27)	9.09 (1.12)	7.21 (1.71)	8.40 (2.15)	9.36 (0.97)
	U	10.56 (1.00)	10.35 (1.73)	9.98 (1.32)	11.29 (1.31)	11.38 (0.81)
	V	11.06 (1.54)	11.05 (1.66)	9.65 (1.84)	11.28 (1.27)	10.33 (1.21)
	W	9.29 (1.23)	10.34 (1.58)	10.21 (2.59)	10.59 (2.31)	9.54 (1.82)
	X	8.69 (1.78)	9.16 (2.07)	8.49 (1.89)	9.20 (2.39)	9.19 (1.91)
	Y	9.32 (0.95)	8.80 (1.10)	10.06 (1.45)	9.19 (1.65)	10.00 (1.55)
	Z	9.15 (2.09)	9.66 (0.78)	10.06 (1.21)	11.26 (1.19)	10.31 (1.81)

N (teachers) = 489 and N (schools) = 25
* Scales are recalibrated with an average of 10 and standard deviation 2

Conclusions

The results of an empirical research do not show significant differences in the mean values of the PLC scales in primary and secondary schools.

The very significant difference in the average values of the PLC scales in schools of the same level of education is explained based on two considerations. First of all, not all principals of the schools involved in the research understood the importance of teacher-mutual cooperation and learning for PLC. Secondly, it is not self-evident for teachers to cooperate in their school and to break the idea of teachers as firmly autonomous professionals in their classroom.

The results of the study are likely to reaffirm the conclusion that it is not easy for teachers to deviate from traditional professional autonomy and actively engage in professional cooperation and learning activities at their school, to hear and accept professional advice and constructive criticism from colleagues, thereby revolutionising their professional learning and skill habits. The regulatory framework in force in Latvia regarding the requirements for the professional development of teachers is also not aimed at promoting the involvement of teachers in professional cooperation and learning activities in their school and promoting the development of the PLC. Article 15 of the regulations of the Cabinet of Ministers of Latvia regarding the education and professional qualifications required for an educator and the procedures for the development of the professional competence of educators (2018) states that the educator of general, vocational and interest education shall develop his or her professional competence by studying the programme for the improvement of the professional competence of educators within a period of three years at the least amount of 36 hours. On the other hand, Article 19 of the same regulations states that in the development of the professional competence of an educator outside direct pedagogical tasks (participation in conferences, seminars, masterclasses, traineeship industry undertakings, participation in training organised by employers' organisations to promote the competitiveness of the educator, personal development) takes up topics within three years to a maximum of 12 hours. Consequently, it can be concluded that the requirements in force in Latvia for the professional development of teachers are mainly intended to implement the professional development of educators only in formal professional development programmes outside the day-to-day pedagogical work of the school, but within the meaning of the regulatory framework regarding the professional development of the teacher, the involvement of teachers in professional cooperation and learning activities in the school is not considered.

It should be noted that in countries which education systems in the OECD PISA studies are characterised by high student learning outcomes, such as Singapore and Japan, the majority of teachers` professional development activities are carried out in their workplace –schools, where teachers and principals are jointly searching for optimal solutions for their schools to meet specific educational objectives and to solve pedagogical problems (Timperley et al., 2007; Vieluf et al., 2012; Kool & Stoll, 2016; Scleicher, 2016).

It is therefore important that Latvian state education policymakers and educational quality monitoring institutions also officially recognize teacher professional development implemented by the PLC through the involvement of teachers in professional cooperation and learning activities at their school.

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THE ASPECTS OF IMPROVING TEACHER'S PROFESSIONAL ACTIVITY ORIENTED TOWARDS THE LEARNER'S WELLBEING AND SUCCESS

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ABSTRACT

Education today is going through an important period which is marked by changes, therefore, it is essential to consider the needs of the changing society. It calls for a new attitude towards modelling of the educational process that focuses on the learner's wellbeing and personal success, i.e., the emphasis is laid on its efficiency, which enables the learner to pursue good learning outcomes. Targeting at the goals of general education during the music lesson, the teacher considers the peculiarities of the learners' developmental period, individual specifics of their attention, perception, thinking and emotional development as well as their inclinations and interests. The teacher also searches for the appropriate educational methods or their combinations. Therefore, on the basis of the conducted research, attempts are made to highlight and create strategies that can contribute to revealing socio-educational factors that can result in successful learning and wellbeing of a learner. The research problem is formulated as the question: what factors can have influence on improvement of music teacher's pedagogical activity while focusing on the learner's wellbeing and his/her success in the process of education? **The goal of the research:** to reveal possibilities for improving music teachers' pedagogical activity that focuses on the learner's wellbeing and success in a school of general education. The research revealed that achievements in innovative educational research direct the teacher towards successful participation in the processes of music education development and dissemination.

Keywords: music education, music teacher, learner.

Introduction

Education of pupils in schools is one of the areas where the main goals of the education reform are being implemented, i.e., the emphasis is laid on enabling the learners to comprehensively develop their physical, mental and spiritual qualities, to unfold their personality that would cherish meaningful values (The National Education Strategy for the Period of 2013–2022,

2014). The Order of the Minister of Education and Science of the Republic of Lithuania No. V–683 On the Approval of the Description of Teacher Education Model (2017) targets at reforming the system of teacher training and qualification by training teachers who constantly develop professionally and work efficiently, teachers as members of the system of education who are motivated, flexible, not afraid of challenges and innovation. Different roles of the teacher are emphasized – a researcher; a person able to get to know the learner and cherish his/her powers; in the context of global changes, a creator of educational interaction and innovative content; a learner's advisor and consultant; a provider of pedagogical help in case of inclusive education; etc. In this context, educational documents respond to the needs of personal, societal and state development to foster an independent person for the future – flexible, open, responsible, creating, able to solve problems and adapt to the changing conditions of the environment (Education and training in Europe, 2020; Descriptor of Professional Competences of a Teacher, 2007; On the Approval of the Description of Requirements for Teacher Qualification, 2014). All the important factors mentioned above predetermine the attractiveness and prestige of the pedagogical profession, moreover, they precondition teaching/learning outcomes.

Transforming educational research has been undergoing social, technological and cultural changes, which call for a new attitude towards modelling of the educational process that focuses on the learner's wellbeing and personal success. The pedagogical interaction between the learner and the teacher and a two-way dialogue are perceived as a condition for engaging the learner into successful educational activity, encouraging him or her to discover, learn and create. Communication between the teacher and the learner play a significant role, where the interaction takes place and information is exchanged. Music education in such a context is a rather specific discipline encompassing the theoretical content together with a wide range of musical practice, during which not only musical abilities but also aesthetic, emotional components a well as those of feelings and intelligence are developed. Therefore, the success of the teacher relies on a versatile meaningful musical activity, whose relevance has been investigated by numerous music educologists from different countries: Heimonen, Herbert (2019), Sepp, et al (2019), Davidova, et al (2017), Hedden (2017), Hofer (2017), Sakadolskienė (2017), Vitkauskas, et al. (2012), Girdzijauskas (2012) and others. *The research problem* is formulated as the question: what factors can have influence on improvement of music teacher's pedagogical activity while focusing on the learner's wellbeing and his/her success in the process of education? **The goal of the research:** to reveal possibilities for improving music teachers' pedagogical activity that focuses on the learner's wellbeing and success in a school of general education.

Music Teachers in the Context of Changing Education Paradigms

The role of the music teacher is not limited to passing on knowledge in the music lesson, the teacher is the one who fosters the learners' wider interests, search for information not only within the scope of the school but also outside it. Music content changes due to the changes in social and cultural life, increase of media influence and changing values. The learners openly accept modern information, which does not always form a favourable, aesthetic perception of music. Therefore, challenges of the changing society provoke music teachers to orient in a changing environment, to search for diverse methods that ensure increased interest of the learner as well as develop his/her personality. According to Rinkevičius (2002), in order to successfully develop learners' abilities of musical thinking and musical culture, it is essential that the teacher should not only consider himself/herself to be a disseminator of information, but also a creator of a personality.

According to Johnson and Mattheuws (2017), the teacher's pedagogical activity can be divided into three stages: planning, instructing and reflecting. Reflective teacher's thinking is of key importance in the proper choice of flexible teaching methods that meet the learners' needs. In their research conducted, Powell and Parker (2017) refer to an image of a successful teacher possessing qualities such as taking care of pupils, being honest, having a good sense of humour, being able to manage time and energy, feeling self-confident, being joyful, humble, patient and consistent in his/her professional activity. Besides, a successful music teacher does not distinguish between professional and everyday life. Lasauskienė (2010) claims that the teacher's ability to work in diverse teaching/learning environments, dissemination of new ideas, appreciation of a learner's knowledge and achievements, search for innovative teaching methods are constituents of the teacher's main mission. Therefore, the teacher performs various functions in the educational process, such as diagnosing, planning, assessing, organizing, etc.

The teacher develops own artistic and pedagogical powers while developing himself or herself, thus, he/she is capable of optimizing the educational process and as a result, simultaneously develops own personality (Vitkauskas, 2001). Moreover, Strakšienė (2004) states that the type of the music teacher makes influence on cooperation in the music lesson, as it has been noticed that the personality type of a music teacher can predetermine the success of the learners. Abramauskienė and Kirliauskienė (2014) claim that the music teacher is supposed to not only be good at the subject field but also have comprehensive erudition of musical culture, since the subject of music encompasses a wide range of

musical experiences (from psychomotor skills to aesthetic relationship with music). Therefore, it is important to develop a deeper and more meaningful learner's relationship with music. The content of music education should encourage the learner to discover, show interest, think creatively, perceive and interpret, since the learner's wellbeing and success of music education depend on that.

Methods

The national survey "Pedagogical activity of the contemporary music teacher in a Lithuanian general education school: state and possibilities for improving" was conducted in Lithuania in 2016-2018 with the aim to identify and evaluate the peculiarities of the music teacher's professional activity, to foresee strategies for the improvement of the professional development of music teachers as well as those for the training of music teachers with the focus on the wellbeing and success of the learner. The information was obtained from teachers, school heads, learners and parents, whereas this article presents the results of an online survey of music teachers. The research sample embraced 306 music teachers from general education schools in Lithuania; they teach at institutions of primary, basic (lower secondary) and upper secondary education. Scientific recommendations how to target the research at the wellbeing of the subject that were provided by Bitinas (2006), Žydžiūnaitė and Sabaliauskas (2017) were referred to while conducting the research. The data obtained were carefully examined; they are authentic, probable, valid and reliable.

The methods of the research: *Data collection:* integrative analysis of scientific literature and educational documents; written questionaire survey of music teachers. *Data analysis:* statistical analysis of research data using a statistical data processing software; qualitative content analysis.

The questionnaire survey method was used to conduct the reseach, where the compiled questionnaire employed in the research process encompassed questions related to *planning and organization of the music lesson; teaching and learning; help to the learner; assessment; relationships, procedure and class management; and learning environment.* The questionnaire consisted of 70 statements that can be answered by choosing one of the provided options: agree, partially agree, disagree. It also included questions aiming to characterize the respondent's age, education, working experience, qualification category, size of the school, type and location of the educational institution.

Results and discussion

The analysis of the characteristics of the survey respondents revealed that the majority of them are music teachers aged between 41–50 years old. Data analysis also disclosed that their working experience ranges mainly from 15 to 25 years, that music teachers have a university degree and the distribution of the qualification category between a senior teacher and a teacher methodologist is almost the same. Since the quantitative research was conducted by carrying out a questionnaire survey in Lithuania, the information related to the location (city, town, village) of the respondents was also included. The majority of the teachers who participated in the survey work in the city. The research targeted at music teachers of primary, basic (lower secondary) and upper secondary schools of general education but the analysis of the results shows that the majority of the respondents work in gymnasiums. Although the participants of the survey teach in general education institutions of a different size, the majority of them work in schools with the number of learners ranging from 200 to 500.

The online survey of the research conducted aimed to ascertain music teachers' pedagogical activity in general education schools, problems that emerge, possibilities for improving, therefore, the teachers were inquired about organization and planning of music lessons. (Table 1).

Table 1. Planning and organizing a music lesson: insights into how to improve the teacher's pedagogical activity (in per cent)

Statements	Agree	Partially agree	Disagree
I rely on educational documents that regulate music education	74.5	23.9	1.0
I feel responsible for the outcomes of my pedagogical activity	98.0	1.3	0
Teaching/learning objectives, educational content, methods and teaching aids are compatible in my lesson	76.8	21.9	1.0
The teaching methods I apply correspond to the age, experience, capacities and needs of the learners	84.6	14.4	0.7
I formulate objectives of the lesson exactly and clearly so that the learners can understand them	81	18.3	0.7
I plan music lessons including elements of "unexpectedness and creativity"	58.2	40.8	1.0
I plan the content of music lessons taking into consideration the learners' progress, musical skills and needs of a particular group	80.7	19	0.3
I plan integrated assignments and activities together with teachers of other subjects	41.5	49.7	8.5

The analysis of the research data reveals that music teachers feel responsible for the outcomes of their pedagogical activity (98.0 per cent of the respondents indicated the option of "agree") and rely on educational documents that regulate music education (74.5 per cent correspondingly). The research disclosed that teachers plan the content of music lessons taking into consideration the skills of a particular class of learners (80.7 per cent) and apply teaching methods that correspond to the age and experience of their learners (84.6 per cent). It is noticeable that nearly a half of the teachers who participated in the survey (49.7 per cent of the respondents indicated the option of "partially agree") less often integrate music lessons with other subjects or plan integrated assignments in their own lessons. Only 58.2 per cent of the respondents plan music lessons including elements of "unexpectedness and creativity". However, no matter how active the teacher may be, if the learners are even occasionally prevented from taking over the initiative, it is hardly possible to expect interesting and independent solutions made by learners themselves as well as performance-oriented success of the pupil (Girdzijauskienė, 2008; Šečkuvienė, 2004). Creative activity is primarily related to the learners' ability to independently perceive the problem and look for the ways to solve it.

The research also aimed at disclosing aspects of improving teaching (Table 2).

Table 2. Teaching: insights into how to improve the teacher's professional activity (in per cent)

Statements	Agree	Partially agree	Disagree
I integrate music with other subjects	60.1	37.9	1.6
I relate musical activities with everyday experience and interests of the learners	65.7	32.4	1.6
I apply teaching/learning methods that aim at consolidating learning	75.8	22.5	0.3
I employ feedback methods so that to reflect pupils' learning	67.3	30.4	1.3
I foresee which learner or group of learners may need help while doing the tasks and prepare for this in advance	52.0	44.8	2.3
When the learners work either individually or perform tasks in pairs or groups, they are well aware of the rules and process of such forms of work	68.3	30.4	1.0
I select information relevant to music education from various sources of information	84	15	0.7
Learners in my lessons assume the role of the teacher (e.g., they become partners, consultants, advisers, mediators, planners, experts)	34	60.1	5.2

Statements	Agree	Partially agree	Disagree
I assign homework tasks to deepen and consolidate the material acquired during the lesson	30.7	44.8	21.9
I consistently teach according to the textbook in my lessons	9.2	53.6	36.6
The learners use workbooks	19.9	34.3	44.8

As indicated in Table 2, music teachers apply teaching/learning methods that aim at consolidating learning (75.8 per cent of the respondents) and reflect at the end of the lesson (67.3 per cent). The respondents point out that they collect information from various sources while preparing for lessons (84 per cent). However, 44.8 per cent of the participants in the survey state that their pupils do not use workbooks. More than 50 per cent of the teachers teach according to the textbook inconsistently, only 30.7 per cent of the respondents claim that they assign homework tasks to consolidate the material acquired during the lesson. The results of the study suggest that teachers take into consideration the needs and experience of the learners. However, the teacher is supposed to be a facilitator, a counsellor who provides the pupils with information and tools, a person who assists in foreseeing possible ways of problem solution, a one who plans and organizes a successful performance of the learners (Hallam, 2010). Therefore, it is possible to claim that the teachers are in constant pursue of new materials, they strive to employ a diversity of teaching methods, they evaluate the content and asses the outcomes of their work, i.e., they try model the educational process with focus on the learner's wellbeing and personal success.

Aspects of organization of the learning process, the results of which are provided in Table 3, were also analysed in the research.

Table 3. Learning: insights into how to improve the teacher's pedagogical activity (in per cent)

Statements	Agree	Partially agree	Disagree
I encourage learners to ask questions and get fully involved in the activities in the classroom	84.3	15	0.3
I formulate tasks that promote problem-based learning and learning through experience	49.3	45.1	4.2
My lesson opens up possibilities for creative self-expression	62.4	35.9	0.3
The pupils learn how to cooperate with each other during my lessons	71.2	27.8	0

The analysis of the results shows that the respondents encourage their learners to get fully involved in the classroom activities, to engage in a dialogue, music teachers create possibilities for the learners to develop their self-expression through creative activities. 71.2 per cent of the survey participants claim that their pupils learn how to cooperate with each other during the lesson. On the other hand, only 49.3 per cent of the respondents formulate tasks that promote problem-based learning and learning through experience. Based on the data collected in the survey it is possible to claim that the development of pupils' critical thinking and communication skills in the music lesson remains a relevant issue (General programmes of primary and basic (lower secondary) education, 2009).

Moreover, the respondents were asked to evaluate the statements related to the area of help for the learner, therefore, Table No. 4 presents insights into the improvement of the aspect in question.

Table 4. Help for the learner: insights into how to improve the teacher's pedagogical activity (in per cent)

Statements	Agree	Partially agree	Disagree
I assign tasks of different complexity taking into consideration different musical skills and capacities of the learners	53.3	44.4	1.6
I provide feedback to the learners related to their individual achievements	74.2	24.5	0.7
I prepare additional tasks for the more gifted learners, I foresee ways for individual self-dependent learning together with a pupil	47.7	46.1	5.2
My remarks are directed towards the work done by the learner, not to the person	87.6	11.1	1
I provide the learners with an opportunity to self-correct their mistakes	80.1	19.0	0.3
I develop self-esteem and self-confidence of the learners	87.6	11.4	0.7
I combine the aims, objectives and teaching methods with the individual needs of the learners	53.6	43.8	2.0
I plan additional work for the learners with special educational needs	49.3	42.5	7.2
The learners have a possibility to develop their own musical skills when taking part in various projects, concerts and festivals	88.9	10.1	0.7
More gifted or more experienced learners provide help for those who need it	76.8	20.9	1.6

According to the survey results (Table 4), nearly 89 per cent of the respondents affirm that their learners develop own musical skills in the music lesson and participate in various educational activities of music.

Less than a half of the survey participants prepare additional tasks for the more gifted learners, promote self-dependent learning, plan additional work for the learners with special educational needs. On the other hand, a significant number of the respondents (76.8 per cent) claim that they create conditions for the learners with more experience in music to help their classmates, thus, the cooperation among the pupils is developed.

The research data analysis also showed that music teachers seek to develop their pupils' self-confidence and self-esteem, encourage them to notice the mistakes made and analyse them in the music lesson. It is worth highlighting that the respondents state that they evaluate their pupils for the work done, not as a person (87.6 per cent). Approximately 75 per cent of the survey participants provide feedback to the learners related to their individual achievements during the lesson, i.e., successful learning and wellbeing of the learner are given considerable attention.

Nevertheless, the analysis of the study data preconditions the need to encourage schools to apply innovative teaching methods, to develop communication skills, skills of cooperation and self-dependent learning, to promote the use of information and communication technologies in the process of music education.

In the survey the respondents were also inquired about the assessment of the learners' achievements, the data obtained are analysed in Table 5.

Table 5. Assessment: insights into how to improve the teacher's pedagogical activity (in per cent)

Statements	Agree	Partially agree	Disagree
The assessment criteria are well known and understandable for the learners	84	13.4	1.3
I often praise and encourage the learners for their good performance	95.8	4.2	0
I apply unanimous assessment criteria for the learners' progress and musical achievements	77.1	20.3	1.3
I compile a plan of tasks for assessment for a learning cycle	34.3	56.2	8.5
I regularly evaluate musical achievements of the learners by recording their progress	61.1	35.9	2.6
The evaluation is commented and justified	77.8	20.3	1.6
I encourage the learners to self-evaluate and reflect on their own achievements	67	30.7	1.6
I encourage the learners to evaluate others according to the criteria	43.5	47.1	8.8
I discuss instances of success and failures with my colleagues	44.8	49.7	5.6

The results in Table 5 illustrate that about 96 per cent of the respondents encourage the learners for their good performance, 67 per cent encourage the pupils to self-evaluate and reflect on their own achievements. 77 per cent of the survey participants apply unanimous assessment criteria for the learners' progress and musical achievements, they give comments and justify their evaluation. 84 per cent of music teachers claim that the assessment criteria are well known and understandable for their learners. However, about 56 per cent of the respondents do not compile a plan of tasks for assessment for a learning cycle. Meanwhile, nearly a half of the survey participants indicated the option of "partially agree" dealing with the statement about discussing instances of success and failures with their colleagues. Therefore, it can be assumed that the assessment process in the music lesson aims at motivating the learners and providing possibilities for experiencing success. However, the pupil shall not be afraid to ask, make a mistake, have a different opinion form the majority. The most important prerequisite for one's better learning outcomes is the pupil's psychological security, therefore, it is essential to create a favourable climate in the classroom (Foran, 2009; Hunter, et al, 2010; Salienė, 2016).

It is well known that assessment aims at helping the learner to study successfully, develop oneself and get mature. Assessment enables the teacher to accumulate and use information about the pupil's learning experience, achievements, progress made, to foresee a learning perspective and make reasonable solutions.

Furthermore, findings of the research related to relationships, procedure and class management are discussed in Table 6.

Table 6. Relationships, procedure, class management: insights into how to improve the teacher's pedagogical activity (in per cent)

Statements	Agree	Partially agree	Disagree
I sometimes make rules for the behaviour in the classroom together with the learners	70.3	25.8	3.3
In case of interference, I respond to the situation immediately	87.9	10.5	0.3
I deal with the learners who have behavioural problems individually	42.5	47.4	8.8
I manage to build a friendly relationship between my pupils and me in the classroom	78.4	20.6	0
If the learners fail to understand something during the lesson, they address me for help	88.2	9.8	1.3
I give negative evaluation	26.5	44.4	28.1
I give only positive evaluation	20.6	42.2	35

Statements	Agree	Partially agree	Disagree
I keep reminding the learners which kind of behaviour is acceptable in the classroom	65.4	30.1	3.6
I raise my voice	11.8	63.4	23.5
I try not to pay attention to problems that sometimes emerge	7.8	46.1	45.1
I ask those who make a noise to leave the classroom	5.2	17.3	75.5
I am punctual, I avoid "time killing", I do not waste time on unnecessary things, I prepare the materials, musical instruments, etc. in advance	76.5	21.9	0.7
There appear no problems of discipline and behaviour in my lessons	29.7	56.9	12.7

The analysis of the research data revealed that music teachers respond to interference in the music lesson and try to deal with such a situation (87.9 per cent). In case the learners find the lesson material or an assignment difficult to understand, they address the teacher for help during the lesson (88.2 per cent), which reveals that the relationships between the pupils and the teacher are positive (78.4 per cent). 76.5 per cent of the respondents claim that they do not waste time in the music lesson, they prepare the materials in advance, besides, 70.3 per cent state that they make rules for the behaviour in the classroom together with the learners.

The study disclosed that music teachers give approximately the same amount of positive (42.2 per cent) and negative (44.4 per cent) evaluation to their pupils. 47.4 per cent of the respondents marked the option of "partially agree" when dealing with the statement about how they address the learners who have behavioural problems. About 76 per cent of the teachers do not ask those pupils who make a noise to leave the classroom when trying to manage problematic situations during the lesson. It can be noted that about 60 per cent of the respondents claim that there appear no problems of discipline and behaviour in their lessons. Taking into consideration the results in Table 6, it is possible to notice that the relationships, procedure, class management in the music lesson are directed towards successful and safe education and oriented towards the child's wellbeing. It is obvious that in order to make the educational process attractive and joyful it is important to select proper teaching methods, tools and topics that would enhance the learner's interest in the educational process, one's motivation to study, one's responsibility, it is essential that conditions and situations allowing the learner to experience the success of learning and performance are created.

The information provided in Table 7 illustrates the survey results that characterise learning environment in the music lesson.

Table 7. Learning environment: insights into how to improve the teacher's pedagogical activity (in per cent)

Statements	Agree	Partially agree	Disagree
The atmosphere in the classroom is characterized by the lack of tension and fear	79.7	14.1	5.6
The predominant communication between my pupils and me is characterized by mutual respect	75.8	23.2	0.3
There is no urgency in the lesson, I am patient when responding to some pupils' slow pace of learning	63.1	35.6	0.7
I show understanding when reacting to mistakes of the learners	89.9	9.5	0.3
I have enough music textbooks in the music room	44.4	36.3	18
There are numerous teaching/learning tools received through EU projects in the music room	24.2	31	43.5
I also use my own visual tools in the lesson	65.4	30.7	2.3
I use a variety of tools to deliver the material (computer, multimedia) during the lesson	76.8	15.7	6.2
I use a Smart Board in the lesson	6.5	10.8	80.7
I use a variety of music computer programmes in the lesson (*Sibelius, Magix Music maker, The Ejay, Groovy Music, Auralia*).	14.4	37.6	46.4
I use non-traditional teaching/learning environments (going to concerts, on educational excursions)	35.3	50.3	13.4
In the music lesson we most often perform the following activities: *Sing,*	78.4	20.6	0.3
Play various musical instruments,	46.7	45.4	5.2
Rhythm,	67	31.4	0.7
Solfeggio,	39.5	45.4	12.7
Create music,	25.2	56.5	16.3
Improvise,	38.2	59.9	6.9
Participate in discussions to analyse and evaluate the musical pieces we listened to,	66	29.1	3.3
Participate in some extra musical activities at school,	70.3	26.1	2
Participate in musical events in the city.	55.6	35.9	6.2
Working conditions at school are good (music room, safe environment, suitable working hours, good infrastructure, etc.)	53.9	36.6	8.2
The school allocates sufficient funds to equip the music room with teaching/learning tools	33	45.4	19.9
We can move freely, rearrange the desks, sit in a circle, etc. in the music room	49	31.7	17.3

Favourable learning environment and mutual collaboration enable the learner to find intrinsic motivation to study and master the information received during the lesson. The survey participants emphasize that they show understanding when reacting to mistakes of the learners (89.9 per cent), moreover, a mutual respect is predominant in the communication between the teacher and pupils (75.8 per cent). Furthermore, the atmosphere in the music lesson is characterized by the lack of tension and fear (79.7 per cent). The majority of the respondents (76.8 per cent) indicate that they employ various teaching tools in the music lesson. Nevertheless, it is worth mentioning that more than 80 per cent of the teachers do not use Smart Board in the classroom, 46.4 per cent do not make use of a variety of music computer programmes and 43.5 per cent of the respondents claim that teaching/learning tools are not sufficient in the music room (received through EU projects). Thus, it can be assumed that the insufficient use of modern technology makes the music lesson less attractive for a contemporary learner.

The research also aimed at investigating the activities that prevail in the music classroom. The analysis of the survey results disclosed that singing (78.4 per cent), rhythm (67 per cent) and participation in discussions to analyse and evaluate the musical pieces the pupils listened to (66 per cent) are the predominant ones. Besides, the teachers also encourage their pupils to participate in extra curriculum activities at school (70.3 per cent). Less attention is given to solfeggio (the option of "partially agree" was marked by 45.4 per cent of the respondents). The survey participants affirm that working conditions at their school are favourable (53.9 per cent), whereas only 33 per cent of them agree that their school allocates sufficient funds to equip the music room with teaching/learning tools. The teachers agree (49 per cent) that it is possible to organize various activities in their classroom since they can move freely and rearrange the desks. The research confirms that the learning environment should be creative, since it fosters the learners' innovative thinking and flexibility, it preconditions the ability to envisage and notice problems, to think and experiment. When experiencing the joy of creativity, a positive approach to novelty is developed as well as imagination, sensitivity, openness to oneself and others, moreover, the learners are encouraged to participate in a variety of activities so that they could satisfy their needs for self-expression.

Conclusions

The research revealed that achievements in innovative educational research direct the teacher towards successful participation in the processes of music education development and dissemination. The research data

allow to conclude that the activity of the teacher today is based on the following: the content of the lesson is planned considering the abilities, developmental peculiarities of a specific class and applying appropriate educational methods; information for the lesson is collected from various information sources; critical thinking, communication skills and creativity are promoted in the lesson taking into account the learners' interests and needs; evaluation of school learners' achievements encourage them to learn and reflect, assessment criteria are understood and accessible to everyone according to abilities, etc.

Having considered the opinion of the teachers in the survey, the following aspects of the teachers' activity that focus on the success and wellbeing of learners can be highlighted: efficiency of school students' learning is improved by integration of new technologies, video and audio equipment in a lesson; continuous search for ways of curriculum improvement; efficient application of teaching aids in a lesson; differentiation of assignments and possibility for its choice; attention to interdisciplinary integration; inclusive education; variety of material resources; needs for teachers' professional development, etc.

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SHIFTING THE FOCUS OF PROFESSIONAL DEVELOPMENT: FROM INDIVIDUAL TEACHERS' COMPETENCES TO A SYSTEM OF CONTEXTUAL PROFESSIONAL ACTIVITY

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ABSTRACT

The aim of the proposed article is to compare two conceptually different views on teacher professional development: the traditional competence approach and the model of system of contextual professional activity as proposed by the researchers of cultural-historical activity theory. The competence model is aimed primarily at the all-round development of an individual, while the activity system model analyses the actual occurring professional activity in its systemic context. While the competence model helps identify the areas of professional development for an individual teacher, the activity system model lets systemic contradictions in the working practice be identified, analysed and addressed by modelling solutions. In addition, the competencies of individual teachers of an activity system (comprising the teaching-learning process in a particular school) may be considered interconnected and complementary.

It is concluded that the competence approach is more suitable for teacher training and the identification of the required competence spectrum to implement a certain type of curriculum, whilst activity systems approach is suitable for planning and implementing professional development as an effort to redesign work collaboratively on a school level, focusing on the improvement of work practices according to the identified issues, constraints, contradictions and collaboration opportunities.

Keywords: Professional development of teachers, Activity systems approach, Competence approach.

Introduction

Teacher quality and teaching quality have been stated as key assets for the quality building of an education system (European Commission, 2013; Guerriero, 2017). Therefore, teacher professional development, commonly understood as the improvement of the professional competencies of in-service teachers via participation in dedicated activities, is inevitably a focal point in a comprehensive education policy. If initial teacher

education providers may regard their client to some extent as a blank page (professional identity still to be formed), in the case of organizing professional development of in-service teachers it is crucial to account for the systemic historical developments that shape the common sphere of comprehension. Experience is constructed contextually and so is learning (Goba, 2019). In a country like Latvia with a population of schoolteachers characterised by a high average age and a small proportion of young teachers (Ministry of Education and Science of the Republic of Latvia, 2019), the challenges faced by most teachers during their professional career should be taken into account – such as reorganization of the education system after the collapse of the USSR, democratization, liberalization, significant decrease in teachers' authority in society, changes in the general perception of what pedagogical approaches are to be considered optimal, uncertainty associated to major changes in society (Andersone, 2015; Kokare, 2011; Zaļaiskalne, 2013).

A new challenge to the schoolteachers of Latvia is the anticipated reform, Skola 2030, that aims at fundamentally shifting the teaching practices (Oliņa et al., 2018; Skola 2030, 2017). It also sets forth a challenge to reduce teaching-by-example and drilling, shifting the emphasis to fostering critical thinking and deep learning; enhancing skills in curriculum development as well as abandoning the former exemplar curriculums. This reform could set the cornerstone for systemic changes and invigorate learning, but it could also become another trial for the educators to endure before they revert to former practices.

Professional development activities are typically aimed at the competence building of teachers; in Latvia these activities commonly consist of further education courses, education conferences and seminars, as well as observation visits to other schools and organizations (Organisation for Economic Co-operation and Development [OECD], 2019a). The activities are targeted at individual teachers rather than teacher-teams and are mostly disconnected from classroom practices and the specific teaching context. The existent regulatory framework promotes participation in activities that result in a certificate attesting the number of hours devoted to development; ensuring that participation in professional development activities results in positive contributions to the teaching practices is the collaborative responsibility of teachers and school leaders (Kozlovska, 2015).

However, institutionally provided activities have a limited power to influence the practice as there are no universal incentives for teachers to apply the mastered skills and competences in practice, and the evaluation of the impact of certain professional development activities is considered complicated and costly (McChesney & Aldridge, 2019). Despite the best efforts of policy makers to re-shape the teaching practices, large educational

reforms are seen to have limited influence over practices and cultures in schools (Labaree, 2012). There are systemic constraints that need to be addressed in order to implement an innovative learning culture as a school-wide phenomenon in contrast to confined efforts of enterprising individuals. The approach of systems analysis arises as an attempt to overcome these constraints via identifying, analysing and mitigating them (Barab et al., 2002; Engeström, 2001; Yamagata-Lynch & Haudenschild, 2009).

The aim of the proposed article is to compare two conceptually different views on teacher professional development: the dominating professional competence approach (European Commission, 2013; Pellegrino, 2017) and the systems model of contextual professional activity as proposed by the researchers of cultural-historical activity theory (Engeström, 1987; Engeström & Sannino, 2010).

Competence approach: typically focusing on an individual

The historical model of workplace training in business and industry was shaped by the assumption that issues in employees work are caused primarily by deficits of knowledge or skills, therefore targeted programmes are delivered that would alleviate this deficit (Cranton, 1996). Through the years complex competence models have been developed in order to map all the contents of specific competences in detail for optimal performance. Typically arranged through sets of knowledge, skills and dispositions or attitudes (European Commission, 2013), these models help set goals for vocational education curriculums and professional higher education programmes. They are also used to set professional standards and to determine appropriate candidates for certain positions. However, the downside of these elaborate competence models emerges when it comes to their application outside the context of formal education, and professional development of in-service teachers in particular. In fact, the accompanying life-long learning ideology has been criticized for its narrow, utilitarian and instrumental view of learning, prioritizing the needs of the market and diminishing the value of curiosity, emancipation and moral dimension that has been a strong aspect of adult education tradition (Thompson, 2007). The issue with the ponderous competency models has been addressed with new frameworks that emphasize the transversal aspects – such as the 21st century competences (Voogt & Roblin, 2012), key competences (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2007, 2019), transversal attitudes, skills and knowledge for democracy (Mompoint-Gaillard & Lázár, 2015).

When it comes to the identification of professional development needs and goals of in-service teachers, how helpful are these competence

frameworks? If the learning needs are identified as deficits in specific instrumental knowledge and skills, narrowly targeted training should solve the problem. However, large-scale international studies show that collaborative and school-based approaches are among the most impactful types of professional development (OECD, 2019b). The thematic working group on teacher professional development set up by the European Commission points out that due to the complexity and range of competencies required for contemporary teaching, an individual teacher may not be expected to have them all developed to the same high degree, or even developed at all. Therefore, the focus of competence development necessarily shifts towards a teacher team, a school or an entire education system, so that the competence set is embodied collaboratively (European Commission, 2013).

A large body of research shows that the teacher collective efficacy and the beliefs teachers hold about teaching and learning significantly influence student learning (Donohoo, Hattie, & Eells, 2018; Hattie & Zierer, 2018). Thus, teacher professional development should be regarded as a process of not only acquiring the lacking knowledge and skills, but also of revising beliefs about education that shape one's dispositions. What we do is shaped by our beliefs, these beliefs are shaped by our experiences and our experiences are inevitably constructed within our life-worlds, shaping our sphere of comprehension (Goba, 2019). Therefore, professional development of in-service teachers necessarily calls for a systemic view.

Activity systems approach: professional development and learning as a school-wide phenomenon

A greater collaboration and collective learning for the development of teaching profession was encouraged by the OECD publication as early as 2011 as an approach that enhances the professional activity of teaching (OECD, 2011). It is stated that collaborative learning and change efforts need to be supported (OECD, 2016). Teaching is an activity that is explicitly social, intersubjective and contextual. Therefore, it calls for a systemic view of professional activity considering its context, interrelations and contradictory aspects.

The activity systems model developed by Yrjö Engeström offers such a systemic view on professional activity development (Engeström, 1987). Rooted in cultural-historical activity theory (CHAT) (Engeström, 2009), it takes activity system as its initial unit of analysis comprising of the mediated action between subject (teacher(s) engaged in the activity) and object of activity (the horizon of opportunities at which the activity is directed, the carrier of motive of activity), this mediation is realized through cultural

tools (physical objects as well as concepts, models, signs, languages etc.) and turned into actual outcomes. The described system becomes contextual and descriptive of organizational realities through integrating the systemic elements of community (in which the activity is situated), division of labour (allocation of tasks as well as power and status) and rules that guide and constrain the actions within the system (norms, standards, regulations as well as implicit norms and habitual expectations). Any activity system may be seen as involved in network relations to other activity systems (Engeström & Sannino, 2010); thus, several interconnected activity systems become the focus of analysis.

If applied to professional development of teachers, this model helps identify contradictions in work practice that may be connected to systemic flaws in work arrangements that alternatively might misleadingly be described as deficiencies in a certain type of competence (Yamagata-Lynch & Haudenschild, 2009), thereby combining both bottom-up and top-down perspectives. For example, if training is targeted at conflict resolution and communication skills in a situation where conflicts are resulting from ambiguous allocation of tasks and conflicting rules guiding the working practice, the problem might be toned down but not solved. Of course, professional development targeted at individual teachers is less complicated and consumes less resources than analysing and redesigning a whole professional activity within a teacher team or a school. As researchers have noted, there are systemic constraints to collaborative self-organizing learning in schools that systemically inhibit expansive learning – teaching professionals typically work as isolated practitioners in autonomous classrooms; they work in standardised time sequences at schools that function as encapsulated units, while the measured outcome of the activity is expressed in grades (Engeström, Engeström, & Suntio, 2002). Tensions and contradictions are inevitably encountered when attempting collaborative learning and activity analysis. According to CHAT, contradictions are the driving force of change, therefore the manifestations of contradictions, tensions, ruptures in the flow of activity and double binds are met as learning opportunities (Engeström & Sannino, 2010).

The activity systems model may be used by coordinators of professional development as an analytic tool to identify systemic contradictions in the working practice and to delineate developmental needs. But it also serves as a conceptual tool for CHAT-based formative interventions that aim at collaboratively developing working practices in a targeted and orderly manner, while developing novel solutions rather than implementing a standardized pre-set scenario developed by an outside expert. The Change laboratory, a method developed by researchers of Helsinki University, serves both for developing working practices (and that necessarily involves

learning on the part of the involved parties), researching the involved collaborative learning processes and developing the underlying theory of expansive learning (Virkkunen & Newnham, 2013). Research shows that various aspects influence the progress of the intervention and that, while not guaranteed due to the open-ended nature of the process, the potential gains from the intervention involve: (a) a deeper understanding about the multi-voicedness of the activity gained through analysis; (b) analysis of core concepts involved in the activity provide grounds for negotiation and a better understanding among participants; (c) agency gained by the participants seen as their ability and readiness to engage in reshaping the activity system in question; (d) the reshaped activity system that better serves the needs of those involved (Engeström & Sannino, 2010; Virkkunen & Newnham, 2013).

The activity systems approach clearly does not prioritize an all-round development of individuals; neither does it provide an ideal state descriptor. Rather, it is a tool for realistically inquiring into the complex components of social reality. The activity systems approach is an opportunity to create solutions that are not yet there (Engeström & Sannino, 2010) and to analyse the actual occurring professional activity in its systemic and historical context. From a systemic view, the competencies of individual teachers of an activity system (comprising the teaching-learning process at a particular school) may be considered interconnected and complementary.

Conclusion and discussion

Two conceptually different views on teacher professional development were analysed in this article: the competence approach and the activity systems approach. Both have extensive research traditions as well as practical applications; however, the systems approach is notably less common in professional development practice among schoolteachers. In Latvia, clearly the dominant approach is directed towards the competence development of individual teachers, disregarding the benefits of other collaborative and school-based forms of professional development (Kozlovska, 2015, OECD, 2019a). However, voices gain power in both European (European Commission, 2013) and global arena (Donohoo et al., 2018; Guerriero, 2017; OECD, 2011, 2019b) that advocate for more consideration of school-based realities, learning-collaboration benefits and, consequently, for more systemic approaches to the professional development of teachers. As noted previously, certain systemic constraints distinguish the working practice of teachers that confine collaborative learning and development efforts. Therefore, the systemic dimension of teacher professional development requires special attention.

The dominating competence approach is more directed at an all-round development of individual teachers and serves as an ideal state descriptor. However, it must be kept in mind that the majority of teachers have not developed all the competencies equally well. The competence approach leads the way for teacher preparation, curriculum design and the identification of learning needs of an individual teacher, but it lacks the descriptive power to tackle systemic problems encountered in the working practice of schools.

The activity systems approach, by contrast, is suitable for planning and implementing professional development as an effort to redesign work collaboratively on a school level (and beyond), focusing on the improvement of work practices according to the identified issues, constraints, contradictions and collaboration opportunities. The activity systems model focuses on the actual occurring professional activity in its systemic context, characterised by the involved actors and other elements of the system. Its strength is the developmental path towards innovating and developing a working practice where a unified and easily transferable solution does not exist.

It may be concluded that both approaches analysed are not fundamentally contradictory: they are two facets of the same reality, each setting the focus differently. A systemic view towards the working practice is necessary to facilitate the transformation of practices and to encourage expansive learning, while the focus on individual dimension allows to account for individual learning needs of teachers and identify teacher beliefs and dispositions that might hinder growth. Being aware of the two discussed approaches capacitates teacher educators and stakeholders to distinguish the means for achieving systemic changes in teaching practices within schools, considering that not all lies within the reach of an individual teacher; collaborative and school-based strategies should be considered.

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PILOTING A TEACHER COMPETENCE MANAGEMENT MODEL IN SCHOOLS

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ABSTRACT

Compulsory education curriculum reform will introduce teaching 21st century skills bringing in significant changes to how teacher work happens in Latvia. This highlights the role of school teams to plan not only whole-school development but also teacher personalized professional development to implement necessary changes. This research presents a school-based comparative case study for piloting a teacher competence management model that is created by the authors. The model represents the interaction of goal setting and competence management in organizations and this research paper is emphasizing parts of the model related to teacher competence assessment and development done at the school. 8 schools participated in the piloting in school year 2018/19. The comparative case study in spring semester 2019 happened through gathering and analysing data such as written reports and working documents from school teams. In this research paper we aim to introduce the reader about the four phases of the model and the piloting process and results of the fourth phase – competence development. This paper presents a research project still in progress and will seek ways how such a model may be implemented in schools.

Keywords: Teacher competence management, Teacher assessment, Comparative case study, 21st century skills.

Introduction

A new compulsory education curriculum reform is being developed and is planned to be implemented in Latvian school practice with school

year 2020/2021 (Namsone, 2018; Skola2030, 2017). The reform is aiming to set new educational goals such as implementing student learning that leads to acquiring 21st century skills which is a widespread educational change in other countries (Care, Griffin, & Wilson, 2017). With changing educational purposes, teachers' instructional work at the individual level must also change accordingly, which imply important human capital implications including those related to teacher professional development and learning (Saavedra & Opfer, 2012). Previous research in Latvia has already showed that there is a gap between educational policy and actual teaching approaches in the classroom (France, Namsone, & Čakāne, 2015; Volkinšteine & Namsone, 2016). Despite 21st century skills being set as a particularly important aspect of innovation-intensive labour markets, consensus does not yet exist on how education systems should develop and assess teaching of these skills systematically (OECD, 2015).

In the Latvian context, up to date research-based evidence showing that teachers are equipped with the necessary competence and appropriate support in the context of these curriculum changes is limited. Educational researchers in Latvia have been focusing on topics such as in-service and pre-service teacher professional identity (Ivanova & Skara-Mincāne, 2016; Jermolajeva, Bogdanova, & Silchenkova, 2018), pre-service teachers (Daniela, Strods, Rubene, & Kalniņa, 2018), formation of teacher professional learning communities (Geske & Rečs, 2019) or school principals (for a review see Bluma & Daiktere, 2016). To our knowledge, in the context of new education changes such as teaching and learning 21st century skills there have not been empirical research on new approaches to teacher as employee competence management that would be school-based and with direct involvement from the school leaders.

Our previous empirical research on creating and piloting a teacher professional learning model in Latvian schools, proved the usefulness of continues, collaborative school-based PD as a way to develop teacher competence or parts of it (Namsone & Čakāne, 2019). In regards to the current state of teacher professional development in Latvia, large majority of teachers (95%) participate in PD in the form of courses and seminars, while 61% participate in training based on peer learning and coaching (OECD, 2019) proving the need to widen the PD practice that would be practice-based and done together with school leaders in the school site.

In this article we outline the procedure and results from the first piloting of a teacher competence management model (Zandbergs, et al., 2018) in selected schools e.g. cases (initial sample N = 8) that happened in the spring semester of 2019. This is done to gain insight of the model's applicability to be transferred and introduced in a wider school practice.

Background

Teachers and school leaders should facilitate, create and stimulate conditions for effective instruction at classroom level that is the operating core of any school (Scheerens, 2016, p. 77). According to Jaap Scheerens, Dutch educational and school effectiveness researcher, empirical school effectiveness research show that the following organizational conditions are the main effectiveness enhancing variables: school climate (achievement-oriented policy, a cooperative atmosphere and an orderly climate), clear goals concerning basic skills, frequent evaluations and time on task. Among other effectiveness enhancing factors are professional development, evaluation and reports for teachers (Scheerens, 2016, p. 97) and effective leadership (Scheerens, 2016, p. 78-79) therefor we include school leaders to participate in the piloting and learn about the model and its implementation in their own practice. Lastly, monitoring and evaluation should not happen in a way that it threatens teachers' professional autonomy (Scheerens, 2016, p. 81).

Following up on our previous research (Zandbergs, et al., 2018; Butkēviča, et al., 2018; Butkēviča, 2018; Butkēviča et al., 2019; Bērtule et al., 2019) we propose a teacher competence management model as an approach to help teachers and school leaders answer to the new challenges brought by the education curriculum reform and implement teaching and learning appropriate for students to acquire 21st century skills. The model outlines the management of employee competence within the organization and this article looks into the parts of the model that are more related with competence development. In our research teacher competence is defined as the integrated set of knowledge, skills and beliefs that manifest in a specific work situation (Kunter et al., 2013).

Even though organizations in Latvia tend to have established procedures for goal-setting and employee assessment, managers in organizations, including schools, use subjective approaches when managing goals and assessing employee competence. Based on our previous research findings, we propose that using competence as a building block describing both employees themselves and the goals they are required to reach provides organizations with several benefits. It makes the definition of the goals more precise and aligns better with the organization's employees. It allows for better forecast of reaching the goals at the start of the cycle. It potentially provides the organizations with the input for the improvement of goal-oriented employee development (Butkēviča, et al., 2018). When linking employee competence to organizational goals, managers can act upon employee competence gaps that may be identified at the start of a goal setting period or during it. This is related to our model's first phase

(see figure 1). Introducing an ontology-based model of linking goals to employee competences also provides the basis for developing a competence management model (Zandbergs, et al., 2018) and in this research stage we are piloting the model in school practice (formal education organization) to gain insight of its applicability to be transferred and introduced in these types of organizations.

In autumn semester 2018, outside expert-coaches started the comparative case study in eight selected schools. The eight pilot schools, participating in the whole project (period 2018-2021) were selected based on three criteria: 1) size as management workload rate and number of students, six groups (very small to very large) were identified and four of them are represented in this sample; 2) different administratively territorial division, five groups identified, all of them represented in this sample; 3) type of education programme provided by a school, seven groups identified, five of them represented in this sample (for a more detailed description see our previous research (Butkēviča, et al., 2018, 132).

Aim of the study in selected schools was to develop a teacher performance assessment framework for teaching 21st century skills that help determine teacher level of competence (scale 0–4) according to criteria developed (Bērtule, et al., 2019).

Teacher knowledge and beliefs (as part of competence construct) were assessed by using an online test with questions such as given classroom situations asking the teacher to tell what their typical action in those situations would be (Butkēviča, et al., 2019). Teacher classroom performance was assessed by lesson observations. Both assessment methods are based on the mentioned framework.

In the piloting, a model of competence management process is used, with four phases, where the initial phase is goal setting and final phase is teacher competence development therefor linking these processes with competence assessment. Our previous research shows that this link between goal setting and competence assessment and development in Latvian organizations including schools is missing (Butkēviča, et al., 2018). Each phase has a distinct form of process and its outcome (see figure 1) that the participating schools followed through. The first three phases will be shortly explained in the next chapter and the fourth phase in results chapter.
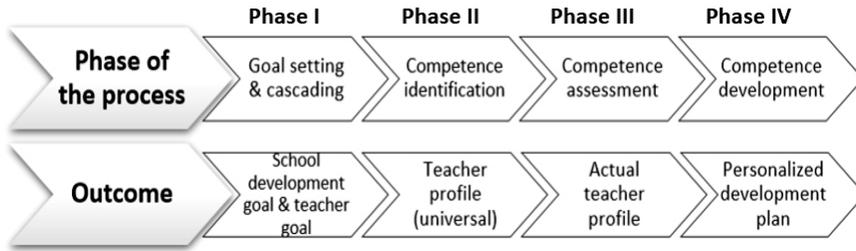
Figure 1. Phases of the competence management process and their outcomes (Butkēviča, et al., 2019)

Planning and implementation of piloting the teacher competence management model in selected schools (N = 8) happens over a longer period of time. In this research paper we aim to introduce the reader about the four phases of the model and the piloting process and results of the fourth phase – competence development. We compare the piloting schools as separate cases and make conclusions about the trends of how participating school teams are leading such a model, and what may be the risks and benefits of its implementation in wider school practice. **Following research questions are posed:**

1. To what extent did the schools succeed in implementing the teacher competence development plan?
2. What are the best practices done in schools when piloting the teacher competence management model?
3. What are the main challenges for schools and expert-coaches when piloting the introduction of the model into school practice?

Materials and Methods

Five expert-coaches from Interdisciplinary Centre for Educational Innovation at the University of Latvia (ICEI UL) collaborated with pilot schools throughout the piloting (school year 2018/2019). The expert-coaches have been involved in seven to 17 years of experience in designing and leading different types of teacher and school leader professional development and learning activities as well as developing teacher support materials (Namsone & Čakāne, 2018).

In *Phase I* (see figure 1) schools set their goals according to their own choice which happened in autumn semester, 2018. The goals are directly linked to student learning in the classroom related to teaching and learning 21st century skills (see table 1).

Table 1. Goals set by participating schools

School	Goal set by the school [summary]
01_V	Unified approach for student evaluation
08_Z	Student self-directed learning
07_N	Student self-directed learning
02_U	Improving textual literacy for students through teacher collaboration
04_S	Student self-directed learning
06_P	Student self-directed learning
03_T	Improving different elements of student self-directed learning
05_R	Lessons focused on students' learning result and their in-depth understanding of learning

In *Phase II* (see figure 1) competence identification happens. Involved expert-coaches identify the needed and appropriated teacher competence profiles according to the goals set in each school. A universal teacher profile for each teacher is created and it consists of selected categories and criteria on desirable level (scale 0-4) based on a theoretical category-criteria framework for teaching performance to develop 21st century skills (Bērtule et al., 2019) (see table 2).

Table 2. Phase II Competence identification: teacher universal and actual profile (example)

School 04_S	Accordance to school goal: Student self-directed learning			Teacher basic skills		
	Clarity of learning goals	Feed-back	Meta-cognitive skills	Structure of the lesson; choice of methods	Methodo-logical techniques, classroom management	Clarity of chosen learning content
Universal profile*	3	3	3	2	2	2
Actual profile* Teacher S_64	2	4	2	3	3	3
Actual profile* Teacher S_73	1	1	1	2	1	1

*(scale 0–4)

In *Phase III* (see figure 1) competence assessment is done through lesson observation and by analysing the lessons. This is how actual teacher profile is obtained. Expert-coaches are involved to assess participating teachers' actual competence where the assessment result is each teachers' actual

profile (see table 2) submitted to the school leaders. Phase II and III helps to recognize the teacher competence gap – difference between expected competence level (competence level needed to reach goals that are set) and the actual level. If necessary, schools can conduct their own assessments by using rubrics with descriptions of teacher performance levels created for the Latvian educational context (Bērtule, et al., 2019; Namsone, 2018).

In spring semester of 2019, the study in selected schools continues with the piloting of the teacher competence management model (see figure 1), more specifically, the model's fourth phase – competence development. This started at the beginning of January, 2019 with a joint workshop with leaders (principal with assistant principal) from each school and expert-coaches (see table 4). School leaders were introduced more in detail to the teacher competence management model. Then the following month, schools had time to form teams of teachers and deciding on their desired way of participating in the piloting. In the piloting, school leaders are given teacher assessment results (done and gathered from the previous semester by expert-coaches). Then schools received instructions for how to realize this competence development plan (see figure 2), rubrics with descriptions of teacher performance level and expert-coaches visited schools and did individual support sessions.

In Phase IV the expectation of the piloting is that school teams make teacher individual development plans and follow the next steps with the aim to minimize the mentioned competence gap. In the competence development, text in italics indicates examples, such as 'Assessment Method' may be a test, in our case it was lesson observation after which the next steps follow (see figure 2). With this phase the competence development continues until teacher universal and actual profile matches in so allowing the school to reach the set goal. Schools formed teams of teachers and school leaders who participated in the piloting.
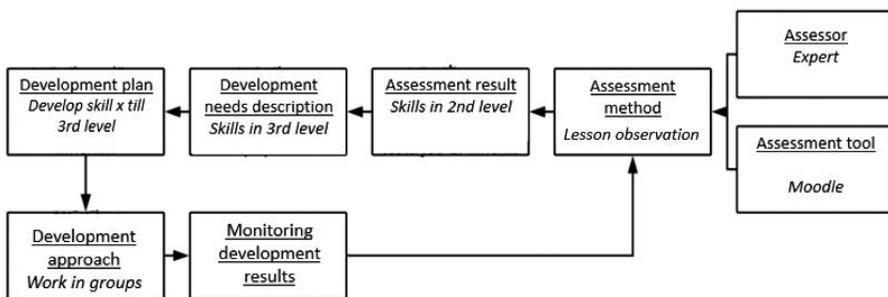

Figure 2. Competence development elements and their relationship (Phase IV)

Lastly, in June schools submitted written reports on their piloting experience based on the following criteria:

- Activities, events organized with the school teams
- Developments / improvements that school teams accomplished
- Obstacles that school teams faced
- Support needs
- Planned activities for next school year
- Involved teachers, other colleagues from the school (see table 3).

Table 3. Number of involved teachers and school leaders

School	Number of involved teachers	Number of involved school leaders
08_Z	18 (all school teachers)	2
07_N*	-	-
02_U	15 to 20	3
04_S	22 (all school teachers)	2
06_P	6	4
03_T	5	3
05_R	7	2
01_V**	-	-

*Full report was not submitted
** The school stopped participation in piloting

Expert-coaches interpreted the results. The reports are prepared by the assigned teacher team leader who also takes an administrative position in the school therefor in this research we analyse the competence development process from the school administration teams' point of view.

Table 4. Summary of support activities during piloting

Date	Activity	Aim of the activity
04.01.2019	Joint workshop with school administrative teams	Introduction to the piloting goal, logic, possible ways how to participate in it
04–29.01.2019	Schools forming teams of teachers, setting out desired ways of participation	Collect reports from schools to understand in what scale and format schools want to participate
29.01.2019	Sending out instruction to school teams	School teams have unified instructions to guide the piloting
01–28.02.2019	Expert-coaches visiting schools, electronic contact	Face to face contact between school teams and expert-coaches, individual support

Date	Activity	Aim of the activity
01–28.06.2019	Schools prepare reviews about the piloting process	Collecting written reviews and artefacts from schools
01–28.06.2019	Interpretation	Expert-coaches are reviewing the written reports to start analysis of piloting results, make comparison, identify risks and benefits

Results

Answer to the first research question: To what extent did the schools succeed in implementing the teacher competence management model?

Based on the instructions given at the start of the piloting, school teams linked teacher assessment results with further planning for competence development and thematically focused it around the goal that was set last semester. Some school teams did an additional independent teacher assessment round, mostly by conducting lesson observations, analysed the results with the help of the rubrics showing descriptions of teacher performance level and compared their assessment results with assessment results made by expert-coaches. Additionally, each school had an assigned expert-coach to guide the school teams on how to work with the rubrics and generally help through the piloting process. All schools that continued the piloting have made plans for how to continue the competence development (phase 4) in next school year. School teams used different teacher support materials thematically linked to their goal.

School teams formed different types of collaboration forms, for example, working groups in different forms, daily, weekly or bi-weekly meetings etc. Some working groups had assigned teachers who took a leader's role. In two schools (08_Z and 04_S) all teachers were involved. In school 06_P in weekly school meetings all teachers were introduced with the piloting progress.

School 01_V, after being introduced to the instructions of competence development, opted out from continuing their participation. Stated reasons were that this activity is too time consuming for them and that they have other priorities at the moment. One school did not submit a full report (see table 5). Two schools prepared individual development plans for participating teachers, the results of these activities are described in next paragraphs.

Table 5. Summary of written school reports according to proposed criteria

School	Assessment result	Description of development needs	Development plan	Solutions for de-velopment	Realization of the plan
06_P	Familiarized with the results	Formulated	Yes (electronical)	Made a plan	Individual lesson observation
05_R	Familiarized with the results	Formulated	Yes	Made a plan	Collaborative lesson observation
03_T	Familiarized with the results	-	Yes (electronical)	Made a plan	Teams were formed, collaborative lesson observations
08_Z	Familiarized with the results	-	Yes (electronical)	Made a plan	Collaborative lesson observation
04_S	Familiarized with the results	Formulated	Yes (electronical)	Made a plan	Collaborative lesson observation
07_N*	Familiarized with the results	Formulated	Yes	Made a plan	Made a plan
02_U	Familiarized with the results	Formulated	Yes (electronical)	Made a plan	Collaborative lesson observation
01_V**	Familiarized with the results	–	–	–	–

*Full report was not submitted
** The school stopped participation in piloting

Answer to the second research question: What are the best practices done in schools when piloting the teacher competence management model?

To answer to the second research question, two school cases will be shortly described. The two cases showed the most progress regarding the model's fourth phase.

School 06_P

This school is a high school with grades first to 12th with approximately 550 students, 59 teachers, located in one of the nine largest cities in the country, also called republic cities. The goal set in this school was that students acquire self-directed learning. The school is struggling with an aging workforce that is being replaced by a relatively young work

force – teachers with novice experience. The school leadership team decided to focus on novice teachers during the piloting. The school can be characterized as open to innovations and the school principal has a vision for modernizing the school's learning environment.

In the piloting four school leaders actively participated – the principal and three assistant principals. This leadership team were involved in all activities proposed by the expert-coaches and related to teacher competence assessment and development. They purposefully and with great interest realized the activities and recorded proof of all actions that they took during the piloting. At the beginning they planned to involve six teachers, but in the process more teachers were involved (exact number was not given in the report). Additionally, they informed all teachers about the piloting process in weekly meetings. Competence assessment results are collected about 20 teachers from this school.

School leaders first familiarized with the teacher assessment results, student learning results and the instruction. They planned the necessary actions based on the data, then introduced their plan to participating teachers. Teachers had one week to analyse, reflect about the plan, discuss it together and give feedback and suggestions about it. Two school leaders did teacher lesson observation, by using the given rubric. After the lesson observation, the principal had an individual discussion with the teacher and the expert-coach where they identified one main aspect of the teaching practice that should be improved and formed the basis for teacher's individual development plan. Each teacher set a task that should be done until the end of the semester. Involved teachers formed learning groups depending on their subject areas and who work with the same grades. In these groups, teachers created new classroom assignments for students and other activities supporting student self-directed learning in one selected class in a four-week period. When setting a goal and planning activities, the school leadership team is strictly gradual, that is, the goal is divided into specific, measurable smaller steps and deadlines.

However, this school struggled with getting the school principal and assistant principals to be involved more greatly due to lack of time. Also, the team was not sure about their actual progress because one semester is too short to determine if changes are actually happening. For the next semester, the school team plans to follow each teachers' development path more carefully.

Lastly, this school team shared their planned activities and weekly progress to all other colleagues thus spanning collaboration in the whole school; and pointed out that this collaboration has changed their understanding and ways of thinking, and made their activities more purposeful and focused on their goal.

School 04_S.

This school is located in a rural area, it is a basic school with grades one to nine, with approximately 200 students and 24 teachers.

The school goal can be divided into two parts. For teachers the goal was to introduce four basic elements in the student learning process – student learning goal, meaningful tasks for students, self-directed learning and development-oriented feedback for students. For students the goal was to introduce tools for assessing growth dynamic of their own self-directed learning. The tools would be used by students themselves for assessing their growth.

The school is open to innovations, they set clearly defined goals. The school leadership team is investing in their teachers and also implementing individual discussions with teachers.

In the piloting, the principal and assistant principal were involved, later the leadership team expanded to three people. They showed motivation to be involved both in data-based goal setting and in teacher competence assessment.

This school team adjusted the lesson observation sheet and planned to do lesson observations four times for each involved teacher. Additionally, an electronic data base for lesson observation results was created compiling information about the goals and the criteria accordingly. Similarly, as in school 06_P, each lesson observation was followed by an individual discussion where the teacher reflected about the weakest points in the lesson and set a goal based on that. Until the next lesson observation, the teacher aims to reach the goal that was set. School team did activities such as watching and analysing video recordings of lesson examples, modelled new lesson activities, lesson observation in their school and in two other partner schools.

At the end of this spring semester, teachers set individual goals for their competence development. Additionally, each teacher has a final individual discussion with a school leader. Not all teachers in the team are ready to analyse their own performance, some teachers perceived their individual competence development planning as "just another duty" and not as a possibility for growth. Similarly, as school 06_P, one semester is too short to determine if the activities have led to actual progress. In next semester teachers will plan their individual development plans based on data from lesson observations and will also plan how to reach their development goals within one semester. The school team also plans to create a teacher learning group.

Answer to the 3rd research question: What are the main challenges for schools and expert-coaches when piloting the introduction of the model into school practice?

School teams express the need for more support from expert-coaches or at least points out to the lack of sufficient support from them. There is a need for more time dedicated to learning as a way to bring in a more unified understanding about the model in the school and not only in the school leaders' level. For example, in the case of school 06_P in each discussion five to six school leaders were involved. The shared experience from pilot schools emphasises the need for high involvement of the school principal and his/her understanding of what it means to plan and follow through a teacher's individual competence development plan. For example, in school 03_T the principal delegated responsibility of the piloting to teachers. Another challenge is to guide school teams in how to use teacher assessment rubrics, teachers and school leaders still interpret the rubrics and teacher performance differently than expert-coaches.

Setting school goals, cascading the goals to teacher individual level, staff development is the responsibility of the school leadership team. As part of the piloting, school leaders were required to be ready to collaborate, go deeper into teacher competence development, invest into teacher growth. According to the data obtained, participating schools with a motivated leadership team showed better results, and the role of the principal appears to be the most important. At school 01_V, which stopped participating in the piloting, only one deputy principal was initially involved. School 07_N does not have a strong leadership team ready to collaborate with the principal. In school 02_U, during the piloting, there was a change of staff working in the school leadership team, with the main responsibility being delegated to one of the assistant principals.

The piloting process shows various experience regarding number of involved teachers. In this stage of the piloting, it was school teams' free choice to do such competence management. In the future it is planned that a school involves all teachers in their competence assessment and development. The process of piloting was affected by different factors - size of the school, number of involved staff from the leadership team and number of involved teachers, type of school goals. We don't have clear evidence showing if implementing the model would be more effective when all teachers are involved or only several groups of teachers. The school goals can be specifically focused on learning results of selected grade level students. This may help gain greater impact of improvements and more focused teacher collaboration and, in the long term, to follow the impact of teachers' competence development on student learning results.

A positive trend is that the pilot schools are starting to plan their teacher development that is linked to the topical school goals. Schools are organizing teacher learning groups, thus gaining a joint understanding of the necessary changes. However, it is important that the introduction of new knowledge and skills in the everyday practice of teachers is happening in a way that it has more impact on their classroom practice (Lipowsky & Rzejak 2012), thus a positive impact on student learning results. This is accomplishable through lesson observation, analysing the results and giving feedback to teachers, done by the leadership team or by teachers themselves. In doing appropriate lesson observation and analysis, appropriate criteria and rubrics are important. Schools received these together with the teacher actual profiles in the beginning of the piloting. From the consultations between school leadership teams and expert-coaches, it is evident that despite the high level of detail in the rubric describing levels and criteria, every school leader or teacher, without previous preparation and training, interpret teacher performance in the lesson differently. It can be discussed if this is due to the tradition that teachers have been evaluated summatively and not for development purposed. For example, in school 08_Z, school leadership team reported that teachers showed improvement of two levels higher, that have to be checked by expert-coaches. A solution for such situations would be to conduct joint lesson observations with expert-coaches and school leaders where they agree about the criteria and how to detect it; to have training for school leaders on how to analyse observed lessons. More experienced teachers could also be trained to do lesson analysis as a way to increase their capacity to give support to other teachers. The rubric should also be improved and adjusted to be more understandable for teachers and school leaders and used as self-assessment tool. Further research is needed for determining how such activities may strengthen the school capacity to develop teacher competence.

When compiling the results on how teacher professional development is being planned, we can conclude that it is not personalized enough, which is one of the competence management model's key elements. Only in two schools the involved teams set up teacher personalized development plans. In other schools, the teams don't take into consideration that teacher performance and learning needs differ, which can be seen from their actual profiles. There are schools, that leave it to the teachers themselves to set their individual goals, but the teachers lack the necessary skills or motivation to do it objectively. For example, in school 03_T, the principal received the assessment results (the actual profiles) from expert-coaches and gave the them to each teacher expecting that teachers will be able to define their own development priorities. The leadership team delegated to the high performing teachers to lead other teacher groups, but it was not discussed

with these teacher team leaders what are the other teachers' learning needs. As well as the competence development of these teachers were not planned.

Joint seminars and written instructions for school leaders for further activities are not enough. The school teams expressed that having an expert-coach available for consultation in the school is an effective way of support. This is indicated by school 04_2, which would had reached better piloting results if collaboration with the expert-coach had been more active. Whereas in school 06_P, the combination of greater investment and interest from both leadership team and expert-coach proved to be decisive for the school leadership team's growth that contributed to a successful piloting of the model.

Conclusions

The best practices from the pilot schools show that the teacher competence management model can be implemented into school practice if the school is open to innovations and if the school leadership team is investing in teachers and generally interested in supporting teacher growth. On the other hand, the piloting results show activities done by the school leaders that indicate a lack of understanding on how to develop human resources. This has been indicated by previous research showing that school principals in Latvia do not use human resource management techniques systematically as they lack necessary skills and require special training for that (Daiktere, 2012). It is necessary to continue researching what are the current practices of school leaders and their effect on teacher practice and growth and on student learning results.

It should be taken into account that school leaders contribute to student learning through their influence on other people or features of their school's organizational features (Hallinger & Heck, 1998). The pilot schools set goals related to student self-directed learning (or self-regulated learning) which is in line with what has been pointed out as one of the cornerstones of school effectiveness (Scheerens, Luyten, Steen, & Luyten-de Thouars, 2007).

The piloting of the teacher competence management model will continue in the autumn semester, 2019 in order to gain more insight in the model's and its teacher competence assessment instruments' applicability for school practice. It is still needed to explore the different factors that hinder or support the model's implementation into school practice in Latvia. Additional evidence is needed to determine if the used teacher assessment approaches (teacher test and lesson observation) can be used in schools independently as teacher self-assessment tools. Our experience from this piloting semester show that school team interpret the teacher assessment results differently.

Acknowledgements

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INFORMAL LEARNING FOR TEACHERS' PROFESSIONAL DEVELOPMENT AT SCHOOL: OPPORTUNITIES AND CHALLENGES

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ABSTRACT

Professional environment has changed dramatically during recent decades: it has become more dynamic, more complex and less structured. These changes are also applied to schools where teachers are required to work more with students and are given new responsibilities relating to management of the school. Also, the role of teachers in the classroom and the requirements for assessing teachers' professional performance have changed significantly. Formal learning carried out in a structured, purpose-led process usually does not meet the real needs of teachers' professional development, does not improve teachers' professional performance in classroom and does not have direct positive influence on students' learning outcomes. The formal learning of teachers is organised outside the real context teachers work in and does not allow them to reflect on their experience. Informal learning is offered as an alternative form of teachers' professional development that includes individual and collective learning activities which are carried inside or outside the school and are based on learning from other professionals, participating in informal conversations or sharing experience without a specific learning goal and process manager.

The aim of the literature review is to summarize the theoretical approaches of informal learning, focusing on several aspects of informal learning for teachers' professional development: different ways how informal learning can be implemented inside the school; factors that promote and hinder teachers' professional development through informal learning; the benefits and risks faced by teachers who are improving their professional competence by engaging in informal learning activities.

Keywords: Formal learning; Informal learning; Professional development; Learning at the workplace.

Introduction

The new requirements in education determine important changes that are happening not only in the curriculum students have to study at school but also in the teaching methods and strategies which teachers have to use to meet these requirements. Depending on the fact how effectively teachers learn new strategies, gain an understanding of the principles of curriculum

design and change their own perceptions about students' learning, it is possible to make conclusions about the sustainability of educational reforms and their impact on the quality of education. Many educational reforms have failed because teachers have been indifferent or refusing to change according to their prior learning experiences as students and their attitudes towards continuous professional development (Hoekstra & Korthagen, 2011).

Teachers' professional development needs are directly determined not only by structural reforms taking place in educational system but also by the changes in professional environment. The environment at schools has become more complex and dynamic, characterized by the need to address more diverse and less structured problems, and hence greater uncertainty (McLagan, 2008). As a result of these changes, the demands and responsibilities of teachers also have changed: teachers have to teach classes with an increasing number of students; there are more students with emotional, social and learning difficulties. Similarly, in schools, decisions are increasingly adopted in a decentralized way, with the direct involvement of teachers in school management issues (Lohman, 2000). Teachers need to improve their knowledge of curriculum and teaching methodology to ensure that students' learning outcomes meet the modern requirements (Jurasaite–Harbison & Rex, 2013).

In order to meet new learning needs of teachers, increase their motivation and provide a constructive feedback on their results, it is necessary to change the way teachers' professional development is organized at the workplace. The traditional model of structured, formalized and purposefully directed teacher learning does not always provide the necessary skills and knowledge to help them teach students in accordance with the new requirements. Often, such development is carried out formally, without a direct long-term impact on teachers' performance and students' learning outcomes (Sprott, 2019). However, the main goal of teachers' professional development is to help students to learn, to gain a diverse learning experience and improve their learning skills and academic achievements (DiPaola & Hoy, 2014).

Informal learning is offered as an alternative form of teachers' professional development model. It includes a self-initiated, voluntary learning activities at the workplace where mutual interaction between teachers helps to improve their knowledge and skills on specific issues. Usually informal learning is not externally managed and structured process, it is based on intensive use of the previous work experience and reflection on it (Lohman, 2006). Studies conducted so far have concluded that about 90% of teachers' real-time learning takes place informally, rather than through participation in structured learning activities (Lohman, 2000).

Methodology

The full-text scientific articles available in the EBSCOhost database in English, published between 2010 and 2019, are used in the literature review. Scientific articles have been selected using the following keywords: informal learning AND professional development, AND teachers, AND school.

According to the chosen keywords, 25 scientific articles have been identified in the database for the selected period of time, the content of which is related to the teachers' informal learning at the workplace. 10 articles have been selected for in-depth analysis which are directly related to the informal learning of teachers inside the general schools.

The literature review does not include the publications on teachers' informal learning in other educational settings, such as higher educational institutions or online. Other scientific articles referenced in the selected articles and available in EBSCOhost or other free access databases have been used in the literature review. The use of these articles is necessary for a deeper understanding of the process of informal learning inside the school, with a reference to the authors who have started to research informal learning in the context of teachers' professional development.

The aim of the literature review is to explore the topicalities of informal learning in the general schools and to identify the key benefits and risks that informal learning can bring into professional development of teachers. To reach this goal, the insights expressed in the articles have been systematized and described in 4 categories: the characteristics and the forms of teachers' informal learning at school; factors that promote and hinder informal learning at school; the benefits of informal learning at school; the challenges of informal learning at school.

Teachers' informal learning at the workplace

The quality of education depends on how skilled and motivated teachers are to improve their professional knowledge and skills throughout all their career (Vanblaere & Devos, 2016). It is related to a rapidly changing professional environment, where new requirements for school graduates are appearing: students have to have collaborative skills, problem-solving skills, creative thinking, critical thinking etc. The teachers' individual competence and professionalism determine how successful the reforms in the education system will be and how high the level of students learning outcomes will be (Cheng, 2017). During the previous decades there has been a growing and continuous demand for teachers to improve their knowledge and skills on curriculum and teaching methodology (Jurasaite–Harbison & Rex, 2013).

Teachers have to be ready to improve their professional performance, to challenge their existing perceptions and mindset about teaching and learning, and become learning agents for themselves and their students. Thus, the traditional way of teachers' professional development, according to the principle "one size fits all" workshops, is no longer able to meet the real professional development needs of teachers (Patton, Parker & Tannehill, 2015). Formal professional development is not capable to eliminate the growing gap between the knowledge and skills teachers need in the real working environment and those that can be learned through formal training activities (Tynjälä, 2008).

Participation in formal learning activities (in-service training courses, seminars, lectures, workshops etc.) is still a common practice for teachers' professional development in schools. However, the impact of formal learning experience on teachers' performance in the classroom is limited. Researchers have concluded that teachers rarely use the methods and techniques they have learned in formal trainings (Wideen, Mayer-Smith & Moon, 1998). This is due to the fact that during formal learning activities there is no time for purposeful reflection on teachers' professional activities to make a transfer from the new curriculum to their professional practice.

Teachers report that they learn much more in their daily work with students, independently experimenting with teaching and learning strategies, assessing their impact on students' learning outcomes and learning from their mistakes (Lohman & Woolf, 2001). Substantial part of the teachers' professional learning takes place in the classroom, working with students where teachers spend the most of the time of their practice. Therefore, teachers have to be professionals who are learning from their previous experience (Lund, 2018), trying new strategies and reflecting on the results.

Informal learning is the acquisition of new professional knowledge and the development of skills outside the structured and institutionalized learning environment. It takes place in the process of voluntary cooperation and exchange of experience, where employees of one organization interact and learn from each other. Informal learning does not involve systematic, pre-planned repetition of routine activities, it is not structured and often does not have clearly defined learning goals (Marsick, Watkins, Callahan & Volpe, 2009). The goal of informal learning is to provide continuous and goal-oriented professional development at the workplace, taking into account the real learning needs of the stakeholders and using the professional resources available within the organization (Tynjälä, 2008).

Informal learning is characterized by indirect, unplanned and voluntary learning, which does not highlight the person who teaches the new content (Eraut, 2004). Informal learning is implemented as a part of a daily learning

process where teachers, through individual actions or collaboration, acquire the knowledge and skills they need in a concrete professional situation. The goal of such learning activities is not to learn and implement specific curriculum, and it does not take place in a learning environment specifically designed for learning purposes. Informal learning at school takes place through individual activities (getting acquainted with professional literature and observing classrooms of other teachers) and collective activities (conversations with colleagues, students and parents, mentoring programs, participation in teacher networks and learning groups) (Desimone, 2009).

During the activities of informal learning teachers have an opportunity to choose their own learning goals as well as the learning strategies they are going to use. In the process of informal learning, participants set learning goals themselves, determine how these goals will be achieved, and evaluate how the goals have been achieved (Cross, 2007). Usually, such professional development is based on a specific class or school context, which allows teachers to understand the real learning needs better, reflect on their experiences and learn from their colleagues (Richter, Kunter, Klusmann, Ludtke & Baumert, 2011). Thus, teachers who want to develop their competencies through informal learning have to understand the context of their school and have to be ready to reflect on their own experience and practice with other teachers.

The goal of informal learning within a school is to make the knowledge and skills accumulated by individual people to a wider range of professionals available through the elements of social interaction. In this way, knowledge is constructed in a specific context, so it is more commonly used because it is directly related to the participant's personal experience than the knowledge acquired through formal learning outside the concrete context of the school (Eraut, 2004).

Unlike formal learning, where the acquisition of new professional knowledge and skills is an act of individual behavior, informal learning takes place within a learning community (Lave & Wenger, 1991). In the context of the school, informal learning is an act of social participation, where teachers are learning from their own previous experience and expertise, which has been accumulated in the organization. In the model of informal learning, the experience of each teacher acquires value of learning potential which other colleagues can use to meet their learning needs.

Jurasaite–Harbison and Rex (2013) point out that informal learning takes place in several dimensions, for example, the authors distinguish proactive and reactive informal learning. In the framework of proactive learning, teachers themselves set their own learning goals; require regular advice and feedback from colleagues; independently seek and explore sources of information to prevent teaching-related problems. Meanwhile,

reactive informal learning is an unintentional professional activity where teachers respond to situations that have already taken place; they do not set their own learning goals and start to learn from their colleagues when problems have already occurred. The authors also separate the individual and social dimension of informal learning, where the first focuses on individual activities to improve one's performance, while the other is dependent on collaboration with colleagues and joint participation in the assessment of collective experience.

Teachers pursue their professional development through different informal learning activities: they are collaborating with schools' leadership team and other teachers; sharing experience of teaching methods and techniques used with students; attending school meetings; observing classrooms of other colleagues; participating in learning group activities, etc. (Kwakman, 2003). In the school environment, informal learning also takes place between students and teachers, where both learn how to adapt, cooperate and respect each other. Teachers are thus acquainted with their students and understand their learning needs better (McNally, Blake & Reid, 2009).

The above mentioned examples of informal learning provide intensive feedback, reception and use of feedback to improve the performance. However, teachers' informal learning at school is not always structured or implemented as an autonomous learning process. School leadership team often formalizes and structures informal learning to ensure its regularity and long-term impact on students' learning. Researches have shown that informal learning is more effective and consistent with school vision and goals if it is organized in a more formal framework, such as learning projects, where teachers jointly address and analyze specific learning-related issues, learning from each other and finding common solutions (Poell , 2006). However, efforts to structure informal learning at school can disrupt existing social relationships among teachers and create a negative impact on mutual learning outcomes (Lohman, 2000).

Factors influencing teachers' informal learning at the workplace

The effectiveness of teachers' informal learning at school is influenced by individual factors related to teachers' willingness and ability to evaluate their professional experience, readiness to learn from other colleagues' experience and to use the feedback they receive to improve their performance. It is also affected by administrative factors related to the way in which professional development of teachers is organized and supervised at school, and what kind of professional resources are available to teachers to meet their current development needs (Carney, 2000).

Informal learning is a multidimensional concept that includes organizational and personal elements as well as elements of interpersonal cooperation. Organizational factors are related to the availability of professional resources at school, such as the availability of the necessary information for teachers and the time available for them to learn from other colleagues; similarly, informal learning is influenced by the culture of the school's internal organization and the existing relationships of trust between teachers (Vanblaere & Devos, 2016). Skills and knowledge, and the learning experience that teachers gain through informal learning at school, are influenced by the process of socialization that is based on the norms and values that exist within the school (Eraut, 2004).

Personal factors determine the ability of teachers to develop new knowledge and experience, learning from the experience of other professionals, willingness to try new teaching strategies, and learn from their personal mistakes. Interpersonal co-operation factors, on the other hand, are related to how co-operation between teachers is developed and maintained inside the school and how teachers make common agreements about their professional development needs and learning goals for their students (Vanblaere & Devos, 2016). Informal learning is directly influenced by teachers' willingness to work together with their colleagues, which is determined by their understanding of learning goals students need to achieve (Patton, Parker & Tannehill, 2015).

Lack of time is mentioned as one of the factors that can limit the outcomes of informal learning at school. The role and responsibilities of teachers have changed significantly over time, and teachers have more responsibilities that are not directly related to classroom work, so it is necessary to spend more time on purposeful professional development. Informal learning is effective if there is time that can be spent outside the classroom when teachers can meet for informal conversations, learn from each other and plan learning activities together (Lohman, 2006). It is important for teachers to have time and space where they can reflect on their experience and get to know other colleagues (Sprott, 2019).

The physical environment and infrastructure at school have a direct impact on the outcomes of informal learning for teachers. In situations where the physical distance between teachers' classrooms is high, teachers' access to mutual learning resources is restricted. As a result, professional isolationism develops, where each teacher acts autonomously and solves problems independently regardless of the amount of experience and knowledge already accumulated at school (Sprott, 2019). In order to avoid the teachers' isolationism, it is advisable to place closer teachers of the same grade or similar subjects in order to provide them an opportunity for informal consultations and exchange of experiences.

The ability to learn from the experience of other professionals, both within and outside the school, directly determines the outcomes of informal learning. Researches have shown that teachers who are unable to interact with other colleagues to construct new knowledge and learn from others' experience are lagging behind those who can do it (Slotte & Tynjala, 2003). Involvement of teachers in the informal learning process is determined by the open, positive and collaborative atmosphere at school and the readiness of teachers to engage with other colleagues (Wohlfahrt, 2018). In cases where the school internal environment is closed, and colleagues feel more like competitors than members of a unified learning community, informal learning becomes a formality without a direct impact on teachers' performance in the classroom and students' learning outcomes.

It is also important for teachers to reflect on their experience and to receive feedback from others, because during the informal learning new knowledge is constructed by evaluating previous experience to make decisions about the improvements to be made in the future. Regardless of the way in which the new knowledge is acquired, it is less important what teachers know, rather than how they can apply the acquired knowledge to new learning situations. In order to carry out this professional transfer, teachers need the skills to reflect on their experience, as well as receive and apply feedback in the short term to make specific improvements in their pedagogical practice, and systematically evaluate their progress in the long term (Eraut, 2004).

School leadership activities are also crucial for creating an informal learning environment and achieving results. Higher results are achieved by schools where school management is focused on creating a culture of teachers' collaboration and demonstrates an example of continuous professional development through learning from others' experiences (Cheng, 2017). School management, which helps teachers to recognize their professional development needs, encourages them to learn from the best practices and assesses teachers' performance not only in terms of student learning, but also in teacher's personal growth, creates a school as an effective learning community (Harris & Jones, 2010).

For the school to become a professional learning community with continuous professional development of teachers, a culture of trust in the school is needed that provides openness among teachers and the opportunity to learn from the mistakes that have been made (Vaessen, van den Beemt & de Laat, 2014). Researches have shown that teachers are better at their learning at school when school leadership and teachers have developed a common vision about professional development, created a system of shared responsibility for achieving goals, and maintained values and norms that ensure high quality social relationships among teachers (Jurasaite–Harbison & Rex, 2010).

Benefits of teachers' informal learning at the workplace

Teachers' informal learning usually takes place at school, so teachers have the opportunity to learn in a real context, determining what content they want and how they are going to learn it. Teachers are given greater autonomy to define their own learning needs and they take full responsibility for the results of their professional development. Wohlfahrt (2018) points out that the biggest problem with formal professional development is that the curriculum that teachers study is not linked to a specific context and is not based on the real learning needs of teachers. In contrast, informal learning provides a direct link to the real challenges that teachers are facing in their everyday practice, so they are more open and motivated to learn how to solve these problems.

As a result of informal learning, the school is transformed into an effective learning organization where continuous professional development of teachers takes place, and each teacher's previous experience is seen as a value with important learning potential. In the learning organization, teachers are sharing their experiences and exchange pedagogical literature; they are helping to solve each other's professional problems; teachers are having discussions about professional issues and jointly looking for ways how to improve their performance by learning from the best practices in the organization (Wenger, McDermott & Snyder, 2002). In schools that are based on the principles of a learning community, teachers are helping each other to identify the real needs of professional improvement (DuFour & Eaker, 1998) as a result of an intensive exchange of experiences and reflection, providing the opportunity for them to learn practical and useful content. As a result of informal learning, the relationships of trust between teachers is strengthened and their sense of belonging to the community is promoted (Hanraets, Hulsebosch & de Laat, 2011).

Informal learning is a natural way for teachers to improve their professional skills, which shows the results in a long term. If formal learning is implemented in the form of individual learning events, such as lectures or seminars, informal learning is the result of everyday activities carried out by teachers within the school. This means that informal learning is a continuous process of development through which teachers develop their expertise, acquire the necessary knowledge and develop skills (Vaasen, van den Beemt & de Laat, 2014). That kind of learning leads to strong social relationships between teachers because every teacher is seen as a learning resource that can influence overall learning outcomes of the school.

Informal learning offers a variety of learning opportunities for teachers where everyone can choose the one that suits them best. The professional development of teachers can happen as giving advice for other colleagues;

reflecting on their professional practice and analyzing the performance of other teachers; providing and receiving feedback from others; engaging in informal discussions on educational issues; commenting on opinions expressed by other professionals, etc. (Tammets, Pata & Laanpere, 2013). It means that informal learning is more flexible than formal learning and can be adapted to a wider range of teachers' professional development needs (Eraut, 2004).

For informal learning to be effective and to achieve goals, teachers need the skills to provide, receive and apply feedback to improve their performance, reflect on their own and other learning experiences, critically evaluate their professional activities, interact with others, and learn from their own and others' experience. Thus, informal learning allows not only to apply but also to develop these skills, increasing the personal effectiveness of teachers. Teachers with a higher level of personal efficiency are better at planning and organizing their work, they are more open to new ideas, experiments and changes. They also show better results in working with students with learning difficulties (Van Veelen, Sleegers & Endedijk, 2017). Informal learning at school helps teachers to improve their reflection, self-organization, collaboration and social skills (Hanraets, Hulsebosch & de Laat, 2011).

Unlike formal learning, which is often initiated by school management, informal learning is based on the personal initiative of teachers and is carried out on a voluntary basis. In situations where teachers define their learning goals themselves, make decisions about strategies that will be used and choose partners to achieve these goals with, teachers take more responsibility for their professional development, which increases their motivation to learn. At the same time, it envisages the development of a democratic school management system that stimulates the teachers' participation in the learning process and school management, ensures responsibility for the achievement of school goals and motivates teachers to learn from the experience available in other professional contexts outside the school (Vaessen, van den Beemt & de Laat, 2014).

The implementation of informal learning consumes less financial resources than the formal learning process, as it takes place in an unscheduled and random way, and the experience and knowledge already accumulated at school is used in the learning process. By learning in a formal way, the knowledge and skills acquired quickly become obsolete and do not meet the professional standard, so teachers must constantly look for new ways how to update these skills (van Veelen, Sleegers & Endedijk, 2017). The successful process of informal learning at school, on the other hand, involves continuous learning from each other, engaging in day-to-day duties and collaborating with colleagues. Informal learning at school

takes place using the infrastructure already available, rather than requires new infrastructure adapted specially for learning purposes.

Challenges with teachers' informal learning at the workplace

Teachers' informal learning at school is influenced by a variety of factors, such as the school's vision, learning traditions, the infrastructure available for learning, school management, and the school's professional relationships with teachers (Jurasaite–Harbison & Rex, 2010). Teachers often have limited opportunities to organize their professional development according to their learning needs and goals, which is limited by the formal framework teachers work in. Not always the vision of schools' management is consistent with the teachers' vision of what knowledge they should acquire and what skills they need to develop to become better professionals. This may lead to situations where training activities offered by school leaders are imposed on teachers and do not happen on a voluntary basis.

Unlike formal learning, where the curriculum is strictly defined, the desired outcomes are defined and a specific learning strategy is chosen, informal learning is a less structured process, the results and effects of which are difficult to measure. Ideas and solutions that teachers gain through informal learning do not always produce immediate results: they do not change the teacher's performance and do not improve students' learning outcomes, and their impact takes time to be measured (Evans, 2019). Thus, the impact of informal learning on teachers' practice is difficult to measure and to determine whether and to what extent participation in such activities has improved teachers' professional performance in the classroom.

The professional development of teachers is not related to learning of new content or improving specific skills, but it is also determined by the values and personal attitudes teachers have towards continuous learning and improvement of their professional competence. The learning climate established at school is important: if teachers value mutual cooperation and learning from each other, they will be more willing to engage in informal learning activities (Lohman, 2006). Teachers are used to participate in formal learning activities that is why there is a risk that teachers will not engage with colleagues and will not take a part in collective activities at school, thus reducing their informal learning opportunities.

Informal learning means that teachers acquire new knowledge and skills through active dialogue and collective reflection (Sprott, 2019), which is not possible if teachers support learning that is previously planned, externally managed and structured. Teachers' attitudes towards their professional development are also influenced by their own previous experience as participants in the learning process. Here are important teachers' personal

perceptions of how new knowledge is acquired and how involved participants should be in order for learning to happen: as a passive listener or an active partner (Rigelman & Ruben, 2012). Teachers who prefer to learn by acquiring readymade knowledge from other professionals will not participate in informal learning activities where learning is a process of active knowledge construction and includes evaluation of existing practices in the organization for personal growth (Paavola, Lipponen & Hakkarainen, 2004).

Informal learning requires individual responsibility of teachers for identifying their learning needs, setting learning goals and selecting strategies to achieve these goals. The intellectual capacity of teachers to engage in learning-related issues is not always sufficient. Informal learning relies on teachers' ability to organize and manage their own learning without the direct support of others. However, not all teachers have advanced self-regulation skills (Marsick et al., 2008), which lead them to rely more on the claims of others rather than on their own actions. In the school context, the effectiveness of informal learning is diminished by situations where teachers do not have the necessary knowledge and skills that are expected of them at school and national level (Lohman, 2000), such as the ability to provide, receive and use feedback, learn from their own and colleagues' experiences etc.

As informal learning at school usually happens as a result of teachers' interaction, its effectiveness is determined by the quality of relationships among teachers and past experience of learning from each other. Harris & Jones (2010) point out that teachers' learning at school is hampered by negative previous experience with non-professional feedback and evaluation of performance after visiting classrooms. The informal learning process at school is not monitored and managed externally, so it is up to colleagues to build mutual trust and respect for long-term informal learning. As a result of negative cooperation, teachers consider informal learning to be an inefficient time-consuming exercise that has no direct impact on their professional performance and student learning outcomes.

In the context of informal learning, good practices are highlighted at school and teachers are learning from each other's previous experiences. However, there is a risk that the exchange of experience may result in an unwanted habits and practices that are difficult to monitor and eradicate (Dale & Bell, 1999). Informal learning is not guided and monitored, nor does it have clearly defined learning objectives and reference systems, so teachers take on practices that do not always improve students learning experience or help teachers better fulfill their professional responsibilities.

Slotte, Tynjälä & Hytönen (2004) emphasize that informal learning is not sufficient to provide all the necessary knowledge and skills, because

not all of the competences are already present in the organization at the time of learning. In the context of teachers' professional development, it means that there is a risk of internal circulation of past experience that preserves existing practice at school, maintains the status quo and does not provide professional growth. Therefore, informal learning needs to be complemented with the elements and content of formal learning (Vaessen, van den Beemt & de Laat, 2014). Although informal learning provides teachers with specific knowledge and skills, they are linked to a specific situation and are not widely used, as learning in one context is difficult to transfer to another situation (Tynjälä, 2008).

Another limitation of informal learning is that usually such professional development happens unconsciously. Learning participants are unaware of the specific activities and ways in which they have acquired new knowledge, developed skills and attitudes (Simons & Ruijters, 2004). By learning informally, teachers cannot assess their learning experiences, and it is not clear which cooperation practices should be stimulated and continued at the school, and which cause undesirable effects and should be discontinued. Informal learning usually takes place invisibly and unknowingly, so learners often do not perceive it as a learning (Eraut, 2004). This creates the prerequisites for mutual learning and exchange of experiences at school to be seen as a formality rather than a real opportunity for concrete professional development.

Conclusions

Teachers' informal learning at workplace can happen in different forms: observing classrooms of colleagues; providing and receiving feedback; engaging in an exchange of experience; reading pedagogical literature; participating in learning groups, etc. However, the potential of informal learning in schools is not being fully exploited, because the teachers' learning has been developed as more formalized, externally managed and structured process, although a large proportion of teachers' professional knowledge and skills are acquired in collaboration with their peers and reflecting on their previous experience.

Summarizing the scientific literature, it can be concluded that in the context of informal learning, teachers themselves choose the objectives and formats of their professional development and partners from which they are going to learn. Such learning improves teachers' personal effectiveness and motivation for learning, promotes school membership, develops reflection, collaboration and feedback skills. Similarly, informal learning allows to adapt the content and process of learning to the real development needs of each teacher, while delegating responsibility for learning outcomes.

However, in the context of informal learning, there is a risk that teachers take over unwanted professional practices and habits that do not improve their performance or have negative effects on students' learning outcomes. Informal learning is often unintentional and is a by-product of other activities, so it does not always have a specific purpose and a clearly defined criteria for measuring the impact. Such teacher learning is not always recognized as an effective, full-fledged and goal-oriented professional development.

In order to study teachers' informal learning at school, the researchers use qualitative research methods – deep interviews with teachers or school management, analysis of teacher reflection magazines, or focus group discussions –, but they do not always provide objective information about the impact of informal learning on teachers' performance and student learning outcomes.

Questions for futher discussion

It is important to combine the elements of formal and informal learning in order to ensure goal-oriented and effective professional development of teachers at school. If formal learning provides teachers with new general knowledge and skills, informal learning facilitates their transfer to daily work and application in specific learning situations. However, the challenge for the future is to change the usual practice in schools, where teachers' professional development is seen as a formalized, time-controlled and externally managed learning process, rather than a mutual learning whereby teachers themselves voluntarily take responsibility for setting learning goals and developing an action plan to achieve them.

It is important to strengthen the professional competence of school leadership team in order to create an effective, goal-oriented informal learning system at school. It is the school management's responsibility to demonstrate examples of good practice by learning from colleagues, providing and receiving feedback and facilitating regular exchange of experiences between teachers. Therefore, the question is whether the school management's competence in designing such a system is sufficient for informal learning to become a daily practice rather than a formality without a direct impact on teachers' performance and student learning outcomes.

The prerequisite for informal learning is the personal motivation of teachers and their interest in continuous learning, which is determined by their previous learning experience and attitudes towards their professional development. In order to develop their competences through informal learning, teachers must be prepared to use the best practices available at

school, learn from other professionals, and set self-directed learning goals. In the context of the teachers' professional development, it is important to think about development of collaborative, planning and reflection skills so that informal learning becomes a resource for teachers' personal growth and school can be transformed into an effective learning organization.

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REREADING FRESHMAN-YEAR BLOGS: THIRD-YEAR PRE-SERVICE STUDENT TEACHERS REVIEW THEIR FIRST-YEAR REFLECTIVE BLOGS

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ABSTRACT

In recent years, there has been increasing evidence that the use of blogs in diverse academic contexts is becoming more commonplace, particularly in teacher education. In this context, the blog is seldom used as a study journal in which pre-service student teachers document relevant information from college courses and practical work at the school, publish reflective records, voice their opinions regarding educational issues, and express their feelings and emotions vis-à-vis academic study. Moreover, since scholars have portrayed the blog as a space where discourse can occur among learners, between learners and instructors, as well as between learners and the larger internet community, it seems that teacher education may consider blogs to serve as platforms for encouraging both online and face-to-face communication and social interaction. The current study examines student teachers' perceptions regarding the contribution of the blogs they had written earlier in the teacher education program. To this end, 14 student teachers who were about to complete their third year of studies were asked to reread their freshmen year blogs. Next, participants were interviewed about the contribution of the blog to their training. Qualitative analysis of the interviews revealed three major ways in which the blog writing assignment had affected the teacher-education process, according to their retrospective views. Specifically, these participants found that the blog writing assignment was effective for the purposes of reflection, developing writing skills, and peer learning and sharing. Recommendations for teacher-educators regarding the contribution of blogs are discussed.

Keywords: Blogs, Reflection, Writining skills, Teacher education.

Introduction

The integration of various types of blogging activities in the course of teacher-education programs has frequently been addressed through empirical studies. The majority of the research that examined the value of blog integration in the teacher-education process referred, for example, to conducting a blog during the teaching practicum, recording one's reflections after a particular experience in the field, blogging as a component of a course on peer learning, or for the purpose of encouraging reading

(Nambiar & Thang, 2016; Tang & Lam, 2014; Top et al., 2010), Yukselturk & Inan, 2010). The goal of the current study was to examine student teachers' retrospective perceptions regarding the value they attributed to the blogging activity in the teacher-education process.

Literature Review

Blogs

A blog (short for *Weblog*) is an Internet site in which people can keep an online journal, by logging in – or *posting* – their experiences, personal news, and items of interest. These posts can then be perused by Internet surfers, who are invited to read and react to the content of the posts by posting their own comments (referred to as *talkbacks*). Those who write and record their thoughts and experiences are called *bloggers* and the entire collection of blogs on the Internet is referred to as the *blogosphere*. There are three characteristics that are common to most blogs: they contain a chronological narrative presented in reverse order (whereby the latest blog post is the first on the page); the contents in the post are related to the blogger's real-life experiences and thoughts; and posts are updated and uploaded to the blog at regular intervals (Sim & Hew, 2010). It is customary to classify blogs according to four dimensions: (1) personal-individual (log network: personal online diary of one blogger), (2) private-public (group support: team of bloggers discussing personal matters), (3) topically-individual (column: a blogger's personal interpretation of a new theme with each entry), and (4) topically-public (shared content: community of bloggers writing about local and global social matters) (Krishnamurthy, 2002).

All blogs share the following characteristics: individual ownership (the blogger is responsible for publishing and editing content, determining readers' rights, and designing the blog), hyperlinked post structure (the blog permits the creation of links to external information), updates displayed in reverse chronological order and the creation of an internal blog information search according to different categories and tags).

The Value of Blogging in Teacher Education

Empirical studies have demonstrated a variety of possible advantages of integrating blogs into the process of teacher education. Nonetheless, findings have not led to a decisive conclusion (Tang, 2013). On the one hand, it was found that blogging can help improve student teachers' reading, writing, and critical thinking skills, and that there is benefit to providing student teachers with this platform (Biberman-Shalev, 2018; Deng & Yuen, 2011; Osman & Koh, 2013; Stoszkowski & Collins, 2017).

Furthermore, integrating blogging activities into the teacher education process allows for flexibility in terms of the time and location in which the learning takes place, and it has been shown to increase learning satisfaction, improve academic achievements, and contribute to a more profound understanding of the materials learned, as well as offering an opportunity to share experiences with lecturers and peers (Chu et al., 2012; Kirkwood & Price, 2014). On the other hand, there is evidence that blogging is not an effective means for advancing the teacher process, especially as this pertains to the development of higher-order reflective practices (Jones & Ryan, 2014; Xie et al., 2008).

A few studies have indicated that blogging has a unique influence in terms of strengthening student teachers' sense of self-efficacy. Thus, for example, a study conducted in Switzerland found that student teachers who kept a blog focusing on problem solving in the course of their practicum indicated a higher degree of self-efficacy compared to their peers who reported on their experience only at the end of the practicum. Researchers' explanation for this finding was that by documenting their ideas for solving problems, student-teachers felt they had more control over the practicum experience (Petko et al., 2017).

Based on this review of the literature, it appears that the majority of studies that examined the value of blog integration in the teacher-education process referred to the use of blogs at a given point in time. Frequently, however, once the practicum or the theoretical course is over, the blog is archived and forgotten. The focus of the current study was on the student-teachers' retrospective views of the blogging experience and its contribution to their professional training. Hence, the following research question was formulated:

- From the vantage point of retrospective reflection, what were third-year student-teachers' impressions of and what value did they attribute to the blogging activity in which they partook in their freshman year?

Methods

The methodology employed in the current study was the naturalist-qualitative paradigm, rendering a phenomenological, retrospective longitudinal study (Flick, 2004). This was considered the most suitable approach for examining the retrospective perceptions of student-teachers regarding the value of the blogging activity conducted in their first year in the program. Retrospective studies ask participants to look back at events and issues experienced in the past. The principal instruments used to collect data in this type of naturalistic study are interviews and conversations, documents, memos, and written logs (Creswell, 2005).

Background of the Study

The study was conducted in a teacher-education college in Israel. The training program is three years long and includes theoretical courses, courses on the teaching of various disciplines, and a practicum, which is conducted at a specific school, once a week throughout the three-year period. The first-year practicum of the student teachers in the current study was conducted in an elementary school, where they spent an entire day once a week for a period of two semesters (a total of 24 days of practicum). In that year, their practical assignments included planning a one-on-one lesson with a school student (by the end of the year, an additional pupil joined the lesson), carrying out the lessons they had planned, and receiving feedback about the lesson from the pedagogical counselor and from peers. In addition, the student-teachers conducted observations and met with other staff members to plan an educational activity at the school. The entire practicum, including all of its components, was documented in the form of a personal blog.

These blogs were not published for the perusal of Internet readers in general, but rather could be accessed only through the course website, featured on the college's online platform, a Modular Object-Oriented Dynamic Learning Environment (MOODLE). One of the reasons for keeping the blogs closed to the general public and open only to other members of the course had to do with maintaining the rules of ethics, so as not to reveal information about the school, the pupils, or the staff. At the same time, there was concern that publicizing the reflections of student-teachers would be detrimental to the practicum process. Course participants were asked to write a blog post once a week, reflecting on their specific experiences. Occasionally, photographs and video clips taken during the practicum, as well as links to other relevant websites, were also posted to their blogs.

In the current study, the focus is on two points in time in the course of the teacher-education program. The first point in time was during the participants' freshman-year practicum at an elementary school. In the course of that year, the researcher fulfilled the function of pedagogical counselor for this class of student-teachers and provided weekly feedback to their blog posts. The second point in time was towards the end of the participants' third and final year in the program, i.e., following three years of theoretical study and practical experience. In the course of the participants' third year, the researcher was not involved in any aspect of the group's learning or teaching experience. The researcher approached the original group towards the end of the second semester of their third year and asked them to participate in a study that required each of them to go back and reread their own blog, in which they had reflected on their first-year practicum experience. Next, each participant was interviewed

and asked about the usefulness of keeping a blog in their first year of the program.

Participants and Sampling

Participants were 14 student-teachers who were completing their third year of the teacher-training program. All were women affiliated with the secular Jewish sector. Their ages ranged between 22 and 27 years, and they all had focused on preparing to teach at the elementary-school level. They taught a range of disciplines: five taught science classes, four taught math, three Bible studies, and two taught literature. Student-teachers in their first year of the program do not practice teaching in their particular discipline, but rather at this first stage, they all teach language arts; only in the second and third years of the program do they engage in a practicum involving their particular discipline. Participants were recruited through a convenience sampling method (Cohen et al., 2007; Creswell, 2005).

Data Collection and Analysis

The process of data collection for this study was conducted in two phases. In the first phase, the student-teachers were asked to return to the blog they had written in their freshman year using the college platform. In the second phase, the researcher conducted semi-structured interviews with each of the participants.

The interview questions referred to several aspects that could retrospectively shed light on the value of the blogging activity in the context of the teacher-education program. To ensure the participants' privacy as well as their understanding of the research in general, they all received an explanation regarding the study and its goals, and the anonymity of the participants (Cohen et al., 2007 ; Spradley, 1979); subsequently, they all indicated their willingness to participate. It is important to note that at the time of the study, the researcher was no longer acting as the pedagogical counselor to this group of students, had completed their evaluations two years earlier, and at the time of data collection had no other teaching relationship with the participants. In addition, the recruited student-teachers were told that they could choose whether or not to participate in the study and could withdraw at any time if they wished to do so. The study was approved by the ethics committee of the relevant college.

Data Analysis

Data were analyzed inductively, according to Richards (2009). The data retrieved were analyzed in two stages: in the first stage, a preliminary exploratory analysis was conducted, which included reading the transcribed

interviews. Thus, a preliminary impression was formed and major themes were explored, taking into account possible organizational frameworks as well as the possibility that additional data might be needed. In the second stage, the interview transcripts were coded, so as to reveal major categories and subcategories or domains (Creswell, 2005).

Results

The interviews conducted with third-year student-teachers after they went back and reread the blog posts that they had written in their freshman year revealed three major ways in which the blog writing assignment had affected the teacher-education process, according to their retrospective views. Specifically, these participants found that the blog writing assignment was effective for the purposes of reflection, developing writing skills, and peer learning and sharing.

Reflection

Twelve of the 14 participants noted retrospectively that the blog provided a platform that helped advance their reflective and writing abilities. They especially emphasized that in the first year of their program, writing blog posts was a new and challenging type of assignment, one that they often times resented. However, in retrospect, they considered their reflective writing in the blog as an important basis for their current state of professional development.

Thanks to the reflective writing I did on the blog, I was able to gain important insights regarding my experience and my educational views, which were further developed and formed through the years. [of the program]. Although the reflective process was challenging at first, it soon became part of the routine, and helped me develop metacognitive reflection skills. At this point in time, I can clearly state that reflective analysis is an inseparable part of my experience and contributes to my ability to learn from experience, gain insights for future reference, and to pinpoint important issues that I wish to improve on or maintain. Most of all, it enables me to consider many aspects simultaneously.

Similarly, others noted, "Returning to the blog led me to understand the extent to which reflection was central to my learning and influenced my development process in a positive and significant manner;" and "The first-year blogging assignment served as a basis for the process I underwent. I think it was important in terms of reflective analysis, because by setting a firm basis, I was able to take it forward."

One of the participants described the link between the blogging activity and the development of her reflective abilities:

I believe that reporting my thoughts through the blog helped me learn to express myself and formulate my thoughts intuitively, to process my feelings and the difficulties I encountered in various situations. Afterwards, I was able to think over the insights I had gained, consider alternatives, and suggest steps and changes. I think that the blog helped me develop my reflective abilities.

It appears that for the majority of the participants, the blogging was recognized as a significant tool for advancing reflective assessment skills. This finding coincides with those of other previous studies, which found that integrating blog writing in the course of teacher education can help develop reflective analysis (Deng & Yuen, 2011; Harland & Wondra, 2011).

Writing Skills

Twelve of the 14 participants noted retrospectively that the blogging assignment contributed to their motivation to write. On the one hand, this motivation was associated with the external aspect of a required assignment that formed part of the practicum: "In the first year, I found it difficult to write, but I knew I had to write blog posts as it was a requirement during the practicum." On the other hand, the motivation came from an inner source, such as the need for self-expression: "The blog motivated me to write because it enabled me to express myself in a manner that I chose and not in a prescribed way." Another participant noted, "I felt that the blog provided a format in which I could express my thoughts and feelings without holding back, knowing that whoever would read my posts would not be looking to critique them."

Some of the participants noted that the blog helped improve their writing skills; they associated this improvement with the fact that the writing was meant to address a familiar audience:

My writing skills improved significantly because of the blog. I reread my blog posts from the beginning of the first year and was amazed to find a poor vocabulary, spelling mistakes, and lack of proper punctuation, all of which posed a sharp contrast to my writing skills nowadays. I knew from the start that I would have to improve my writing and I knew I didn't want to feel embarrassed to let others read my posts.

Five of the participants claimed that that the blog writing assignment also helped them improve their academic writing skills, used in essays and assignments, and they associated this process with the development of language skills in general, which is an integral part of studying in an academic institution. "The more I wrote in the blog, the more my wording and language improved significantly. This, in and of itself, helped develop my academic writing skills and my ability to write academic papers in my various courses." These findings coincide with those of previous studies,

which found that blogging helps promote writing skills among students in a teacher-education program (Biberman-Shalev, 2018; Kosnik et al., 2016).

Peer Learning and Sharing

Seven of the 14 participants noted retrospectively that for them the blog highlighted the importance of sharing as a preliminary step to peer learning. Thus, for example, "Through the blog. I learned the value of peer learning. Reading each other's blogs enabled us to open up to new ideas that we could try in the course of the practicum."

Everything that was posted to the blogs helped form our opinions, thoughts, and educational perceptions. This is one of the things that was very useful about the blog writing, especially if you felt stuck and needed a fresh idea for your lesson.

One of the student-teachers claimed that the blog was useful for peer learning, because it led her to understand that any event that took place in the course of the practicum could be examined from various points of view.

Sometimes, when I read a post written by someone else, I found that she had a different view of a particular event from our practicum and so she drew different conclusions. Sometimes reading such posts even changed my own perception of what had happened.

This finding is related to those of several studies that found that integrating blog writing in the teacher-education program helps promote a supportive learning community and creates a safe space for sharing knowledge and information (Duarte, 2015; Tang & Lam, 2014).

Discussion and Conclusion

The use of blogs as part of the teacher-education process has been one of the foci of recent empiric studies which seek to improve the training process and adapt it to 21st century requirements. In this context, the current study aimed to examine retrospectively the effectiveness of the blogging activity assigned to student-teachers in their first year of the program, in an effort to gain an in-depth understanding of its long-term impact on participants in the teacher-education program.

The findings of the study revealed student-teachers' retrospective perceptions of the type of impact that the blogging activity had on them, in the context of their training program, i.e., reflection, writing, and peer learning and sharing. The most frequently mentioned category was that of reflection. Upon returning to their blogs, participants were able to recognize that in their first year, they had not adequately understood the importance of reflection as a teaching practice; in fact, they had perceived it as an unnecessary burden. From the vantage point of a later point in their

studies, they were able not only to identify the importance of this practice, but also to recognize that the blogging exercise assigned in their first year constituted a structural basis for developing and advancing this practice as part of their professional activity.

Some of the participants retrospectively perceived the blog was an activity that promoted the quality of their writing skills in general. Advancing writing skills is also related to external motivation, given that the blogging was a required assignment and that the posts were read by the pedagogic counselor and by peers. Furthermore, the writing was perceived also as an internal motivation, driven by the desire to express oneself and air the emotions that surfaced in the course of the practicum. These findings coincide with those of previous studies (Deng & Yuen, 2011; Kosnik et al., 2016).

Another major aspect of the value of blogging as perceived retrospectively was the opportunity to learn and share with one's peers. Approximately half of the participants recognized retrospectively that the blogging activity led them to understand the importance of peer learning, and the advantages of sharing knowledge and information (Duarte, 2015; Morgan, 2015).

In summary, observing these findings and the vantage point provided by hindsight, it is possible to cautiously claim that a blogging activity that accompanies student-teachers' first year of practicum may serve as the basis for inculcating reflective thinking and writing and advancing writing skills in general. The implications of this conclusion are that blog**s** can have a long-term and valuable impact on the students in the teacher-education program. Another advantage of the blogging activity is that it enables student-teachers to experience first-hand the benefits of peer learning and sharing, which is brought into play when the exercising of certain skills takes place in cyberspace. These conclusions emphasize the important role of teacher educators**.** Teacher educators who integrate blogs during the first year of the program may provide a platform that helps establish a basis for practicing and improving both reflective practices and writing skills, which in turn leads students to understand the importance of reflection as an essential tool, practice their academic writing skills, and internalize the significance of peer learning and sharing.

It should be noted that the current study is not without limitations. First, the number of participants was relatively small and all participants were women. Second, it is possible that the participants' prior relationship with the researcher influenced their responses, despite the efforts to design the study in a manner that avoids such bias. Future studies could examine the impact of returning to the blog within shorter time intervals, for example, at the end of the first year of the teacher-education program, and then compare the impact of this retrospective activity at various stages.

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TEACHER'S MOTIVATION FOR MASTER DEGREE PROGRAM IN EDUCATIONAL SCIENCES IN LATVIA

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ABSTRACT

Since October 2018 the University of Latvia alongside with three other higher education institutions (University of Liepaja, University of Daugavpils and Rēzekne Academy of Technologies) have been involved in the European Social Fund project 8.2.1 which aims to reduce the fragmentation of study programs in the field of education, pedagogy and sports in Latvia by closing a number of existing programs and developing new programs to provide conceptually new development of teacher-oriented teacher education in Latvia. As a part of the project the new Master level program "Educational sciences" being developed. The study aims identify teachers' motivations to study in the Master level program "Educational sciences". The study' s methodology included examining data both from interviews with the heads/ or deputies of the eight mainstream schools (different regions and types of schools), recent teachers with a Master's degree in general education, and surveys administered for educators and the students from bachelor level teacher education programs. As results indicate that the motivation of teachers to study in the Master level program is primarily intrinsic one which is consistent with international research. However, it would significantly facilitate studies if opportunities were provided to study for the state funded resources. Teachers extrinsic motivation to study the Master's level program in the education is closely associated with existing political, socio-economic, cultural and educational characteristics of Latvia's current state and demands from society.

Keywords: Master of Educational sciences, Teacher motivation, Future professional development.

Introduction

Since October 2018, the University of Latvia alongside with three other Higher Education institutions (University of Liepaja, University of Daugavpils and Rezekne Academy of Technologies) have been involved in the European Social Fund project 8.2.1. The project aims to reduce the fragmentation of the higher education study programs in the field of

education, pedagogy and sports in Latvia, by closing a number of existing programs and developing conceptually new programs. Particularly, there will be closed 7 Master level programs during period of 2021–2023 at the faculty of Education, Psychology and Art at University of Latvia and instead of them there will be developed two new Master level programs. One of those Master level programs is "Educational sciences", whose primary target audience are teachers. The Program development began in October 2018 and continues until September 2019.

The new program development always has been influenced by many stakeholders, internally and externally. It is a pressure from society for the Master programme in education to contribute both to the qualification of individual participants and to promote changes in the current school culture and structure. The society hopes that those who complete the Master level course will become "change makers in the school". As we know from the research (Snoek, Enthoven, Kessels, Volman, 2017) it is possible to connect professional development of teachers in the Master level program and school development at the same time. The society has high demands on qualified teachers. The new standard based reforms in Latvia influences it particularly. There is a new demand for teacher professional development as means to enable them to reflect on and critique their own performances, create their own knowledge and attain professional autonomy the same time. Thus, designing the academic Master level education programs, especially for teachers, has high complexity. The Master program for teachers is not a straight forward knowledge transformation. Those programs should be teacher oriented and focused, they have to answer to the learners needs and to be based on teachers current experiences, also should take in consideration the current school' s as organization's needs as well.

What is known from the research that the motivation of teachers to participate in programs is an essential element that should be taken into consideration when planning the Master level continuing professional developing/professional learning program (Beresford-Dey, Holme, 2018).

A review of theoretical literature reveals that studies related to students' motivations for attending a specific programme have been conducted for many years, yet there is no extensive research on motivation to study in the Master's level programs (Bozek, B., Raeymaeckers, Spooren, 2017), even less on teachers' motivation to study at Master's level programs in educational sciences.

The latest research that have been conducted internationally, for example, the research in Vietnam (Nghia, 2018) reveals 14 motivations to study in the Master level programs in education. The results of the study show that students choose to study the Master level programme due to

their passion for learning, the need to acquire knowledge and skills relevant to their targeted/current job, or to challenge their academic competence. They were strongly motivated to attend the Master's programmes also due to employment-related motivations, such as finding a well-paid job, meeting employers' demands for postgraduate qualifications, to get a promotion at their future work, or to continue to be competitive in the labour market. In the research conducted by Israeli scientists (Arar, et al., 2018) there were found that the highest rankings motivation was found for teacher's self-development, but the next highest ranking was given requirements such as the desire for a higher salary, or motivation induced by pressure from their work places and surroundings. The comparative study for three post-soviet countries – Romania, Poland and Latvia was conducted to find out the motives of student teachers to study in Master' s program. (Kowalczuk-Walędziak, et al., 2017) The main motives expressed by the student teachers were to gain deeper knowledge and skills in the field of education, along with enhancing personal development and professional development.

The results provide an understanding that the research can be explained by self –determination theory. The authors Edvard Deci and Richard Rayens argue that people have intrinsic desire to explore themselves, understand and assimilate aspects of their environment. This proactive motivation is present from the very early stages of development, does not depend on external pressures. «People are said to be motivated to the extent that they intend to accomplish something" – that is, to the extent that they have a purpose» (Deci, Ryan, 1994, p. 3). Intrinsic motivation helps the natural human propensity to learn and assimilate (Ryan, Deci, 2000). Intrinsic motivation results in high-quality learning and creativity. Therefore, intrinsic motivation for learning would always be the most important. At the same time extrinsic motivation which can reflect external control or true self-regulation are important for learning too. As it was concluded by both authors after their empirical research that both – intrinsic and extrinsic motivation are important for optimal learning (Deci, Ryan, 1994). As found in studies (Nghia, 2018, Arar, et al., 2018), teachers' motivation to study in the Master's program is primarily intrinsic, but the importance of external motivation should not be underestimated.

So far there has been published comparative study examining Polish, Romanian and Latvia's student teacher's perspective to study in Master level programs (Kowalczuk-Walędziak, et al., 2017). The part of the mentioned research questioner was devoted to motives for choosing master's program. But there have been not published research specifically concerning teacher's motivation to study in Master level program in Latvia, therefore understanding teachers' study motivations in Master level program can be used as a guide to develop the teacher centred master level programme.

The aim of the article is to identify the teachers' motivations to study in Master level program "Educational sciences".

The researchers explore the motivation (intrinsic and extrinsic) of teachers to study in the Master's programs in education science and provide suggestions to be taken into account by designing the comprehensive Master level program from that.

Methodology

The study was conducted as a mixed method case study. It took place in Latvia from 2018, October to 2019, May, alongside the development of the Master level program "Educational sciences" in the University of Latvia. At first phase it included 14 semi structured interviews with the heads or deputy-heads of 8 mainstream schools (different regions and types of schools) and 2 teachers recently obtained the Master's degree. There were studied "School quality indicators" (233) alongside. After analyses of theoretical literature and acquired results in the first phase (results from semi structured interview and analyses of "School quality indicators") there were developed a questioner (see Figure 1) and organized a survey (N = 186) administered for educators and the students from bachelor level teacher education programs.
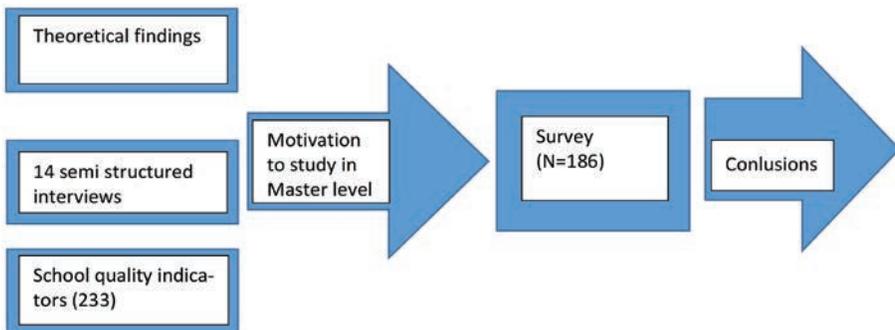

Figure 1. Research design

The survey included 33 questions. In this paper there are analysed four questions related to teacher motivation to study in the Master level program. The survey was designed in Google platform and was distributed online through several channels – emails, Facebook, WhatsApp. The University of Latvia and the project partners participated in the distribution of survey. There were set time limits (three weeks) for distribution and data collection of the survey. After receiving the data there were used descriptive statistical data processing method and descriptive analyses.

Participants of survey. Majority of survey's respondents were in at the age from 25 up to 50 years old (together 65,4%), which is the main target audience's age for the Master level studies. Majority of respondents have a working experience from 5 years up to 20 years at school (See Figure 2).
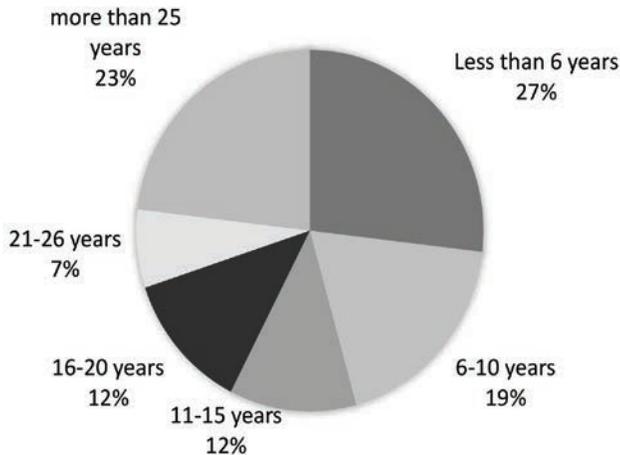

Figure 2. Respondents' current work experience in the education

The main part of the respondents are employed in the primary (34,4%) or in the secondary school (21,5%).

41,4% of respondents admitted that they are interested to study in the Master's level program, only 8,6% of respondents responded that they are not interested for future studies in the Master's level programs. 37,6% of respondents answered, that they already have Master degree. The data reveals that most of the teachers who do not have the Master's level education are interested for their further studies.

Results

Results of the 1st phase

The researchers started by studying externally formulated quality indicators according to which the quality of every educational institution in Latvia is described and evaluated (SEQS/IKVD, n.n.). Analysis of 233 indicators applied for evaluation of schools in Latvia shows that 69 (about 20%) of them are related to the competencies that are specific to the Master's level education, other 80% – to teachers' professional competencies or their management skills. The Figure 3 illustrates the proportion of the key areas (number of indicators) whose quality is

determined by the professional competence at the Master's level and justifies the conclusion that the areas in which education the Master's competencies are most needed are process analysis, evidence-based institution development planning, as well as expertise and mastery in methodological leadership.
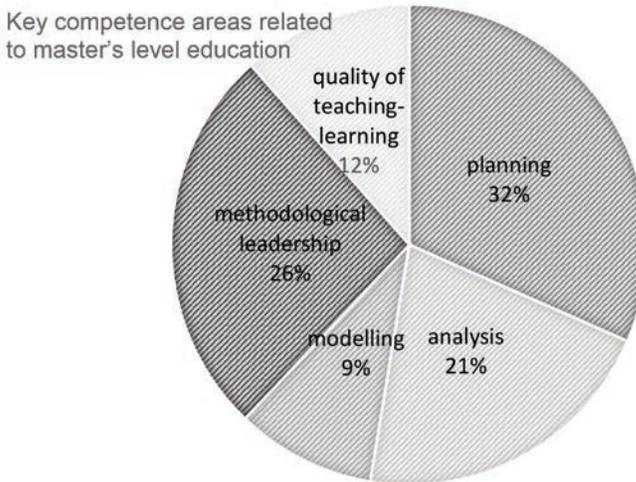

Figure 3. Formal quality indicators related to Master studies

The results of conducted semi structured interviews revealed that the Master's degree at school is not required neither by the profession standard, nor it affects directly the teacher's financial conditions. The Master's level education is not required by regulation or any external conditions. However, taking into account the demands of modern education – moving towards competence approach and increasing an autonomy of the schools, managing modern educational processes and implementing inclusive education – the Master's level competencies for teachers and educators in general education have become crucial to ensure the evidence-based quality education, innovation and school development in the changing contexts. There are clearly required such competences as: process planning, evaluation, forecasting; methodological leadership; ability to act / think / plan / analyse interdisciplinary; ability to analyse the effectiveness of educational processes; evidence-based development planning (including ability to contextualize and use the results of current research in the field); 'big picture' thinking in education. The key-term of the Master's level education should be internal discipline. Taking into account the direction of education policy to competencies based education, education institutions demand change agents understanding and learning the essence of actual education changes as well as implementing them

in real contexts (considering the lack of educators, aging, technological possibilities, etc.), fostering internal discipline by working in teams, especially concerning inclusive education, which is actual for education policy in Latvia and requires effective collaboration of the whole school personnel.

Thus, despite the real (pragmatic considerations) situation in educational institutions to implement reform plans, educators have the opportunity to improve their academic and professional potential in the Master's level programs. It is also related to the provision of pedagogical professional development opportunities, which, in parallel with the broad offer of further education courses and regulations for the further education of teachers, provide an opportunity to significantly increase the qualification of educators, directs to higher academic / professional level activities and purposefully prepares specialists for work in uncertain situations that are topical for education reforms (can generate new ideas, evaluate their implementation risks, use methodologically sound reasoning, evaluating situations / results / opportunities).

Results of the 2ⁿᵈ phase

After the conducted or provided analyses of formal quality indicators and semi structured interviews results, taking into consideration literature review, there was made a set of 23 motivations for teachers to study in the Master's level programs. The possibility to add teachers own motivation to the list was provided. There were both intrinsic and extrinsic motives included in the list. Intrinsic motives: self-realization, to get broader picture an overview and an interdisciplinary view of what is going on in education, to develop pedagogical competencies, to develop leader competencies, to develop researcher competencies, to participate in the planning and implementation of educational processes in an educational institution, evaluation, forecasting skills; to make evidence based analyses of processes at school, to undertake methodological leadership in the school, to become a change leader in education, to spend purposefully the free time, to implement the research projects of interest, to have an opportunity to learn in the Master's level program, to achieve the high quality professional development in the area of interest, to acquire the Master's level education for future studies in Doctoral program, to be ready to start up own business. The extrinsic motives: to have a higher salary, to keep job, to raise status in education institution, to climb the career ladder, to belong to educational institution, as the work in that institution demands a higher level education, to lead a projects, to became a director of the educational institution, to have an opportunity to go abroad for exchange programs. There were no any other motives added from participants to the list.

Accordingly, the major question to teachers was about their motivation to study in the Master's program "Educational sciences". The survey revealed that the 8 highest ranking of respondents motivation for Master studies in education were: deliberately improve pedagogical competences (47,8%) to get broader picture an overview and an interdisciplinary view of what is going on in education (35,5%), to participate in the planning and implementation of educational processes in school (22,6%), to improve management/leadership competencies (21,5%), to become the leader for change in the education (15,1%), to achieve the high quality professional development in the area of interest (15,1%), to make an evidence based analyses of existing processes at school (15,1%), to develop researcher competence (15,1%). The all above mentioned motives are intrinsic ones. The 8 lowest ranking of respondent's motivation for the Master's studies in education were: to keep their own job (2,2%) and to have an opportunity to go abroad for exchange programs (2,7%), to raise their own status in the education institution (3,2%), to spend purposefully the free time (4,3%), to have a higher salary (5,9%), to climb the career ladder (5,9%), to lead projects (5,9%), to belong to educational institution, as the work in that institution demands the higher level education (6,5%). Seven of the 8 lowest ranking motives were connected with extrinsic motivation. The results obtained may be explained by the respondents' answer to the next question: whether the teachers were encouraged and motivated to study to the Master's program by the educational institutions in which they work currently. In response to that 29,6% teachers agreed that they were encouraged and motivated to study in the Master's level program, but 35,5% admitted that they were not motivated by the institution they work for. The other question was asked to teachers: under which conditions teachers would be willing to study for a Master's degree? The 5 highest ranking answers were: if the studies were interesting and attractive (51,6%), if there would be a possibility to study for the state budget funds (50,5%), if it would be possible to solve the existing work problem during the studies (25,3%), if there would be a part time studies (25,3%), if the studies would be on Fridays and Saturdays (24,7), if it would affect my salary (22%). The answers provided by teachers still highlight the fact that for intrinsic motives there is high importance, as respondents are willing to have interesting and attractive studies. Nevertheless, the possibility for students to study for the state funded is not less important. It can influence the teacher's decision to study in the Master's level program.

Conclusions and Implications

Recognizing the limitations of this study, the case study indicates that the motivation of teachers in Latvia to study the Master's level program is primarily intrinsic one which is consistent with international research (Nghia, 2018, Arar, et al., 2018, Kowalczuk-Walędziak, et al., 2017). Out of the 23 motivations for teachers to study in the Master's level programs there were identified the 8 as most important ones: deliberately improve pedagogical competences, to get broader picture an overview and an interdisciplinary view of what is going on in education, to participate in the planning and implementation of educational processes in school, to improve management/leadership competences, to become the leader of change in the education, to achieve the high quality professional development in the area of interest, to make an evidence based analyses of the current processes at school, to develop their researcher competence. The results of the survey pointed out that external motivation was the least important for teachers. To keep job, to have an opportunity to go abroad for exchange programs, to raise status in education institution where they are employed, to have a higher salary, to climb the career ladder was the least important motivation for teachers to study in the Master's program. As it was explained by respondents of semi structured interviews the Master's degree is not required neither by the profession standard, nor it affect in any way the teacher's financial conditions. Only fourth part of the respondents agreed that they were encouraged and motivated to study Master's program by the educational institutions in which they work. If compare it with international studies (Nghia, 2018, Arar, et al., 2018) in other countries teachers have given greater importance to external motives than in Latvia. Consequently, we can conclude that the teacher's extrinsic motivation to study the Master's level program in the education is closely associated with existing political, socio-economic, cultural and educational characteristics of Latvia's current state and demands from society.

Although the intrinsic motivation is the most important for teachers to study the Master's level programs in Latvia the designers and supporters of the program should be considering that half of the respondents agreed that the studies should be interesting and attractive and there should be a possibility to study using the state budget funds for this purpose. Many teachers would be interested to solve the existing work problem during the studies. Almost fourth part of the respondents would be interested in the part time studies and to have lessons on Fridays and Saturdays. Only the fifth part of the teachers admitted that they would be interested to study if the studies affect their salary. So we can conclude that the motivation of teachers to study in the Master's level program is primarily intrinsic one but

opportunity to study using the state budget resources would significantly increase respondents' interest for studies.

According to the results the Master's program "Education Science" is developed by taking into consideration the program objectives, by clarification the concept of the program, content and possible forms of studies.

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PROFESSIONAL MASTERY OF ACADEMICS IN HIGHER EDUCATION: THE CASE OF LATVIA

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ABSTRACT

The whole higher education (HE) teaching and learning environment nowadays is formed by similar phenomena: greater, more ambitious and diverse student structure, high quality demands, rapidly changing technological opportunities, higher hopes from government, students and employers that the graduates will be prepared for quickly changing workplaces. Changes and uncertainty in the world are unceasing topics of discussion and research in any industry. Preparing students to live in today's uncertain world is an important task for universities. In the context of a suitable study process development, at the moment study programmes and study courses in HE institutions in Latvia are being reorganised, new demands are being defined for academic staff, extensive evaluation of study process and involved participants is being carried out, including one of the common practices in HE institutions – student surveys. The obtained results are being used not only in quality assurance for quality control but also to establish the necessary improvements and continuous development of studies. Yet, more and more frequently employers state that graduates are not sufficiently prepared for the changing and uncertain world and professional life. Why? As the 'world of work' has also advanced, the changes in HE institutions are not always being implemented according to the dynamic demands of the industries. The implementation of changes brings about not only a shift in organisation of HE institution performance but also changes in perception and comprehension of students and academic staff. With the purpose of study process supervision, the opinion of students is identified more frequently than the opinion of academic staff. Therefore, a question about how academic staff of HE institutions implement their professional activity that forms the framework of their professional mastery, becomes topical, because the professional mastery of HE academic staff is a prerequisite for the processes of development of student professional mastery. The way how academic staff of HE institution see themselves as people, as lecturers, is an important aspect of how they implement their professional mastery (Ashwin et al., 2015). This demand formed the research question: what creates the professional mastery framework of a HE lecturer who prepares students for a situation of uncertainty and changes. In order to answer the research question, scientific literature was analysed, a binding framework and reasoned professional academic staff framework

established, the explanations of criteria for professional mastery of the academic staff of HE in day-to-day professional activity were identified.

Keywords. Higher Education, Professional Mastery, Professional Activity.

Introduction

The idea of sustainable development is the primary goal of 21st-century education. Education for sustainable development promotes people's responsibility in everyday life: self-realising in line with the social, cultural, economic and natural environments. Therefore, the aim of education for sustainable development is a person who lives not only in accordance with nature and other cultures but also is able to realise himself fully in the economy and in society as a whole, ensuring the long-term and thoughtful use of resources. Such a person understands local problems and can view them in a global context, understands other cultures with respect. Furthermore, this person is also capable of building healthy relationships of different levels (personal, professional), thus creating a sustainable society and promoting its economic growth. The Sustainable Development Strategy of Latvia until 2030 emphasizes that the quality of education, its availability and content are major challenges for the development of human capital. Higher education is not only a process of acquiring specific competencies and qualifications but also a process of developing human talents, emotional intelligence and personality. The National Development Plan of Latvia for 2014–2020, therefore, identifies "Economic growth" as one of its priorities and "Developed research, innovation and higher education" as one of the actions to achieve it. In order to implement the National Development Plan of Latvia, professional HE institution lecturers, whose professional mastery is one of the prerequisites for the qualitative implementation of the study process and the development of a healthy study environment, are required. An equally important context of the problem to be analysed is that the whole HE teaching and learning environment nowadays is formed by similar phenomena: greater, more ambitious and diverse student structure, high quality demands, rapidly changing technological opportunities, higher hopes from government, students and employers that the graduates will be prepared for quickly changing workplaces. Changes and uncertainty in the world are unceasing topics of discussion and research in any industry. Preparing students to live in today's uncertain world is an important task for universities. Therefore, a question about how academic staff of HE institutions implement their professional activity that forms the framework of their professional mastery, becomes topical, because the professional mastery of HE academic staff is a prerequisite for the processes of

development of student professional mastery. The way how academic staff of HE institutions see themselves as people, as lecturers, is an important aspect of how they implement their professional mastery (Ashwin et al., 2015). Nowadays, the HE lecturer not only prepares the new specialists for the needs of the national economy, but also introduces them to further life-long learning and research activities. Therefore, the content of the social role of lecturers is changing. They become supporters, partners, inspirers and guides in the selection and acquisition of knowledge, in the learning process. Nowadays, the HE lecturers also keep learning, direct their own and students' knowledge, act as entrepreneurs. Scientific knowledge is used in the study process in the development of teaching materials and tools; students engage in scientific research, thereby building and developing their research and professional competencies necessary for the sustainable development of society. The context of HE reforms helps to identify the problem to be analysed in the study: the importance of the professional mastery of a lecturer in building healthy communication in the study process. The subject of the research is the analysis of the professional mastery of lecturers in the provision of sustainable education.

The described situation reveals the research problem on which the research questions are based:

1) what criteria form the framework of the professional mastery of the academic staff?
2) how are the components of the framework of the professional mastery of HE lecturers outlined in the lecturers' interviews?

The Context

A professional is a person who has graduated from an accredited initial training program, including specialized knowledge in accordance with a professional standard, and who is approved as a registered practitioner with the right to express an autonomous professional judgment (Hooley, 2007). Professional mastery is linked to the concept of "a profession and a professional" (Munoz Palm, 2008). The framework of professional mastery consists of (1) competence in the field of specialization, (2) moral integrity (values) and (3) didactic competence (Carr, 2000; Shon, 2006). This framework acts as a foundation for all professionals and is useful for achieving the objectives of professional communities. This content of the framework of professional mastery is therefore also relevant to the professional mastery of the HE lecturer. Law (the Law on Institutions of Higher Education of the Republic of Latvia, LV § Section 27, 1995) states that the academic staff of an institution of higher education shall conduct scientific research and participate in the educating of students.

Professional mastery also includes focusing on pedagogical work, becoming a competent professional in one's field, respecting professional ethics, maintaining a healthy emotional climate in higher education institutions and the professional identity of university lecturers (Commonwealth Secretariat, 2012). In the context of professional mastery, Archer (2000) emphasizes the importance of a sense of belonging; a sense of belonging is exercised through "internal conversation", through an activity she calls "reflection" It can, therefore, be concluded that the professional mastery framework of HE lecturers consists of the following dimensions: pedagogical (didactic), occupational (the sector in which the lecturer is teaching) and research-related. Scientists agree that professional mastery is closely related to professional identity (Marcelo, 2009). Through professional identity, HE institution lecturers perceive themselves and form their own professional mastery on the basis of self-perception. Professional identity is the function of HE institution lecturers to define themselves and others (Marcelo, 2009). Continuous professional development is a necessary condition for the professional mastery of HE institution lecturers. Similarly, the available literature reaffirms the importance of professional identity in strengthening quality in the education sector. The quality of higher education refers to effective teaching and learning resulting from suitable resources, including the professional mastery of university teachers (Okebuka, Shabani, 2007). Through the analysis of the scientific literature, it can be concluded that there is no common view on what constitutes the professional framework of a HE institution lecturer, therefore, an empirical study was carried out in order to identify the components of professional mastery of a HE institution lecturer in the context of Latvia.

Methodology and Process

The study was carried out in a qualitative approach, using the content analysis of interviews with 20 lecturers from different Latvian higher education institutions, which allows to analytically and descriptively compare the thematic diversity expressed in the narratives of interviews with the views identified in pedagogical literature and other secondary sources. For linguistic analysis of the narrative content of HE institution lecturers, primary content association-raising basic factors – the personality characteristics of HE institution lecturers – were selected. In the secondary selection, the names of the respective actors and their activities with identical and close meaning were identified – forms of a word in various tenses or conjugations, singular and plural forms, diminutives, which characterize the social roles and functions of the basic actors. The social roles and functions of the basic actors were analysed according to the dimensions

identified in the theoretical findings: pedagogical, occupational (the sector in which the lecturer is teaching) and research-related.

According to the amount of data to be processed, the linguistic analysis of HE institution lecturer interviews was carried out during the first level of empirical analysis using the QSR NVivo 12 Quality data processing programme; the identified content units were analysed manually. The choice of a computer program was determined by functional advantages: (1) it offers to automate the analysis of the original primary data array and manually adjust it to the content at later levels of analysis. It makes it easy to collect and systematize qualitative data; to identify frequently used words, the context of their use and meanings by carrying out simple concessional analysis; (2) it provides an opportunity to automatically filter large-scale data accurately in a short time across different cross-sections and contexts, thereby significantly accelerating their analysis and increasing the level of its objectivity. (3) A computer program consecutively retains historical commands, allowing the researcher to manage the course of coding and analysis in a meaningful way (Bryman, 2016; Bazeley, Jackson, 2013).

Data processing and analysis were implemented on several levels: (1) the content units of interviews were imported into the NVivo file, technically edited and sequentially coded, with the frequency initially set at 3,000-words; then, based on their weighted rate of frequency, 184 identified and selected, and of those, 15 basic keywords (codes) which characterise the professional mastery of a HE institution lecturer; (2) hierarchical coding-grouping was implemented to identify mutually thematically related keywords and groups, their frequency of use and contextual meanings, that reveal the essence of the research focus "the professional mastery of a HE institution lecturer"; (3) based on the code structure created through content analysis, the framework of the professional mastery of a HE institution lecturer was created, designed for planning, promoting and supporting personal, professional and career development goals in higher education.

Results

Gender distribution of respondents: female (n = 15) and male (n = 5), their age varies from 30 to 56 years. The most frequently used words in the interviews are shown in Table 3.1; they were analysed by frequency, namely, numerical values: the frequency of each code (number showing how often it is referred to in the text) and the weighted percentage of the word indicating the frequency of the code in the total text volume. The interview codes used in the interviews were analysed interrelatedly by using content analysis and context analysis.

Table 1. The Most Frequently Identified Words in Interviews

Word	Count	Weighted Percentage (%)
self-reflection	40	14.63
healthy self-esteem	37	13.17
health and safety	35	12.12
perseverance	30	11.63
learning skills	30	11.63
discussions	27	11.36
responsibility	25	11.08
enthusiasm	24	8.66
humour	24	8.66
assessment skills	19	8.38
equality	18	8.24
information literacy	17	7.96
ability to regulate emotions	16	7.78
motives for choosing a profession	15	7.77
attitudes towards innovation	15	7.77
prioritization	28	7.59
analysis	28	7.59
creativity	28	7.59
to feel in harmony	27	7.58
belief in oneself	25	7.00
to feel interested	23	6.91
return	19	6.86
time management	19	6.86
satisfaction	18	6.57
respect	17	6.47
reaction to change	16	5.78
knowledge	16	5.78
positive self-image	15	5.65
continuous professional development	14	5.42
self-organization	14	5.42
preparation	14	5.42
work-life balance	14	5.42
resources	12	4.26
critical thinking	11	3.97
infrastructure	9	3.83
cooperation	10	3.61
problem-solving skills	10	3.61
language skills	10	3.61

Through analysis of the results obtained (Table 1), it can be concluded that the most frequently used words in the interviews of the HE institution lecturers reflect that, in the content of their professional mastery, personality traits of the lecturers, as well as functions (activities) and skills are included. The most commonly used words illustrate the professional mastery of HE institution lecturers as a self-reflective, dynamic and goal-oriented part of their personalities. In order to determine the framework of professional mastery of university lecturers, in the program actions were taken to identify the most frequent interrelations between commonly used words, and a scheme was created that reflects their interconnectedness in thematic blocks (their order based on subordination). Data analysis points to three blocks of word interrelation: personal efficiency, knowledge, and emotional satisfaction, where the order of words indicates the complexity of the relationship between them. For the sake of visualisation, the programme scheme has been manually narrowed to three interrelation blocks (Table 2).

Table 2. Breakdown of the Most Frequent Interrelations Between Words. Personal Effectiveness

Word	Association	Sub-block
personal effectiveness	prioritization humour preparation perseverance time management enthusiasm motives for choosing a profession	return
	reaction to change self-organization self-reflection responsibility	work-life balance
	belief in oneself problem-solving skills respect ability to regulate emotions healthy self-esteem	positive self-image

The first word interrelation block is based on the word personal effectiveness (Table 3), which is composed of three sub-blocks: return, work-life balance and positive self-image. The word *return* is related to the words: motives for choosing a profession, enthusiasm, prioritization,

humour, preparation, perseverance and time management skill. The combination of words *work-life balance* is related to words: reaction to change, self-organization, self-reflection and responsibility. The words ability to regulate emotions, belief in oneself, problem-solving skills, respect and healthy self-esteem are associated with the word combination *positive self-image*.

Table 3. Breakdown of the Most Frequent Interrelations Between Words. Knowledge

Word	Association	Sub-block
knowledge	analysis learning skills critical thinking	language skills
	problem-solving skills creativity attitude to innovation assessment skills	information literacy

The word block of words is composed of the word knowledge (Table 4), which consists of two sub-blocks: language skills and information literacy. Composition of the words *language skills* is related to the words: analysis, earning skills, critical thinking. Composition of the words *information literacy* involves words: problem-solving skills, creativity, attitude to innovation and assessment skills.

Table 4. Breakdown of the Most Frequent Interrelations Between Words. Emotional Satisfaction

Word	Association	Sub-block
satisfaction	resources health and safety responsibility	infrastructure
	continuous professional development discussions respect to feel interested to feel in harmony equality ability to regulate emotions	cooperation

The third word block consists of the word satisfaction (Table 4), which consists of two sub-blocks: infrastructure and cooperation. The word infrastructure is associated with the words: resources, health and safety, responsibility. Word cooperation is related to words: continuous professional development, discussions, respect, to feel interested, to feel in harmony, equality and ability to regulate emotions.

Discussion

When analysing the results of the study, the research questions of the study can be answered: all the dimensions of professional mastery of the higher education institution lecturers identified in theories are outlined in the interview content topics. The results suggest that HE institution lecturers do not implement their professional mastery based on the model they have witnessed, observed and acknowledged as appropriate, but consciously develop their professional mastery as part of their personality. It can be concluded that the most frequently used words in HE lecturer interviews reflect the framework of professional mastery, and it consists of personality traits as well as functions (activities) and skills. Thus, a framework of professional craftsmanship can be created with facets of personal efficiency, knowledge and satisfaction. Satisfaction encompasses both infrastructure and cooperation aspects, so it can be concluded that this block is at the core of the learning process shift, from the subject's position, into an open communicative space: the circulation of ideas, approbation and joint evaluation. Knowledge is related to the lecturer's skills to acquire the necessary information of varied content and nature, to navigate through it and to use the information in such a way that the added value of knowledge is created. The obtained results confirm nowadays that acquisition of new knowledge is closely related to information management, promoting the necessity of lifelong learning. The self-efficiency block, on the other hand, includes how the HE institution lecturers perceive themselves, feel and behave, what attitudes towards the new they develop. The self-efficiency block includes indicators that characterize personality traits and skills to manage different situations. It can be concluded that the idea of learning through teaching is the basis of the professional mastery framework of the lecturers.

This study can be considered as a pilot study for further research, as the study had a number of limitations: a small number of respondents and interviews were conducted only in the HE institutions located in the capital. In order to gain a deeper understanding of the professional mastery of HE institution lecturers, the study could be continued by exploring the in-depth content of each facet as well as by continuing to

increase their number. Therefore, in assessing further aspects of the HE institution lecturer's professional mastery discourse study, they could be subject to the conclusion of historian Victoria Harris, that, in the future, succession should be enriched, not by studying discourses, because they reveal categories, and the categories are flowing and relative, but through focusing research on specific experiences (Harris, 2010).

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THE FEATURES AND TYPES OF UNIVERSITY STUDENTS' FROM THE VIEWPOINT OF TEACHERS

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ABSTRACT

Higher education is struggling with the consequences of "mass production" that has become characteristic in recent decades. The challenges include large group sizes, impersonal teacher-student relationships, an increase in the number of students with specific learning difficulties. Our research and development project (EFOP-3.6.1-16-2016-00012) aims to help teachers in economics programmes in the formation of attitudes supportive of students and in the development of the efficiency of teaching.

We intended to explore teachers' perceptions of the students, with special attention to their motivation and the characteristics of the learning. We were curious whether teachers identify various student types, and if they take into consideration them in their teaching activities. (We asked students to provide self-characterisations along the above mentioned factors in order to make a comparison between the teachers' and the students' perspectives possible.)

We surveyed teachers of six Hungarian universities. The questionnaire was completed by 210 university teachers. We also supplemented the above with the qualitative analysis of 42 in-depth interviews conducted with teachers.

Almost all teachers agreed that there is a perceptible increase in the differences between students. The teachers' responses outlined a few student types, as well as some typical attitudes in reaction.

While the majority of the teachers approach the experienced phenomena as a challenge, or at least as a task to tackle, and are therefore actively looking for solutions, a smaller proportion considered them as unsolvable problems, and therefore do not even experiment with solutions.

The interviews with the teachers shed light on the significant differences in terms of how nuanced the teachers' images of students are. We incorporate our findings into trainings for teachers.

Keywords: university students, university teachers, motivation, learning, student characteristics, higher education of economics.

Introduction

The stakeholders of Hungarian higher education are dissatisfied. One of the consequences of the series of reforms over the past three decades is "mass production," as a result of which the composition of the student population has changed significantly: it has become more diversified, and differences between students increased.

Prestigious and famous universities pick out the best, highly motivated students. Younger universities, most of which were originally colleges, enrol a large number of less motivated students with average academic performance in order to obtain or keep state financing.

As a result, teachers at universities encounter lower levels of preparation and motivation on the part of the students, while in connection with themselves they feel that they are not adequately prepared to handle the diversity and the large number of students.

When we ask students, however, it turns out that, from their point of view, the low motivation is, to a large extent, the consequence of the teachers' attitudes and obsolete teaching methods. (Fűzi, 2019)

As such, the two sides are blaming each other. The problem is well manifested by the fact that, in addition to the large drop-out rate, the enthusiasm of students remaining in the programmes also significantly decreases over time (Solt, 2018).

Our university is currently striving to address this phenomenon in two ways. On the one hand, it offers special remedial courses and other forms of support to students. On the other hand, it is engaged in a wide-scale research project among teachers and students on the topics of motivation, the use of ICT tools, as well as the application and experiencing of teaching methods, the results of which are channelled into teacher training courses and publications on teaching methodology. Our paper presents a segment of this research project.

Approach and background

Results related to Hungarian higher education

Briefly, we wish to mention the Hungarian problems concerning higher education, which also occur in other institutions of the European Higher Education Area.

The accelerated technical, economic, social and value changes that started in the 20th century did not leave higher education untouched either. In connection with the enrolment expansion, Hrubos (2014, 541) underlines that the massified higher education is not sustainable in the manner used

before this expansion process started. Although the problems are sensed by all stakeholders and there are also efforts for finding solutions, responding to the challenges occurs slower than would be necessary.

Derényi (2018, 133) points out that teachers are faced, on the one hand, with changes in the students, and on the other hand, they experience that their traditional methods are no longer sufficient in teaching students. The composition of the student population also transformed significantly in recent years. The number of students applying and admitted to higher education in the year of their graduation from secondary school has increased (see Figure 1). Due to the decrease of willingness to apply later and of the proportion of those involved in part-time programmes, the average age of freshmen is younger than before. The most talented students try to get into universities in the capital and in other big cities, as well as abroad.
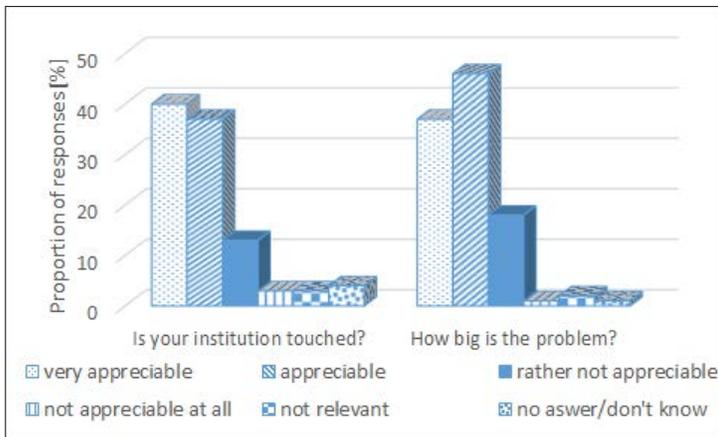

Figure 1. Teachers' perception of the decrease in admitted students' prior knowledge (2014). Source: Derényi, 2018, 142 Based on the data of outstanding project named TÁMOP-4.1.3.

By taking the matriculation examinations, everyone earns the right to enter higher education, which is thus available not only to students in elite education programmes (Kocsis and Koltai 2006, 190, qtd. by Simándi 2016, 18). The student population can be considered as heterogeneous from different points of view: not only in terms of their age, but also their level of prior studies, for example, it is not infrequent to have students working towards their second or third degrees. An increasing number of students also have jobs, which means different work-related experiences on which teachers can build, but there will be also students in the same group who never had a job anywhere before. The so-called non-traditional students also include those who are older, have families, live with disabilities, or

have special education needs (SEN), and teachers are not professionally prepared for these students at all (Kopp, 2013, qtd. by Simándi, 2016, 18). It is not surprising that, in addition to the increasing number of students, the heterogeneity of the groups also makes teachers' work more difficult, as it would necessitate methodological adaptivity and differentiation.

Another factor contributing to the diversity of students is that in the course of their admission procedures – with the exception of a few programmes where aptitude tests have been introduced – there is no screening of students (Derényi, 2018, 134).

Balázs (2014, 551) considers it a legitimate criticism against higher education institutions that, because of the "per capita quota," they admit anyone, which leads to a significant decrease of the quality standards. Students not suited to higher education hinder the learning progress of talented and committed students. They put additional burdens on the teachers, which distracts them from academic and research activities. In his opinion, it cannot be expected from universities to help students who are lagging behind from secondary schools by offering remedial courses.

In recent years, some isolated initiatives, educational innovations have been started, associated with individual subjects, courses, or specific teachers. Some universities strive to offer trainings and other forms of support developing education for its teachers (Derényi, 2018, 139).

Teachers in higher education would be more willing to make efforts for better quality education if they experienced a minimal level of motivation from students for learning. In the different institutions, especially driven by the individual efforts of leaders and teachers, some very promising and interesting innovation processes are being realized, but their maintenance and the dissemination of their effect is unsolved and lacking in resources (Derényi, 2018, 145).

Local and international research concerning changes in higher education and students

Given the large number of international research projects concerning the characteristics and motivations of the current generation of students, the effects of the use of electronic devices, or the methodological development of higher education, we can assume that the phenomenon examined is not a local one. In the following, we will briefly refer to some of these projects that provided ideas for us when designing our own research.

Khalid (2013) conducted interviews with teachers considered by students as excellent and recognized for their work with awards. He tried to identify which classroom activities and teaching styles raise interest among university students. The use of teaching methodological elements

considered effective by the interviewees was also justified by student characteristics and needs. It transpired from the responses that what the majority of students need is not solution of tasks modelling reality, but real tasks, active participation in the processing of the course material, as well as regular and substantive feedback. Further, they are seeking for opportunities for the practical application of the course material.

In her research, Lubicz-Nawrocka (2019) examined the characteristics of what students perceived as excellent teaching. On the basis of her results, it can be concluded that students attribute a key role to teachers in education of outstanding quality. They sense and appreciate teachers' efforts and enthusiasm, as well as their support given to students.

The studies of Vermunt and Minnaert (2003, qtd. by Kálmán) show that the learning style and characteristics of students change a lot over the course of their university years. Further, Vermunt (1996) proved that context also affects the learning behaviour. He found that persons already possessing work experiences, who generally applied the deep-processing learning strategy, start to apply the reproduction-directed strategy once again when they return to formal education settings. It follows from the above that it is difficult to provide a generally valid characterization of students. Therefore, it is advisable to ask teachers to give characterizations of their specific groups in order to find out whether they sense the differences between the different groups and years of students. On the other hand, it is difficult to separate which characteristics are the students' own and which are the elements activated by the environment.

Fábri (2014) examined students preparing to start their studies in higher education and collected their expectations and needs, which are the following:

- the up-to-date nature and applicability of the materials taught;
- the helpfulness of the teachers;
- the quality of the theoretical education and the high standard of the teaching (page 162);
- the relationship between students and teachers in general;
- possibilities for professional scholarships, talent management (page 233).

Magyari (2010) is of the opinion that the negative experiences of teachers regarding students, such as the belief that they are unmotivated, mainly arise from the loosening of parental and teachers' control, from the university student lifestyle.

In 2008, the National Union of Students prepared a survey among students at British universities concerning their experiences of life at universities (NUS Student Experience Report, 2008). A total of 3,135 students from 146 higher education institutions participated in the survey. Different types

of students were identified on the basis of the factors motivating them to attend university (Figure 2).
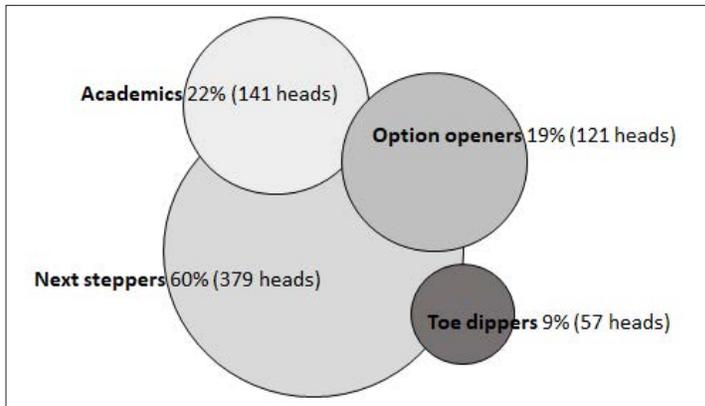
Figure 2. Motivation profiles – Motivations for attending university. Source: NUS Student Experience Report (2008, 6)

On the basis of our earlier research, we have found a significant link between teachers' effectiveness and their attitudes toward students, both in the secondary school and the higher education sample. Teachers' perceptions of students influence both their acceptance among students and the effectiveness of their work.

Research into how students and those working in higher education perceive each other and themselves as groups is missing and would be necessary.

Research design and methodology

We present one part of our research project its centre the questions and hypotheses stand mentioned below which were studied by mixed method.

The questions raised

- What features and types of students can be identified by university teachers?
- What do teacher think of the origin of the changes? Do they assume connection between changes and ICT tools?
- Do teachers have ideas, strategies to handle the students differently and to solve the noticed problems connected to the students?
- What are the „good practices" for make the different student types more motivated?
- Are there differences in the teachers' student image according to the gender, the years of teaching experience, have a teacher degree or not?

Hypothesis

- Majority of teachers thinks the tendency of the changes of the students are negative.
- Majority of teachers blame at least partly the enhanced usage of ICT tools for the changes of the students.
- Women, teachers with more experience and certificated teachers mention more positive elements connecting to students.

Data collection and tools

We developed and used questionnaires for university teachers, also conducted semi-structured in-depth interviews with a smaller group of them.

Survey with questionnaire

The use of the questionnaires was reasoned by the need to collect data from the largest possible number of teachers covering a diversity of areas. Questionnaires for teachers was improved in such a way that the questions pertaining to the motivational and learning characteristics of students and to the methods used in higher education would be included. The teacher questionnaires were completed online. The data collected were primarily subjected to a quantitative analysis by using SPSS.

Interviews

We also did semi-structured in-depth interviews with some of the teachers, in order to be able to make in-depth analyses and to further nuance the quantitative results. The interviews were conducted on the basis of a prepared outline, allowing the subjects also to go more into depth in certain topics, depending on their reactions and needs. The transcripts of the interviews were primarily analysed using a procedure of qualitative textual analysis.

The sampling method and the features of the sample

Starting out from our own institutional profile, the scope of our research project covered teachers and students in economic higher education, because we specifically aimed to provide assistance to them with the findings. The data was collected among teachers in the related programmes of six Hungarian universities. The sampling took place with a combination of the convenience and the snowball sampling methods. We contacted the teachers, through a network of acquaintances and on the basis of lists of addresses collected from the websites of economic higher education institutions, either in person or by way of electronic mail specifically addressed to them.

The teachers' questionnaire was completed by 210 (57% female and 43% male) university teachers. In addition, we also conducted interviews with 42 teachers (44% female and 56 % male). The sample of respondents was representative for their respective institutions, although not nationally.

The characteristics of the teachers participating in the survey:

The average age of the respondent teachers was 48.5 years (the youngest was 26 and the oldest respondent was 77 years old), the average length of their experience in higher education was 18.7 years (between 1 and 54 years). 51% of the respondents were certified as teachers, 2% were in the process of pursuing such studies, and 47% had no teacher certification.

Features of the teachers who gave answer to the interviews:

The average length of teaching experience of the interviewees was 17.6 years. 50% of them were certified as teachers, and one person was in the process of pursuing such studies. The interviewees represent the general sample of respondents by questionnaires well. 47% of them have experience teaching in secondary education as well.

Findings

On the basis of questionnaires, nearly half of the teachers consider the changes experienced in connection with the students over the past few years and decades as definitely negative (see Figure 3). Less than one-fifth of all respondents have the opinion that the changes in connection with the students are definitely positive. A little over one-third of teachers who answered, have a balanced, more nuanced opinion on the students.
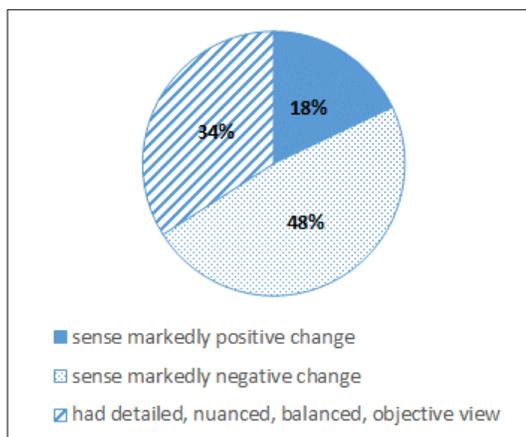

Figure 3. What kind of changes did the teachers sense connedted the students based on the questionnaires (210 teacher respondants). Source: Own adjustment based on the collected data

In the present paper, we intend to provide a deeper, more refined analysis of the views and opinions of teachers on students, on the basis of interviews conducted.

The interview included a question specifically pertaining to students ("Are today's students different than those before? Please provide your reasons for your answer."), but elements related to students were also formulated at several other points in the interviews. In the texts, we identified 123 elements pertaining to students, which we then systematized on the basis of various criteria.

The first criterion was whether the element was a positive, negative or objective statement as regards students, or perhaps one in which positive and negative evaluations are mixed. Based on the texts of the interviews the majority of the statements were negative. Less than 10% were positive evaluations of students, while a third of them were objective or containing elements of mixed evaluations.

From the point of view of content, we differentiated between three groups: elements serving the purpose of describing and characterising students (mentioned 89 times); elements related to the relationship between teachers and students (mentioned 15 times); and finally, elements in which teachers also formulated some kind of methodological recommendations and/or proposed solutions to handle the student characteristics sensed by them (mentioned 22 times). (Some elements could be placed in several categories.)

Descriptions of the students

In the descriptions of students, negative elements dominated once again (74%). There were also general, simplifying statements, such as "the quality of the students is continuously deteriorating," and in some (a total of four) cases, the interviewee responded to the question with a single adjective. More than 90% of the teachers, however, explicated their comments related to students at more length, with an average of three specific characteristics mentioned. The most frequently mentioned negative characteristics were the following:

- the decrease of interest, motivation, the lack of commitment;
- the lack of willingness to invest energy and time, which is manifested in missing classes, striving to fulfil only the bare minimum level of requirements, low level of activity, doing something else in class, avoiding activities requiring persistence and concentration;
- lack of independence, responsible behaviour and/or purposefulness;
- gaps in necessary academic grounding, general education, or vocabulary, resulting in difficulties in making associations, incorporating

new elements; due to superficial knowledge, they are easy to influence;
- underdeveloped skills in the fields of communication, conflict management and teamwork;
- missing desire to conform.

A general teaching methodological consequence of the above is the difficulty of creating and maintaining discipline and attention. In comparison with our prior expectations, generational theories were offered only in few cases as an explanation.

The source of teachers' disappointment related to students is the non-fulfilment of their expectations based on earlier experiences. Few respondents identified positive elements concerning the students in difference from their expectations. What could be in the background of this is that few teachers discover new virtues of students, or maybe because they do not have many such virtues related to their academic activities.

Only 6% of the abovementioned student characteristics were positive, which are listed below:
- Generation Z is more curious;
- they are more open;
- students are more self-assertive, they know what they want to do for work, and prepare for it consciously;
- their knowledge is different, but we can clearly see the many smart kids and how many things they can solve with their phone, for example;
- in the last two years, students have become more ambitious, they are not as lethargic as a few years ago;
- they appreciate notes on the whiteboard, because otherwise they are just looking at their phones;
- they are better at verbal activities and in presentations.

20% of the descriptions of students were objective or included both positive and negative elements. The following are some examples:
- "There are many guileful and soft-soaping students, but then I realized that the well-mannered kids are also there, and they suffer from the former group as well";
- "the majority are busy with some job, and they don't really work while studying, but rather study while working";
- "they have more specific expectations when it comes to the lessons and the course material";
- "the changes in attitudes are rather negative, but as I know this age group, the students of the university belong to the elite";
- "they are pulling in the direction of the corporate world";

- "students no longer know what they still knew five years ago, but they are also familiar with technologies that I have no clue about."

In response to the question inquiring about changes in students, there were 15 references to the use of electronic devices as a factor with a strongly influence on student characteristics. Three of these pertained to students confusing knowledge with information that is readily available on the internet. "Just because he pulls up a verb conjugation table on his phone, he won't be able to use in real situations when speaking, this must be learnt." "The use of gadgets appears to be some sort of knowledge, but it cannot substitute for knowledge of a subject." "They think that they can learn everything from the internet and from Facebook."

- According to some teachers, students are practically addicted to their devices (mentioned five times). This was suggested by phrasings such as "they are glued to their gadgets" and "continuous online presence."
- Some respondents drew a link between weakening literacy and the increased use of electronic devices. "They cannot write by hand, and I cannot read their writing, and for this reason I am not willing to give them a paper and pen test, only an electronic one."
- Some respondents firmly believed that the reasons for the changes in the students are not to be found in the digital age. "It is harder not because they are the digital Generation X or Y, but because of the *lack of examples* that would offer them values."
- Some colleagues prepare for the changes between generations of students consciously and with joy. "I am already preparing for Gen Z students arriving soon; probably they will need a different approach in teaching."

Changes in the teacher-student relationships

When thinking about the student characteristics, teachers mentioned 15 elements that allow us to draw some conclusions concerning the changes in teacher-student relationships. Among these, teachers reported on negative changes in 7 and on positive ones in 2 cases, while in 6 cases, we received answers containing objective, or both positive and negative elements.

The negative elements were related to students no longer considering their teachers as unquestionable authorities. These includes statements such as "earlier, teachers had authority, but today, students respect teachers less," "they are a bit more disrespectful", "they do not believe that the teachers would say something wise." "What they do not understand is that we provide them with a foundation, and we cannot teach them

everything specific to a given field, it is not possible." "Maybe they even look down on us (teachers) because we do not have the latest gadgets."

Lubicz-Nawrocka (2019) has different results which mean that there is a key role of teachers in the students' idea of the excellent education. The teachers' efforts, helpfulness, trials to involve students and the direct behaviour of teachers are appreciated by students.

Elements were considered as positive when teachers reported that the more direct teacher-student relationship gave them a good feeling, or when teachers found it a positive experience when they could regularly learn something from their students.

Elements related to teaching methodology

From the point of view of reducing drop-out rates, it is important to see whether teachers can respond to the changing student characteristics effectively by way of their teaching methods and practices. In their characterizations of students, teachers formulated methodological conclusions in 22 cases. These showed both overlaps and contradictions.

There is a need for the reinterpretation of the teacher's role: the teacher should become more of a mentor, a person facilitating the synthesizing of knowledge. An investment of quality time is needed when the students and the teachers can immerse in the material together. These findings are same to the results of Lubicz-Nawrocka (2019). Achieving a mass change in the current generation of students is not possible, and therefore, teachers need to find a way to adapt. By contrast, there was also a respondent who concluded that "it is not me who needs to change." Many of the teachers welcomed teacher-student relationships becoming more direct, and considered it as a factor improving efficiency.

The introduction of new methods of testing and examination, such as online examinations, points earned continuously during the year on the one hand due to the deteriorating writing skills, and on the other hand because of digital competences becoming stronger. Respondents referred to students' need for content-focused, substantial and positive feedback as an important need and one that needs to be satisfied.

Some of the respondents considered the simplification of the course material, the modification of its language ("translating it into the language of the students"), as well as the reduction of its quantity as possible ways to make progress. In the opinion of other teachers, however, simplification and reduction are not the right direction; the key is to select the right forms and channels through which the course material is conveyed to the students.

Many respondents consider abandoning the traditional genre of frontal, lecture-type instruction and/or its replacement with digital methods as the desirable way. In the opinion of others, the ICT competences of students cannot be utilized in learning, because "when I wanted to use it for educational purposes, they were shocked," and "they could not decide what is relevant and what is not."

Differences among teacher groups

We made Khi-square calculations to answer our question whether there are differences among teacher groups according to the to the gender, to the years of teaching experience, to existence or absence of teacher degree. Because of the low number of the participants of the interviews we found interesting frequences but none of them were significant.

Between the male and female teachers were not find differences not even on the level of frequences (see Figure 4). Both group mentioned positive, negative and balanced elements almost in the same amount.
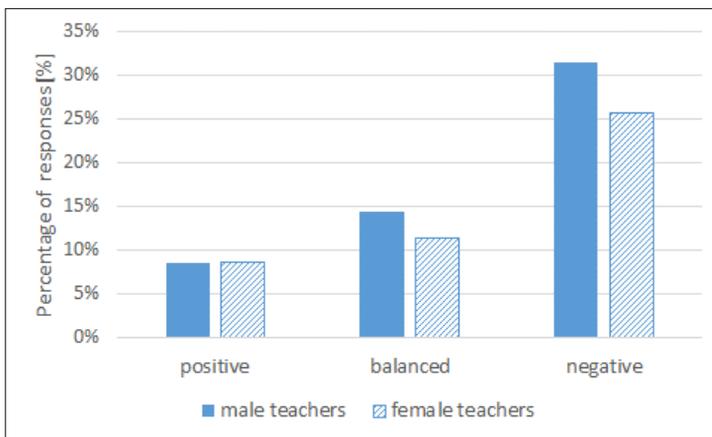

Figure 4. Positive, negative and balanced elements mentioned by male and female teachers about students.
Source: Own adjustment based on the interviews' data

Inspite of the similarities there was one interesting difference. The improving and changing the university teacher role in the direction of accept the student was suggested only by female teachers.

Based on the proportions the beginners sensed more positive features of the students than the more experienced teachers (see Figure 5).
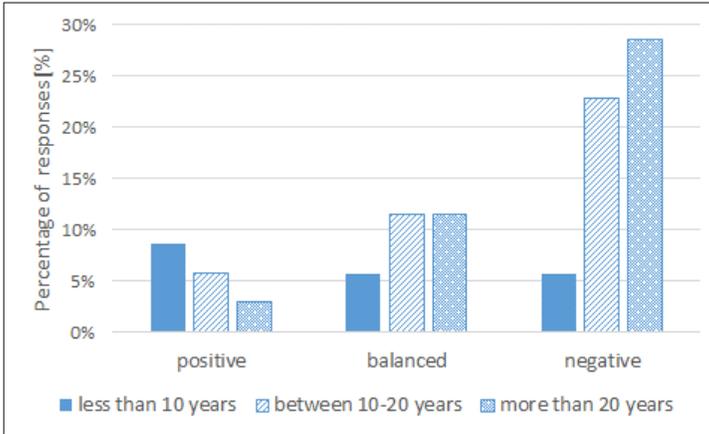
Figure 5. Students' features from the viewpoint of teachers
with different experience.
Source: Own adjustment based on the interviews' data

The most interesting difference was found between the teachers who
are certificated as a teacher and who are not. The certificated teachers
mentioned less positive and less negative features of the students but said
markedly more balanced elements than the other group of teachers (see
Figure 6).
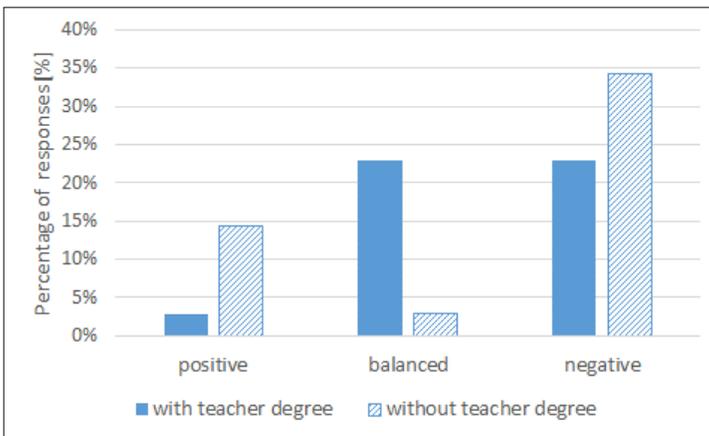
Figure 6. Evaluation of the students' change by certificated
and not certificated teachers.
Source: Own adjustment based on the interviews' data

The lecturers without teacher degree sensed the changes of the students
extreme. The hypotheses could not reinforced.

Student profiles based on teachers' opinion

In some of the interviews, the respondents described student types, characters in a detailed and nuanced way. In the following, we will present some of these.

The positive student character is motivated and purposeful.

One subtype is the typical eminent student, who never questions the content of the course material, does not inquire about purposes, and strives to perform at maximum level.

Another subtype consists of students who prepare their professional careers consciously, and are looking for elements in the course materials that are useful and directly applicable. They are critical, but aiming to cooperate and develop.

More different negative student characters appeared.

Students struggling with difficulties: Students with learning difficulties, special needs, specific learning disabilities. The fulfilment of the requirements poses great difficulties for them. In many cases, their fellow students are also rejecting towards them, because they feel that such students slow down or disturb the process of education. Teachers, on the other hand, are often perplexed about how to prepare or support them.

Life artists: Their university life is organized around good company and partying. For them, the primary benefit of their university studies is not learning but networking. The length of their study is often significantly longer than the original length of the programme.

The scoundrel: A contradictory student category in that they want to graduate, but also want to achieve this in the most energy-efficient way. Cheating, colluding, plagiarizing or other forms of academic dishonesty are not beyond them either, as they try to achieve their aim.

The aimless: An entirely aimless group of students who only study because their parents want them to. It was not their own decision or interest that motivated their choice of studies. They just want to survive the academic programme: they are not looking for any value in it, and often would not even recognize it even if it was right in front of them.

A balanced view of students. It was named „Working beside learning or learning beside working".

An increasingly large number of students also have jobs, either because they need the money to maintain themselves, or as a conscious career building act. They are typically motivated and talented students; however, in the interest of achieving the right balance between work and studying, they strive for a tight, efficient time schedule. They devote as much time to studying as necessary for fulfilling the requirements, and consequently, their results are often behind what could be expected on the basis of their capabilities.

Teachers' attitudes to new student characteristics

We also examined what the text of the interviews reveals about teachers' attitudes to students and their characteristics.

In case of the majority of the interviewees it could be felt that they are looking for solutions and have various attempts for handling the changes. The following summarizes the most frequently received answers to the questions aimed at collecting the best practices.

1. Increasing classroom activities and involving students.
2. Taking student characteristics into consideration when designing the course materials.
3. Putting practical considerations, a practice-oriented approach and applicability of the materials into the foreground.
4. Using ICT tools.
5. Strengthening the partnership nature of the teacher-student relationship.

In addition, the outlines of a different attitude are also taking shape, representatives of which would prefer to turn back the hands of time. The main elements of this attitude include that universities should be reserved for the best students only, problematic students should be removed, and we should return to the application of teacher-centred methods.

Discussion

Our results indicate that teachers consider the changes in connection with their students mainly as negative. On the one hand, they assume a devaluation of their own role in the eyes of their students. On the other hand, they experience the facilitation of students' learning as a significantly more difficult challenge. Their perceived situation in which they have to exert increased effort while weakened in their roles may, in the longer run, also decrease their motivations as teachers. These factors – teachers' perception of their role and their image of students – may be suitable for the screening of teachers at risk of being exhausted or burnt out.

Our earlier research indicated positive attitudes toward students correlate with the effectiveness of teachers (Fűzi and Suplicz, 2016). The question arises whether teachers can maintain positive attitudes – and if so, how – if they consider students' characteristics as negative as the findings above seem to indicate.

In future research, we plan to examine whether teachers did not discover or mention the positive characteristics of today's students:

- because the interview was a good opportunity for venting complaints, or
- because these are so different from the characteristics of earlier generations of students that teachers do not yet have a sense of these

as elements useful in education, they do not know how to build on these; or

• because the changes in the current generation of students are indeed only negative from the point of view of teaching and learning.

A limitation is inherent in the fact that we have no information on the quality of the respondents' work. It would be useful to compare the quality of teaching against the teacher's perception of the students. A possible next step would be the observation and analysis of the lessons taught by the interviewed teachers and/or the evaluation of their work by their students. With the help of these methods it could be explored how the teachers' attitudes toward students are manifested in a classroom environment, and how well the best practices and methodological conclusions drawn can work.

The next station of our analytical work will be to compare the self-evaluations of the students participating in the research project with the teachers' perceptions discussed above. We should identify the points where the opinions of students and teachers are the same or significantly different.

Conclusions

In our paper, we examined the experiences and perceptions of 42 teachers working in Hungarian economic higher education concerning their students, on the basis of semi-structured in-depth interviews with the teachers.

On the basis of the quantifiable results, the majority of teachers considered the changes related to the student population with respect to learning as unfavourable. The learning and the teaching are rendered more difficult, for example, by the weakening of students' motivation and commitment, which causes problems in terms of creating and maintaining attention and discipline. Students' less thorough prior grounding and lack of general knowledge makes it more difficult for new elements of knowledge to be incorporated. Only few teachers identified positive changes. Objective or more balanced descriptions of students, containing positive and negative elements as well, only occurred in one-fifth of the cases.

The qualitative analyses provide a taste of the diversity of teachers' modes of thinking.

The changes related to students were linked by teachers to the digital age and the use of devices to the point of addiction in 16% of the responses. The majority of these blame these for the deterioration of learning skills. Two respondents mentioned, however, that with the use of these devices, students can be more efficient in problem-solving, and that it is worth learning from them in this respect.

The teachers interviewed also formulated some conclusions pertaining to the relationships with students and to teaching methodologies. Some teachers feel that students do not consider teachers advantage in knowledge and leadership role as self-obvious. Others, however, welcomed the shift in teacher-student relationship towards more of a partnership. The respondents drew very different conclusions as far as the methods of teaching are concerned. Some would consider a more intensive use of digital devices advisable, while others think it would be best if they were banned. There were respondents arguing for a simplification of the language of the course materials, in contrast with those who believe the channels used for conveying the material are more important.

We highlighted the student types described by the interviewees in quite some detail, such as:
- eminent students;
- critical, purposeful career-builders;
- strugglers;
- life artists;
- scoundrels;
- the aimless;
- students working while studying or studying while working.

We wish to continue our work with a deepening of the analyses, as well as on developing and offering trainings to support the teachers.

In addition, we plan to extend our research to cover the following questions:
- To what extent does the burden borne by teachers, weakened in their roles and exerting increased effort to be effective, accelerate exhaustion and burn-out?
- Can teachers' positive attitudes toward their tasks and the students be maintained, while their perception of the students is negative?

On the basis of our findings, the proposed content of the trainings to be organized for the teachers:
- the selection of methods appropriate to the specific student characteristics;
- the deepening of teachers' knowledge concerning their students;
- establishing a dialogue between teachers and students.

After all we close our work useing the analogy of Professor Pál Michelberger: "We expect birds to fly, swim and run well. Eagles are excellent flyers, but they cannot run or swim, ostriches are excellent runners, but they cannot swim or fly, while penguins are excellent swimmers, but they cannot fly and only waddle. On the other hand, gees can swim, run and fly a little bit, but they are not excellent in any of these. On my part, I would

like to see more eagles, ostriches and penguins in higher education, and fewer geese." (qtd. in Balázs, 2014:554).

Acknowledgement

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LATVIA STUDENTS' INTEREST IN DIFFERENT SCIENCE SUBJECT TOPICS

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ABSTRACT

Students' interest in science subjects is insufficient in different countries. One of the main reasons of decreased students' interest in science subjects is that often science subjects in schools are taught in a traditional way, separated from real life, and it is difficult for students to relate their knowledge to their personal interests. The aim of the study was to clear out Latvia students' interest in different science subjects and science subject topics. The electronic survey of Latvia students from different specialities was carried out. 12th-grade secondary school students from two Riga schools, University of Latvia 1st course pedagogical specialities students, University of Latvia Riga Medical College 1st course doctors' assistant program students and Latvian Academy of Music 1st-course students were surveyed. Altogether 235 students were questioned. The results of the research showed that the interest of Latvia students from different specialities in physics and chemistry is rather low: many students have average interest in topics of these subjects. The lowest interest in physics and chemistry from surveyed student groups have Latvian Academy of Music students. The most interesting physics topic for all student groups is the structure of the Universe. From chemistry subject topics secondary school students are more interested in types of chemical reactions and electrolytic dissociation theory and carbohydrates, fats and oils. The majority of the University of Latvia pedagogical specialities students are not interested in different topics of chemistry. Most of all Latvia students are interested in biology. University of Latvia Riga Medical College doctors' assistant program students are most of all interested in biology from surveyed student groups. The most interesting topics of biology for all student groups are genetics and gene engineering, the human organism, human health, origin and evolution of life and ecology. The majority of students have average interest in such topics as construction and diversity of plants. An important task of teachers is to find out a way, how to raise students' interest in science subjects. Teachers should use a student-centred approach and interactive methods for teaching science subjects in order to achieve the personal interest of students in acquiring science subjects.

Keywords: students, science subjects, interest, physics, chemistry, biology.

Introduction

One of the most important factors influencing the growth of public well-being is students' science literacy. Students' science literacy has the essential role in the development of modern science and technologies driven economy (Cedere et al., 2015). Nevertheless, investigations reveal the contradiction between the increasing social needs and the insufficient level of young peoples' education in sciences (Birzina & Cedere, 2017). Studies have shown that different countries students have insufficient interest in science subjects (Cedere et al., 2014, Cedere et al., 2018). One of the main reasons of decreased interest of different countries students in science subjects is that often science subjects in schools are taught in a traditional way, separated from real life, and it is difficult for students to relate their knowledge to their personal interests (Cedere et al., 2015). There are many factors affecting the motivation of pupils towards science subjects in modern educational practice. External factors could form the positive attitude of pupils, such as cooperative projects of pupils, teachers and scientists, joint programs and dissemination of research activities. Some internal factors related with educational practice and constructive learning paradigm (integrated teaching and structured-coordinated research) are important as well (Pečiuliauskienė, 2012).

Decreasing interest in Science among students calls for the need to revise the contents of the curricula for Science subjects, including Biology. Modern Biology curricula should not only contain key biological concepts but also provide a teacher with sufficient space to develop students' competencies of scientific work and positive attitudes to Science. When preparing the curriculum, it is necessary to consider also students' interest in selected curriculum topics and their benefit for everyday life. The research confirmed the positive interest in Biology among the majority of students who prefer direct, active participation in the process of knowledge acquisition through the study and exploration of living organisms as well as by the execution and assessment of practical works and experiment (Čipkova et al., 2018). The students' attitudes and self-efficacy beliefs in science subjects should be taken into account in secondary school biology education, because gender stereotypes and low self-efficacy beliefs may affect students' future career plans (Uitto, 2014). Several avenues are open to students who wish to study advanced science or mathematics in high school, which include Advanced Placement courses and teacher-designed courses unaffiliated with organized programs (Sadler et al., 2014).

The successful way to gauge and foster students' interest in science subjects is to understand the ways in which students express curiosity about the nature of an object, phenomena, or a given topic (Luce & Hsi, 2015).

The teacher's personality and professional mastery have great importance on promoting students' cognitive interest. Interactive teaching/learning methods developing analytical thinking and practical skills promote the acquisition of the science subjects (Cedere et al., 2016). Studies have shown that integration into classroom the science education of short presentations of cutting-edge science and emerging technologies has positive impact on students' learning outcomes (Michael et al., 2017). Career-related instructions implemented in secondary school science education is a way how to rise students' interest in subject and to promote students' science career awareness (Salonen et al., 2018).

Teachers and professors of life science subjects have come to the conclusion that many college students have difficulties in studying science subjects (mathematics, physics, chemistry), and they see the main reasons of these difficulties in shaky background of students arriving at the college level and difficulties in seeing the purpose of studying these subjects (Taly et al., 2019). So it is necessary clearly demonstrate the importance of studying these subjects and show them how concepts that might seem at first very abstract have a high practical use in biology. Previous experiences have taught that traditional lectures do not constitute an appropriate and efficient solution to these issues, even when a lot of care is put into showing examples and applications from biology. The teachers found that effective way how to rise students' interest about science subjects is the one-week workshop. The workshop adopts a large variety of teaching methods including group activities, practical activities and online games and demonstrations. The goal of the workshops was to boost students' interest and motivation by showing them through unconventional teaching how all subjects matter and how the knowledge from very different disciplines is needed to be able to tackle interesting and fundamental biological questions. For example, professors developed a workshop based on the theme of the interaction of biomolecules with drugs. Students were asked to investigate how caffeine and nicotine work at the molecular level. Taking a wider perspective this concept and methods can be easily exported for the other scientific disciplines. The main key to developing similar workshops is to find the appropriate subject in which students are interested and to use appropriate pedagogical methods (Taly et al., 2019).

The important question is how the composition of the courses affects the domain-specificity of these constructs. Using data from a large-scale study in Germany, scientists compared ninth-grade students who were taught science as an integrated subject with students who were taught biology, chemistry, and physics separately with regard to the dimensional structure of their self-concepts and interests (Jansen et al., 2019). Whereas the structure of the constructs was six-dimensional in both groups (self-concept and

interest factors for biology, chemistry, and physics), the correlations between the domain-specific factors were higher in the integrated group. The pattern of gender differences differed across groups. Whereas male students generally showed higher self-concept and interest in physics and chemistry, a small advantage for male students in biology was only present in integrated science teaching group. The conclusion is that aspects of the learning environment such as course composition may affect the dimensional structure of motivational constructs (Jansen et al., 2019).

Successful studies of young people in science-related professions and interest in these fields are closely correlated with the experience and interest in science subjects acquired during primary school. Research has shown that attending a high school with a science, technology, engineering, and/or mathematics (STEM) program has a positive association with students' STEM-related outcomes (Bottia et al., 2017). Studies have shown, that access to internet with appropriate speed, different databases, equipping the research labs for scientific research and providing the advanced laboratory devices, financial support of university research unit and encouraging the students in different ways, can strengthen the participation of students in conducting research activities and promote their scientific career (Safari et al., 2015).

Aim of the Study

The main goal of this research is to identify Latvia students' interests in science subjects. An important task of teachers and educators is to rise students' interest in science subjects. In order to rise this interest, it is necessary to find factors that influence students' motivation to learn, methods which are most appropriate for rising students' interest in science subjects and to know in which topics of science subjects different students are more interested. The aim of the study was to clear out different groups of Latvia students' interest in science subjects and science subject topics.

Materials and Methods

The electronic survey of Latvia students from different specialties was carried out. 12th grade secondary school students from two Riga schools, the University of Latvia 1st course pedagogical specialties students, the University of Latvia Riga Medical College 1st course doctors' assistant program students and Latvian Academy of Music 1st course students were surveyed. Altogether 235 students were questioned (96 secondary school students; 73 the University of Latvia pedagogical specialties students; 34 the University of Latvia Riga Medical College doctors' assistant program

students and 32 Latvian Academy of Music students). The survey was worked out in order to clarify Latvia students' interest in different science subjects and different science subject topics.

Results

Results of the survey about students' interest in different science subjects are displayed in Figure 1 till Figure 3. Results of the research showed that the majority of students have average interest in physics (see Fig. 1). Only 11% of secondary school students are very interested and 16% of them are interested in physics. University of Latvia students are less interested in physics in comparison with secondary school students. Only 7% of the University of Latvia pedagogical specialties students and the University of Latvia Riga Medical College doctors' assistant program students are very interested in physics, but 12% of pedagogical specialties students and 16% of doctors' assistant program students are interested in physics.
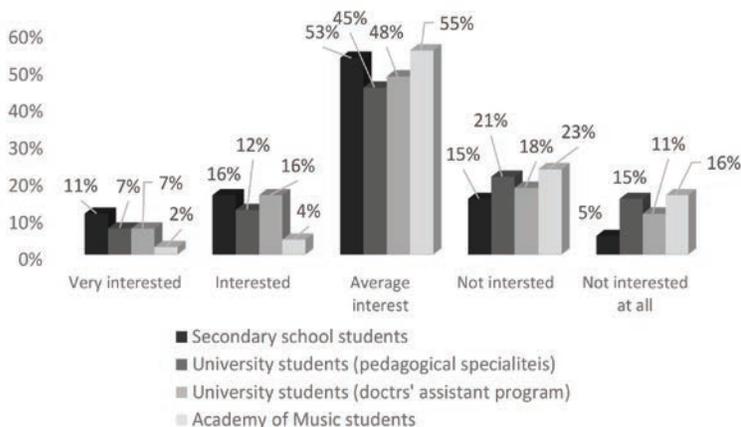

Figure 1. The interest of Latvia students from different specialties in physics (in % from the number of respondents in groups)

Less of all interested in physics from different student groups are Latvian Academy of Music students: 23% of Latvian Academy of Music students are not interested in physics and 16% of Latvian Academy of Music students are not interested in physics at all. Many pedagogical specialties students also are not interested in physics: 21% of pedagogical specialties students are not interested in physics and 15% are not interested in physics at all.

Latvia students' interest in chemistry is not high as well (see Fig. 2). 9% of secondary school students are very interested in chemistry and 16% of them are interested in chemistry but the majority of secondary school students (56%) have average interest in chemistry. Less of all interested in chemistry

are Latvian Academy of Music students: only 3% of them are very interested in chemistry and 7% are interested in chemistry but 27% of them are not interested in chemistry and 17% are not interested in chemistry at all.
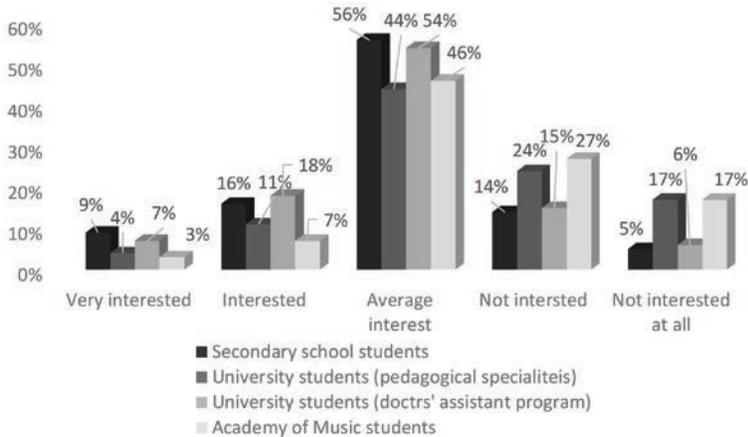

Figure 2. The interest of Latvia students from different specialties in chemistry (in % from the number of respondents in groups)
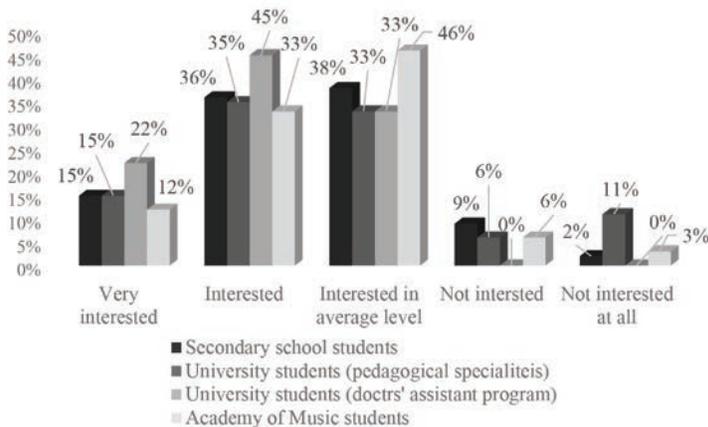
Figure 3. The interest of Latvia students from different specialties in biology (in % from the number of respondents in groups)

Latvia students' interest in biology is higher than in physics and chemistry (see Fig. 3). Most of all interested in biology are Latvian University doctors' assistant program students: 22% of them are very interested in biology and 45% are interested in biology. The other student groups are rather interested in biology: 15% of secondary school students are very interested in biology and 36% are interested in biology, 15% of pedagogical specialties students are very interested in biology and 35% are

interested in biology. 12% of Latvian Academy of Music students are very interested in biology and 33% are interested in biology.

Results of the survey about students' interest in different science subject topics are displayed in Table 1 and Table 2. From topics connected with physics secondary school students are more interested in such topics as the structure of the Universe (27% of students are very interested and 46% of students are interested), electricity and magnetism (14% of students are very interested and 22% of students are interested) and radioactivity (9% of students are very interested and 36% of students are interested) (see Table 1). Secondary school students are less interested in thermodynamics (21% of secondary school students are not interested at all) and particle physics (17% of secondary school students are not interested at all).

Table 1. Latvia secondary school students and University of Latvia pedagogical specialties students interest in different science subject topics (in % from the number of respondents in groups)

Topics	Secondary school students					University students (pedagogical specialities)				
	1	2	3	4	5	1	2	3	4	5
Mechanics	6	17	55	19	3	11	17	34	19	19
Thermodynamics	2	7	52	18	21	4	11	31	29	25
Electricity and magnetism	14	22	52	9	3	6	19	29	23	23
Waves and quantum physics	9	17	46	19	9	4	13	35	29	19
Radioactivity	9	36	32	18	5	7	15	25	39	14
Particle physics	6	11	37	31	17	2	6	31	42	19
The structure of the Universe	27	46	18	9	0	13	29	34	12	12
Properties of substances	9	17	46	11	17	7	13	33	31	16
Types of chemical reactions	4	33	43	9	11	6	19	25	27	23
Electrolytic dissociation theory	6	24	32	19	19	4	11	21	41	23
Electrolysis	5	9	52	17	17	4	11	23	39	23
Spirits, carboxylic acids and amino acids	9	9	46	27	9	2	8	25	40	25
Carbohydrates, fats and oils	9	21	34	27	9	2	19	31	27	21
Construction and diversity of plants	18	37	27	16	2	11	39	32	9	9
Construction and diversity of animals	25	37	27	9	2	17	38	31	8	6
Human organism	27	40	29	4	0	36	25	29	4	6
Human health	29	49	18	4	0	52	27	17	2	2
Origin and evolution of life	32	52	9	7	0	25	29	36	6	4
Cell structure	4	17	52	25	2	13	21	45	12	9
Diversity of living organisms	9	48	21	18	4	19	31	39	5	6
Genetics and gene engineering	37	37	17	9	0	44	31	21	2	2
Ecology	9	21	52	18	0	15	33	37	6	9

Note: 1 – very interested; 2 – interested; 3 – average interest; 4 – not interested; 5 – not interested at all

University pedagogical specialties students are more interested in the structure of the Universe (13% of students are very interested and 29% of students are interested) and mechanics (11% of students are very interested and 17% of students are interested). University doctors' assistant program students are interested in the structure of the Universe (9% of students are very interested and 15% of students are interested) (see Table 2) but they are not interested in waves and quantum physics, thermodynamics and radioactivity. The majority of Latvian Academy of Music students are not interested in topics of physics, except the structure of the Universe.

From chemistry subject topics secondary school students are more interested in types of chemical reactions (4% of students are very interested and 33% of students are interested) and electrolytic dissociation theory (6% of students are very interested and 24% of students are interested). The majority of the University of Latvia pedagogical specialties students are not interested in different topics of chemistry such as spirits, carboxylic acids and amino acids (25% of the University of Latvia pedagogical specialties students are not interested at all), types of chemical reactions, electrolytic dissociation theory, electrolysis (23% of the University of Latvia pedagogical specialties students are not interested at all). Some of the University of Latvia Riga Medical College doctors' assistant program students are interested in such topics of chemistry as properties of substances and types of chemical reactions (11% of students are very interested in these themes).

The majority of Latvian Academy of Music students have average interest or they are not interested in different topics connected with chemistry, such as electrolysis (24% of Latvian Academy of Music students are not interested at all) and electrolytic dissociation theory (22% of Latvian Academy of Music students are not interested at all).

All student groups are more interested in biology subject topics in comparison with topics of physics and chemistry. Students are especially interested in such topics as: genetics and gene engineering (37% of secondary school students, 44% of University pedagogical specialties students, 33% of University doctors' assistant program students and 15% of Latvian Academy of Music students are very interested in these themes); human organism (27% of secondary school students, 36% of University pedagogical specialties students, 27% of University doctors' assistant program students and 22% of Latvian Academy of Music students are very interested in these themes); human health (29% of secondary school students, 52% of University pedagogical specialties students, 34% of University doctors' assistant program students and 27% of Academy of Music students are very interested in these themes) and origin and evolution

of life (32% of secondary school students, 25% of University pedagogical specialties students, 18% of University doctors' assistant program students and 14% of Latvian Academy of Music students are very interested in these themes).

Table 2. University of Latvia doctors' assistant program students and Latvian Academy of Music students' interest in different science subject topics (in % from the number of respondents in groups)

Topics	University students (doctors' assistant program)					Latvian Academy of Music students				
	1	2	3	4	5	1	2	3	4	5
Mechanics	5	14	46	22	13	2	2	43	37	16
Thermodynamics	3	11	45	24	17	0	2	38	41	19
Electricity and magnetism	5	11	56	15	13	3	6	53	27	11
Waves and quantum physics	2	9	44	24	21	2	3	37	37	21
Radioactivity	7	11	23	38	21	2	9	37	33	19
Particle physics	5	17	34	22	22	0	4	41	31	24
The structure of the Universe	9	15	42	22	12	11	6	56	27	0
Properties of substances	11	17	44	16	12	4	6	44	37	9
Types of chemical reactions	11	18	39	18	14	5	9	46	23	17
Electrolytic dissociation theory	2	11	33	33	21	2	5	41	30	22
Electrolysis	3	21	54	11	11	3	6	40	27	24
Spirits, carboxylic acids and amino acids	7	11	33	28	21	7	9	43	26	15
Carbohydrates, fats and oils	9	22	22	28	19	6	11	45	25	13
Construction and diversity of plants	11	21	33	22	13	11	17	48	20	4
Construction and diversity of animals	14	22	34	19	11	17	21	47	11	4
Human organism	27	34	39	0	0	22	33	44	9	2
Human health	34	37	29	0	0	27	41	27	5	0
Origin and evolution of life	18	22	49	11	0	14	33	45	4	4
Cell structure	11	36	42	11	0	12	15	55	14	4
Diversity of living organisms	17	38	41	2	2	17	19	53	9	2
Genetics and gene engineering	33	56	11	0	0	15	26	48	7	4
Ecology	33	45	22	0	0	17	24	52	5	2

Note: 1 – very interested; 2 – interested; 3 – average interest; 4 – not interested; 5 – not interested at all

Students are also interested in topics connected with ecology, for example, 33% of the University of Latvia Riga Medical College doctors' assistant program students are very interested and 45% of them are interested in these topics. The majority of students have average interest in such topics as construction and diversity of plants.

The results of current research correlate with the results of other studies, which suggest that students usually have the higher interest in biology but the interest in chemistry and physics is lower (Lamanauskas et al., 2004). An important task for teachers is to find out a way, how to raise students' interest in science subjects. The methods which raise students' interest in science and help gaining understanding about the nature of the science are experiment demonstrations and laboratory works (Cedere et al., 2016) and group works and discussions (Porozovs et al., 2015), and teachers are advised to use these methods during lessons.

Conclusions

1. The interest of Latvia students from different specialities in physics and chemistry is rather low: many students have average interest in these subjects. Latvia students' interest in biology is higher than in physics and chemistry.
2. From topics connected with physics students are most of all interested in the structure of the Universe. Secondary school students are also interested in electricity and magnetism and radioactivity, University of Latvia pedagogical specialties students in mechanics but University of Latvia Riga Medical College doctors' assistant program students in radioactivity. The majority of Latvian Academy of Music students are not interested in topics of physics.
3. From chemistry subject topics secondary school students are more interested in types of chemical reactions, electrolytic dissociation theory and carbohydrates, fats and oils but University of Latvia Riga Medical College doctors' assistant program students in types of chemical reactions and carbohydrates, fats and oils. The majority of the University of Latvia pedagogical specialities students and Latvian Academy of Music students are not interested in different topics of chemistry.
4. The most interesting topics of biology for all student groups are genetics and gene engineering, the human organism, human health, origin and evolution of life and ecology. Most of all interested in biology from surveyed student groups are the University of Latvia Riga Medical College doctors' assistant program students.

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THE IMPACT OF NATIVE LANGUAGE AND CULTURE ON FOREIGN LANGUAGE LEARNING: THE CASE OF CHINESE STUDENTS LEARNING THE LATVIAN LANGUAGE

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ABSTRACT

Multilingual and multicultural learning space has become the apparent reality students need to function in. Foreign language (FL) teaching methodology is one of the key areas FL educators focus attention on in view of the necessity to elaborate practices taking into account the cultural peculiarities and background of diverse target audiences. While the elaboration of FL teaching methodology for common languages is obviously the core activity of numerous scholars worldwide, less common languages within foreign language teaching and learning need conscious and thought-through attention to be paid to.

The introduction of the Latvian language as a foreign language to Chinese students dates back to 2011 when the first comprehensive course in the Latvian language as an elective course was launched in Beijing Foreign Studies University (BFSU) in the People's Republic of China. Since then another university – Beijing International Studies University (BISU) – introduced the study programme on the Latvian language and culture in 2015.

The article explores the case of Chinese students of BISU learning the Latvian language as a foreign language focusing specifically on the impact of their native language and cultural background on foreign language learning.

Given that language is one of the key markers of identity, the results of the study revealed that such factors as similarities and differences in the structure of languages impact the successful FL acquisition and should be taken into account in the process of the development of FL courses for students of diverse backgrounds. Every level of linguistic structure is to be addressed in a particular way providing the comprehensive framework for learning the Latvian language from the Chinese speakers' perspective.

Introduction

Under the policy of The Belt and Road Initiative and 17 + 1 Framework of cooperation between China and Central and Eastern European Countries, the links between People's Republic of China (PRC) and the Republic of Latvia are becoming stronger and education field is one of the main priorities for both parties. Over the last several decades Chinese students have become increasingly visible in the European higher education area. According to official statistical data (National Bureau of Statistics of China, 2018), 608400 Chinese students studied abroad in 2017, which makes PRC the more and more important market also for Latvian higher education institutions. Although the educational migration from China may still be driven by state programmes as in the afore-mentioned case, the career strategies of individual Chinese students and their families are coming to the fore (Thøgersen, 2016).

The research on the experience of Chinese students enrolled in Latvian higher education programmes and on the institutions that receive them is very limited. In order to meet the needs of incoming students from PRC and to be an attractive destination for them, it is crucial for Latvian higher education institutions to understand the background of the students for their successful integration into Latvian higher education space and to provide a competitive education offer, which would address the needs of the particular target group.

The article reports the selected results, namely, the results of the narrative analysis, of the study conducted in the framework of the project "Multilingual and Multicultural University: Preparation Platform for Prospective International Students" (No. 1.1.1.2/VIAA/1/16/019). The overall goal of the project is to contribute to successful integration of prospective international applicants through the development of the integration framework addressing the language and cultural needs for the studies in Latvian higher education institutions.

The research problem is determined by the indispensable and urgent necessity to explore the potential and the actual state of internationalisation process implementation in the sector of higher education in Latvia placing integration of international students of diverse linguistic and cultural backgrounds in the Latvian education space as the main research focus.

Therefore, the ultimate vision of the project is to create structured, innovative framework for the integration of potential international students in the Latvian learning space aiming to provide them with the possibility to experience host country culture and gain the necessary knowledge and skills to successfully adjust to the new environment and context of the host country (Latvia).

The Aim of the Study

In Latvia there is no in-depth research on the peculiarities of the integration of Mandarin Chinese speaking students of Asian origin in Latvian higher education space as well as there is no research on challenges related to language learning and support provision to resolve them. Therefore, the research aimed to: 1) explore which strategies Chinese university students use for foreign language learning, and 2) identify how the target students' language and cultural background impacts the process of the Latvian language learning, namely, gain understanding of the pattern for the Latvian language learning among Chinese university students.

Theoretical Background

Higher education (HE) internationalisation has become one of the top state priorities, which is reiterated in the missions and visions of Latvian higher education institutions, as it is the most significant indicator of global competitiveness. The revised definition states that internationalisation is "the intentional process of integrating an international, intercultural or global dimension into the purpose, functions and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society" (de Wit et al., 2015: http://www.europarl.europa.eu). Drennen (2002) presents a list of criteria relevant for consideration within the HE curriculum design aimed at achieving the key goal of internationalisation initiatives. The criteria identified may form the basis for the template for the purposes of planning, implementing and evaluating the international curriculum within the HE: 1. developing citizens of the world to live together; 2. building and reinforcing a student's sense of identity and cultural awareness; 3. fostering the recognition and development of universal human values; 4. stimulating curiosity and inquiry to foster a spirit of discovery and enjoyment of learning; 5. equipping students with the skills to learn and acquire knowledge, individually or collaboratively, and to apply these skills and knowledge across a broad range of areas; 6. providing international content whilst responding to local requirements and interests; 7. encouraging

diversity and flexibility in pedagogical approaches; 8. providing appropriate forms of assessment and international benchmarking (Drennen, 2002).

It is apparent that internationalisation strategies should go beyond mobility issues. It is high time to focus on the central issue within the higher education internationalisation perspective – equipping the graduates to effectively function in the global economy, which is impossible without ensuring the learning environment which would fit the needs of these graduates and promote their successful functioning in the multilingual and multicultural space.

Henze and Zhu (2012) have reviewed the data available in the academic literature on the problems and challenges Chinese students enrolled in the higher education programmes abroad face. They specifically highlight the language-related problems – both with the English language and a second foreign language they need to learn alongside with other problems (Henze, Zhu, 2012). Recent research (e.g., Weeks & Fugate, 2012; Smith, 2013; Baker, 2014, Druviete, 2014) reveals that the language issues introduced above related to the development towards the international learning space present challenges that go beyond the promotion, maintenance and elaboration of local language/ languages or second language acquisition and learning of a foreign language (FL) and developing a sufficiently high proficiency in the FL in question. There are other aspects which need to be explored and critically analysed in the effort towards the development of the international HEI (Higher Education Institution). These are, most pertinently, the cultural backgrounds of students as well as educators and other parties involved in the education process. In other words, in an international HEI, the main objective for every individual involved in the process is to learn to navigate in the transforming environment of the country and culture in which the HEI is situated. This type of environment is frequently termed *Multilingual and Multicultural Learning Space* (Stavicka, 2015).

Research Methodology

The theoretical and empirical project framework was developed in the pragmatic paradigm applying mixed-method research (MMR) strategy utilizing both quantitative and qualitative research methodology in accordance with the core idea of the approach. The multi-strategy (mixed-method) (Robson, 2011) approach to research project design is chosen, as to achieve the research aim, a substantial element of qualitative data collection as well as a substantial element of quantitative data collection are necessary. The chosen approach is appropriate for it allows to both combine research methods and use more than one research strategy. The mixed method research (established for more than 50 years) has gained an increased interest and

is commonly used in the field of education research. Within the pragmatic paradigm, which underlies the chosen methodology, the utilization of MMR serves as a framework, which uses both qualitative and quantitative methods to address distinct specific questions to contribute to the same overall goal of the project "Multilingual and Multicultural University: Preparation Platform for Prospective International Students". Within the MMR study designed, the combination of qualitative and quantitative data from different samples of respondents (e.g., Chinese students, lecturers and education experts collected at Beijing International Studies University (PRC) in March, 2018; international students of diverse linguistic and cultural backgrounds; lecturers, education experts at Latvian, Turkish and Lithuanian HEIs) to address a single goal, combining qualitative and quantitative evidence is being applied considering both data sets in an integrated approach. MMR allows to study the phenomenon of internationalisation from different perspectives combining the rich insights on the complex phenomena from qualitative study, with the standardized, generalizable data generated through quantitative research allowing to resolve the provisional challenges rooted in the weaknesses of each approach.

Within the study, narrative analysis was applied as a research strategy. Two types of narratives provided by BISU students in the year 2018 were processed, analysed and interpreted in accordance with the codes: *power distance, individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance, long- or short-term orientation and indulgence vs. restrain,* derived based on the Hofstede's cultural dimensions theory (Hofstede, 1984; Hofstede et al., 2010). Since the teachers and students used the English language as the medium language in their daily and classroom communication and the level of the English language proficiency was sufficient to complete the task, students provided their feedback in English. In accordance with the aim of the research, in total 26 students provided 52 narratives on their personal opinions on their studies and well-being, as well as on their evaluation of the teaching/ learning process stating all the aspects helping them to learn the new foreign language and all the obstacles hindering the learning process.

The present article reports the selected results obtained in the framework of the narrative analysis applied as a research approach within the broader methodological framework.

Research Sample and Setting

The implementation of The Belt and Road Initiative (BRI) by the government of People's Republic in China (PRC) substantiates the need for professionals with the sufficient knowledge of the Latvian language. The introduction of the Latvian language as a foreign language to Chinese

students dates back to 2011 when the first comprehensive programme on the Latvian language and culture studies prepared by the Latvian Language Agency as an elective course was launched in Beijing Foreign Studies University (BFSU) in the PRC. Since then another university – Beijing International Studies University (BISU) – introduced the programme with the Latvian major in 2015.

According to data provided by the Ministry of Education of the People's Republic of China (n.d.: http://www.moe.gov.cn), in September 2015 BISU launched the experimental programme "Beijing Municipal Commission on 7-Year Education Programme of Beijing International Studies University. The Latvian Language and Culture Programme". Twenty high school students representing different districts of Beijing were selected to enrol in the programme and relocate to BISU campus. The curriculum of the "7-Year Education Programme" presupposed the study of the Latvian language and the subject titled "National Conditions of Latvia" for 2 years in BISU alongside with general high school subjects in accordance with the National Education Standard for PRC. Alongside the intensive Latvian language courses, during the study years in Beijing, the students of the 7-year programme are expected to complete the courses in accordance with the following curriculum: Chinese Language and Culture, Maths and Logical Thinking, Personal Development, Fundamental English, Oral English, Ideology and Politics, Chinese History, Chinese Geography, Physical Education and Health Education, Artistic Performance, Social Activities/ Extracurricular Activities/ Professional Internship (BISU, 2019[a]). Upon the completion of the first stage, one year of the Latvian language study programme (120 ECTS) comprising such subjects as: History of Latvian Culture, History of Technical Sciences, Functional Communication, Latvian as a Research Language, Introduction into Academic Studies and Research Work, Academic Writing, Basic Grammar Course, Studies of the State Language, English Language, Functional Stylistics of the Latvian Language, Intensive Latvian Language Course, Latvian for Part-time Students, Latvian for Foreign Students, Latvian Language Communication Culture, Latvian Lexicology, Analytical Reading in Latvian, Introduction to Linguistics, Communication Theory and Practice in Latvian, etc. had to be completed in Latvia (RTU, n.d.). Upon the completion of the study year in Latvia, the students had to go back to China to gain the graduation certificate of vocational education equal to high school diploma (Beijing Education Committee, 2018) and return to Latvia for 3 years to obtain a bachelor degree related to one of the study fields within the Latvian language studies (e.g. Technical Translation Programme) (RTU, 2013). So far, the three afore-mentioned stages of the programme have been piloted. In September 2019, the students are expected to go back to Latvia to complete the final stage of

the programme, namely, get enrolled in the bachelor study programme and complete the chosen degree programme.

In 2016 a new bachelor programme "The Latvian Language and Literature" was launched in BISU (BISU, 2019[b]). Fourteen students formed the first intake on the basis of China's National College Entrance Examination (*Gaokao*) (Xinhua, 2017). In 2017 the second group of 12 students enrolled in the same programme.

The curriculum of BISU undergraduate programme "The Latvian Language and Literature" is as follows (BISU, 2019[b]):

• during the first study year students study the following subjects: Basic Latvian Language I, Basic Audio-Visual Latvian Language I, National Conditions of Latvia, Basic Latvian Language II, Basic Audio-Visual Latvian Language II;

• during the second study year the following courses are delivered: Intermediate Latvian Language I, Intermediate Audio-Visual Latvian Language I, Latvian Folklore, History of Latvia I, Intermediate Latvian Language II, Intermediate Audio-Visual Latvian Language II, History of Latvia II and Latvian Culture;

• during the third study year students have to complete the programme "Technical Translation" (2nd study year for international students) conducted by the Faculty of E-Learning Technologies and Humanities at Riga Technical University in Riga, Latvia;

• in the fourth study year in BISU, Beijing, China, students are supposed to complete the following subjects: Latvian Press Readings, Latvian Literature I, Latvian Literature II, Latvian Translation, Chinese Culture in Latvian Language and to develop a thesis (BISU, 2019[b]).

All the subjects are delivered by the teaching staff from Riga Technical University, each year having 2 to 3 teachers. Studies are conducted in the Latvian, English and Chinese languages based on the teachers' professional expertise.

Results and Discussion

The narrative analysis of the data provided by 26 students gives the insight to the patterns Chinese students use for foreign language learning. The codes were derived based on the Hofstede's cultural dimensions theory (Hofstede, 1984; Hofstede et al., 2010): power distance, individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance, long- or short-term orientation and indulgence vs. restrain.

The *Power Distance* scores for China (80) provide the information on the dependence relationships (Hofstede et al., 2010: 57) in the country

revealing the obvious dependence of students on educators, which is confirmed in the narratives provided by the respondents (e.g., *"we don't dare to question teachers in classes"*). Given that Latvia scores 44 for this dimension, the clear tendency towards the more limited dependence of students on educators may lead to the challenges for educators to meet the needs of this particular target audience. Moreover, Latvian educators may consciously or subconsciously be ready to deal with students questioning and challenging their educators, while not being able to respond to "the need for dependence well established in the student's mind" (Hofstede et al., 2010: 69). Given that the education process in the high-power distance countries is generally teacher-centered and students are used to following strict orders (ibid.), it may not be easy for them to adjust to the Latvian education settings predetermining the necessity to be more active and autonomous.

To proceed, China and Latvia can be found on the opposite poles in the *Individualism vs. Collectivism* dimension scoring 20 and 70 respectively (Hofstede et al., 2010), which leads to the necessity for Latvian educators to review their teaching strategies and practices taking into account that students from collectivist countries may view themselves as part of the group, which affects their behavior and activities in the classroom (e.g., *"The "one by one" method of asking questions in the classroom. Because when someone is being asked, he is nervous… and just manage to pass? And other people will [be] distracted observing the process…"*, *"I think you might feel confused all the time wondering why we are so quiet in class and don't answer sometimes. The reason isn't the language only – it is the character, and also about the education we received before"*, *"When it comes to speaking, the words are all gone"*, *"it is still uncomfortable for me to talk in front of many people"*). It is also crucial to highlight that within the individualist culture classrooms, "speaking one's mind is a virtue"(Hofstede et al., 2010: 107), while for collectivist cultures sharing feelings and emotions is challenging (e.g., *"To describe what I want to be or what I think of the class? I don't want to do it. Because that is something which is always in my heart and it doesn't need to be spoken out and cannot be spoken out"*, *"We just need time to open ourselves"*). Other important concepts related to collectivist society identified in the narratives were *shame and face* which stand for "the proper relationship with one's social environment, which is as essential to a person (and that person's family) as the front part of his or her head" (Hofstede et al., 2010: 110), for instance, "*Chinese are always stubborn and use some foolish ways to learn a foreign language*", "*we face some a little embarrassing situations in class*", "*what I can do is just to accept this*", "*ashamed of myself*", "*I have many shortcomings*", "*I am too shy*"). Another significant difference is that within the collectivist cultures, patriotism is the ideal (Hofstede et al.,

2010: 30) (e.g., *"There are many delicious Chinese dishes in our canteen"*, *"you are going to learn Chinese, it's my honour to help"*, *"to find a way to make a strong connection between Chinese culture and Latvian culture"*, *"we can improve our relation by eating and talking together"*, *"I can do something to make Latvia and China good friends in the future"*, *"try more Chinese food and get happiness there"*, *"to pay back to the country in the future"*, *"it is a rarely used Chinese character which means "versatile"*).

Given that in the individualist societies, such as Latvia, the purpose of receiving education is more focused on "learning to cope with new, unknown, unforeseen situations" and finding one's place in the society (Hofstede et al., 2010: 118), the goals students coming from collectivist countries put forward for themselves within the education process may be completely opposite. The data obtained from the respondents confirms that the role of diplomas for the members of collectivist societies differs from that of individualist one revealing that for Chinese students it is "a ticket to a ride" (Hofstede et al., 2010: 119) rather than the need for self-respect rooted in the ability to master a subject and gaining the sense of achievement (ibid.) (e.g., *"that is […] the Chinese exam-oriented education"*, *"high mark in test", "I care about grades too much" "to achieve better results"*, *"I think my goal is specific and measurable", "put strong focus and effort into completing my homework", "hard practice day by day"*).

As concerns the dimension *Masculinity vs. Femininity*, Latvia with the score 9 and China scoring 66 also have significant differences which have to be managed within the multilingual and multicultural classroom. Students from more masculine countries such as China may be willing to take exams again and again until they receive the acceptable or the highest grade possible (Hofstede et al., 2010: 161), while Latvian students may not always strive for excellence (e.g., *"I think because of the different traditions and differences between our countries, sometimes foreign teachers don't really understand why Chinese students pay much attention to exams and grades, …"*). Even though the collectivist norms put limit on open competition with each other (ibid.), failing is viewed as a very serious incident (e.g., *"my future"*, *"GPA* [grade point average] *is really important for me"*). It is also crucial to highlight that within the feminine societies such as Latvia, these are the educators' social and communication skills and the ability to build friendly classroom atmosphere – which are of primary importance, while in the masculine cultures – this is the correlation between educators' excellence and students' academic performance given that the masculine society is highly success-driven.

The scores for the dimension *Uncertainty Avoidance* reveal that Latvia scoring 63 and China with the scores 30 may have certain differences in the students' learning habits and different expectations as regards

the learning process organization. Within this dimension, the stronger uncertainty avoidance cultures such as China generally give preference to structured learning situations and less space given to creativity and freedom, which has already been highlighted in the analysis of the data for the *Power Distance* dimension. The Chinese students in the Latvian classroom may expect the educators to have all the answers and to be the leaders within the education process, while the Latvian educators may be implementing their professional practices based on their strive to develop the autonomy and creativity of their students (e.g., "*Unlike the traditional method we use here in China, you show us a completely different way of language learning*", "*I can recite but I still can't use these things well*", "*if only we could review what we have learnt more*", "*learn new words by reading texts*", "*give us some example sentence, we can memorize these examples*", "*I hope the class could focus more on memorization before they have enough accumulation*").

Within the dimensions *Long-Term vs. Short-Term* and *Indulgence vs. Restrain*, Latvia (scores 69 and 13 respectively) and China (scores 87 and 24 respectively) (Hofstede et al., 2010) appear to be on the same pole, which points to similar tendency towards the focus on persistence, perseverance and long-term success, which has direct correlation with less attention and time given to leisure and effort invested in hard work to achieve long-term goals (e.g., "*Keep learning is the most perfect answer.*", "*put strong focus and effort into completing my homework*", "*hard practice day by day*", "*I want to challenge myself*").

To conclude, different value patterns and cultural peculiarities lead to challenges rooted in differences in values related to power distance, individualism vs. collectivism, masculinity vs. femininity, uncertainty avoidance, long- or short-term orientation and indulgence vs. restrain. These differences have significant impact on the classroom interaction between the educator and the students of diverse cultural backgrounds as well as among students themselves. Apart from the immediate necessity to raise the awareness of both educators and students of the need to explore the diversity of world cultures, the issues of language proficiency and foreign language proficiency specifically as the key tool for communication have long been placed to the fore within the education research and practices. Sufficient language proficiency level leads to more effective integration in the multilingual and multicultural learning space. It is apparent that there are many more aspects to be explored to resolve intercultural problems within specific contexts, therefore, further research will address differences in institutional practices, differences in cognitive abilities as well as teaching methodologies, etc.

Conclusion

The article explored the narratives of 26 Mandarin Chinese speaking students in Beijing International Studies University on their Latvian language learning patterns and their attitudes towards the learning process. The findings of the study can contribute to the development of the guidelines for the integration of students of Asian origin into Latvian higher education space providing the insight to the needs of this particular target group while studying abroad.

The study revealed the strong connection between the native language and cultural background of the students with their foreign language learning patterns. In the process of the Latvian language learning students rely on the patterns within their traditional education culture, such as collectivism and teacher-orientated class routine, working in team for achieving goals, taking exams as the stimulus for studies, deep respect towards the nation and acknowledgement of the personal impact on the achievement of the common goal. The students give preference to acquiring the new knowledge through memorizing and reciting.

The selected research findings will form the basis for further exploration of the phenomenon of higher education internationalisation and the peculiarities of the integration of specific target groups (e.g. the international students, particularly Mandarin Chinese speaking students of Asian origin) in the multilingual and multicultural learning space.

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TEAM-BASED LEARNING IN BUSINESS ENGLISH IN LATVIA AND EU

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ABSTRACT

Business English is among of the core subjects in business education. The application of pertinent teaching-learning approach, such as team-based learning, allows students to engage into educational process and to demonstrate higher achievements in discipline acquisition. The article reflects the results of 4-year empirical research on team-based learning implementation in Business English in several higher institutions in Latvia, where participated 298 students, who mastered their skills and competences reaching an academic success through this approach. As well the article investigates the results of empirical research on team-based learning application in other European Union universities by Business English teachers from Germany, Austria, Slovenia, Italy, Spain, Greece and France. Team-based learning in teaching Business English proved to be a successful tool as it assisted to academic success in discipline, communication and understanding of the business environment peculiarities through teamwork and critical thinking and majority of students gave positive feedback. The research demonstrated that team-based learning gives more freedom and authorizes students to be more responsible for their own studies and knowledge as the process involves both individual work and teamwork and the contribution to the team is significantly important there. Self-determination in studies leads to an academic success towards life-long competences and proves team-based learning approach to be a useful and transformative tool for teaching Business English. However, in spite of this, the results of research demonstrated the team-bases learning approach is not familiar in EU universities, although other approaches are broadly applied.

Keywords: team-based learning, Business English, EU universities, educators, transformative learning.

Introduction

There is a common feeling that "learning is a change process of societies and individuals" (Bourdieu, 1990), the ability to change the society and individuals is dependent on learning process properly arranged by the educator. The nowadays learning process even being smoothly adjusted to the needs of society in theory, in real educational practice is far from

ideal. The peculiarities of the modern adult learning are tightly connected with the need to educate the capable workers. Thus, it is obvious that learning should be carefully planned and implemented by the educator to assist the learners in their studies to lead them to their academic achievements and in training their skills for lifelong. The entire skills for lifelong learning include the acquisition of higher level cognitive skills, ability to learn independently and be self-determined in learning in lifetime, ability to apply the course content in other various complex situations and on top of this – the ability to communicate and collaborate in teams, i.e. practical activities supported by group discussion form the core of such pedagogical practices" (Merriam and Caffarela, 2007, p.262).

Team-based learning (TBL) is such a concept in the 21st century pedagogy, which allows educators as to lead students to academic achievements as well as to train them in their skills for lifelong (Branney and Priego-Hernandez, 2018; Wu et.al, 2018; Simonson, 2014; Betta, 2016; Liu and Beaujean, 2017; Balan et.al, 2015; Huggins and Stamatel, 2015; Imazeki, 2015; Stein et.al, 2016; Bouw et.al, 2015; Yoon, 2014). TBL incorporates various theories of adult learning, such as cooperative theory (May and Doob, 1937), theory of margin (McClusky, 1970), three dimensions of learning model (Illeris 2004), model of learning process (Jarvis, 2004), lifelong and self-directed learning (Tough, 1967), transformational learning (Mezirov, 1991) and pedagogies of engagement (Edgerton, 2001) (Nagaswami, 2011) and allows students to advance their knowledge and skills through accommodative or transcendental learning. Team-based learning is a special approach to the use of small groups that take both teaching and learning to a whole new level of educational significance (Fink, 2002, p.4). When using properly TBL as a constructivism didactic model, it drives 4 kinds of transformation:

1. It transforms small groups into teams;
2. It transforms a technique into a strategy;
3. It transforms the quality of students' learning;
4. It transforms the joy of teaching (for teachers).

There are two major distinctive features: (a) teams, instead of groups, and (b) strategy, instead of technique. TBL is a particular instructional strategy that is designed to support the development of high-performance learning teams and to provide opportunities for these teams to engage in significant learning tasks (Fink, 2002, p.9). Being an instructional strategy, it provides a set of learning activities in a particular sequence, which work synergistically to create a high level of energy on the part of the students that can be applied to the task of learning. When implemented properly, a good strategy can generate a very powerful level of educational energy. In order to use TBL, a course has to satisfy two conditions:

1. The course should contain a significant body of information, it means the content of the course should be meaningful for the students (it emphasises constructivism background of TBL);
2. The main goal of the course – students have to learn how to apply this context by solving problems, answering questions, resolving issues successfully applying higher level cognitive skills in the new context.

In order to build high performance learning teams in TBL, the teacher should arrange the following conditions:

1. Form the groups properly, i.e. groups should be diverse (in the frames of this research as in language level, as in other issues, as gender, race, ethnicity, previous knowledge, work experience, personal characteristics etc, what is defined on the first lesson via pre-course questionnaires);
2. Keep the groups together during the term to give a chance to become cohesive;
3. Constantly give challenging tasks with prompt and clear feedback (as it happens after Readiness Assurance Tests, which teachers gives students at the beginning of every new theme and application exercises).

These conditions, which fit constructivist didactic model where the role of the teacher is mostly as a facilitator, allow students to learn the content, to learn how to use the content, to learn about themselves and how to interact with each others on major tasks and what is more important how to keep on learning after the course is over (Fink, 2002, p.9), and what is particularly important for lifelong learning – it teaches the self-directness and self-determination in studies.

The aim of the article is to reflect the results of 4-year empirical research on team-based learning implementation in Business English in several higher institutions in Latvia, where participated 298 students, who mastered their skills and competences reaching an academic success through this approach and to investigate the results of empirical research on team-based learning application in other European Union universities by Business English teachers from Germany, Austria, Slovenia, Italy, Spain, Greece and France.

Methodology

The paper focuses on illustration of team-based learning implementation in Business English course in Latvia in 4 various institutions in the frames of PhD research. The research was conducted from September 2015 till May 2019.

The participants of the empirical research in Latvia were:
- 127 first-year undergraduate students from the Faculty of Management, Latvian Business College
- 90 first and second-year students from the Faculty of Education and Faculty of Management, Riga Teacher Training and Educational Management Academy
- 25 first-year undergraduate students from the Faculty of Business Administration, Management College
- 56 first-year undergraduate students from the Faculty of Education and Faculty of Business, Management and Economics, University of Latvia;

Totally **298** participants, age was from 18 to 52 years old. The differentiation of participants by age is indicated in the Table 1.

Table 1. Differentiation of participants by age

< 20	20–25	25–30	30–35	35–40	40–45	45–50	50–55	Not indicated
10%	37%	22%	10%	6%	4%	2 %	2 %	7%

As it is seen from the Table 1, the majority of participants were presented in the age gap from 20 to 30 years old, followed by age gaps from 30 to 40 years old.

The differentiation of participants by English Language Proficiency level is given in Table 2. varies from Level A to C.

Table 2. Differentiation of participants by English Language Proficiency level

A1	A2	B1	B2	C1	C2	Not indicated
12%	24%	36%	19%	5%	1%	3%

It is clear, that THE majority of participants obtain A2-B1 level, A2 is not high enough to be able to study Business English easily.

In order to ensure the objectivity and validity of the research data, the following materials and documents were analyzed:
- 298 pre-course questionnaires to students from Latvia;
- 277 post-course questionnaires to students from Latvia;
- 8 questionnaires to educators (Germany, Austria, Slovenia, Italy, Spain, Greece and France);

- 20 in-depth interviews to students from Latvia;
- 8 in-depth interviews to educators (Germany, Austria, Slovenia, Italy, Spain, Greece and France);
- 9 focus groups (Latvia);
- Lessons observations.

In the groups taught in Latvia were as local students as the students, who represented different foreign countries – India, Lebanon, Brazil, Nigeria, Sri Lanka, Uzbekistan, China, Kazakhstan, Russia, Ukraine, Cameroun.

Humanists (Pearson and Podeschi, 1999, Maslow, 1968; Rogers, 1969, Knowls, 1980, Swanson and Holton, 2005, Leonard, 2002), constructivists (Merriam and Caffarela, 2007; Doll, 1993; Fosnot and Perry, 2005; von Glasersfeld, 1995; Arnold, 2005; Patzold, 2011) as well as social learning theories (Rehrl & Gruber, 2007; Belanger, 2011; Lave and Wenger, 1993; Michaelsen, 2014) were applied within the frame of this research.

The hypothesis of the research – team-based learning is appropriate to achieve the desired quality of learning and learners' achievements in skills for life-long learning. The following criteria were formulated to measure the students' achievements:

1. knowledge of Business English;
2. ability to work in a team;
3. acquisition of higher-level cognitive skills;
4. ability to learn independently and be self-determined in learning in lifetime;
5. ability to apply the course content in complex situations.

Findings

To investigate the outcome of TBL application in teaching business English according to the settled criteria, the analysis of the pre-course questionnaires, post-course questionnaires, focus groups and in-depth interview was made. The pre-course questionnaires included 13 open questions, the post-course questionnaires included 15 Likert scale questions and five open questions. The pre-course questionnaires were distributed at the beginning of the first lesson, the post-course questionnaires were distributed at the end of the last lesson of the course. All students simultaneously had to complete the printed questionnaires and submit it simultaneously at the end of the lesson. After that some groups were asked to stay and discuss the post-course questionnaires. The focus groups were formed from the students who participated in the course and completed both questionnaires. They were sitting in the circle and one by one discussed the questions from the questionnaires, explaining and commenting on their answers.

The students who were taught by TBL in Latvia expressed their interest and satisfaction of this method – 'the method was great', 'I was very peaceful to come to your lessons', 'it is helpful', 'I find it interesting, something what we did not have before', 'it improves our knowledge', 'we were really into the working, discussions', 'we felt calm, positive, relaxed, excited a little bit, because we were not get disappointed', 'it let me feel more free and open-minded', 'I felt interested'.

They confirmed that TBL improved their 'communication', 'listening by listening to each other', 'vocabulary by listening to peers and picking up new words', 'grammar by understanding the mistakes of others'.

The analysis of the outcome of the TBL approach in Business English measuring the students' achievements according to the established criteria is presented in the following graph (Figure 1).
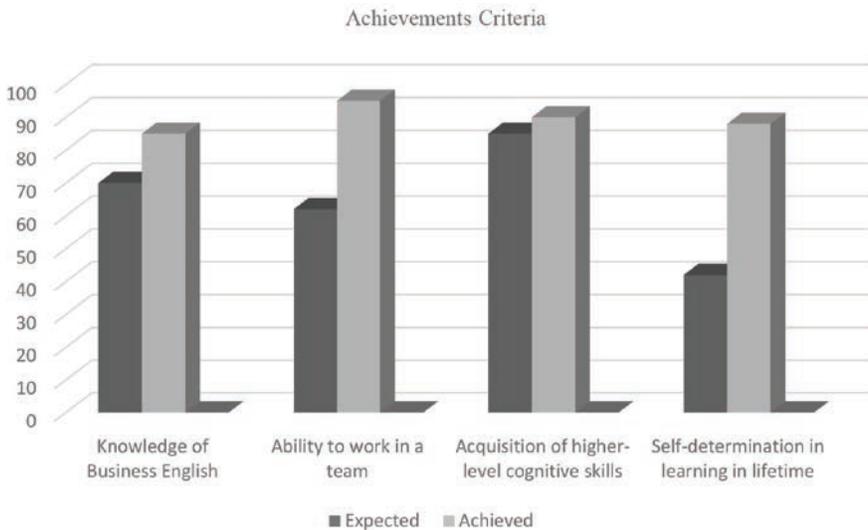

Figure 1. Analysis of TBL outcomes in Business English

Analyzing the results presented in Figure 1, it is possible to conclude that:

- 85 % of students agree that the lessons, where TBL approach was used facilitated to their BE knowledge improvement (reading, listening, speaking, writing);
- 95% of students believe that the lessons increased their ability to work in teams;
- 90% confirm that the lessons improved their higher-level cognitive skills;

- 88% of students agree that the lessons facilitated their self-determination in learning.

Thus, it is possible to sum up that by opinion of the students themselves their knowledge of Business English, ability to work in teams, acquisition of higher-level cognitive skills and development of self-determination in leaning in lifetime have progressed and improved in comparison with their expectations. They acknowledged that being taught by TBL they were able to master not only English knowledge but also acquired higher level cognitive skills, got an ability to learn independently and be self-determined in learning in lifetime, learned how to apply the course content in complex situations via communication and collaboration in teams. What proved team-based learning in teaching Business English to be a successful tool as it assisted to academic success in discipline, communication and understanding of the business environment peculiarities through teamwork and critical thinking. The research demonstrated that team-based learning gives more freedom and authorizes the students to be more responsible for their own studies and knowledge as the process involves both individual work and teamwork and the contribution to the team is significantly important there.

As this paper represents the definite stage of PhD research, it also investigates the results of empirical research on team-based learning application in other European Union universities by Business English teachers from Germany, Austria, Slovenia, Italy, Spain, Greece and France.

- **Germany:**University of Wurzburg, Faculty of Business Management and Economics;
- **Austria:**University of Vienna, Faculty of Business, Economics and Statistics;
- **Slovenia:**University of Ljubljana, Faculty of Economics;
- **Italy**: University of Florence, School of Economics and Management and University of Padua;
- **Greece**: University of Cyprus, Language Centre;
- **France**: University of Toulouse, School of Economics;
- **Spain**: University of Gerona, Centre of Modern Languages.

The choice of the Universities was random and it was connected with the willingness of the respondents to meet and to contribute to the research. The main purpose was to interview Business English language teachers to familiarize with their experience in teaching Business English. The method of triangulation was applied through questionnaires, interviews and observations.

Within the research were investigated: students English level, language teaching experience and approaches in teaching English, knowledge about

team-based learning and its application, expected outcome and students' achievements from their BE course.

The Business English level of the students in the aforementioned Universities differs (see Figure 2), A2 (2 answers), B1 (3 answers), B2 (5 answers), C1 (4 answers), C2 (2 answers), thus, the majority of teachers teach groups with level B2-C1, which is high enough for team-based learning approach application.

It shows that the average level in other EU countries is higher than in Latvia, which makes it easier to teach Business English and to apply as TBL as any other communicative approaches.
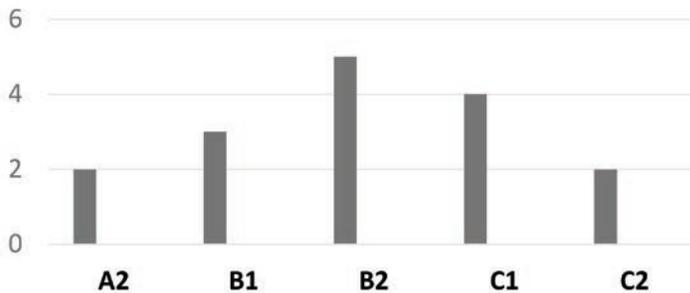
Figure 2. English Language Proficiency level in EU Universities

Having analyzed the teachers' language teaching experience and approaches in teaching English, as well as knowledge about team-based learning and its application, it is possible to make a conclusion that none of the interviewed teachers heard about TBL approach and consequently did not use it in lessons. However 75% of them (6 out of 8) replied positively on the question how they organize TBL, ("in every class", "every other lesson", "yes, during the semester I assign team-based assignment", "with a group and team activities", "yes, as often as possible with case studies/ simulations of meetings. At a lower levels smaller teams (2–3, at higher levels in bigger (5–6)). These answers make it possible to conclude that they all suppose that TBL is an equivalent to group-based learning, and that they do not fully realize what TBL is and how it differs from group learning or collaborative learning. The other two teachers who answered negatively, expressed their regret not using it and willingness to use it ("not at all, I would be willing to try, though"), as they are not aware of what it is, as answering the question: "How do you organize TBL?" the teacher mentioned that "it depends on the task and how many will form the teams. Sometimes, the students can choose their own teammates, sometimes I assign or it is random".

Answering the question: What is your opinion on the TBL, it is also possible to draw a conclusion that there are more positive feedbacks of this approach (75%), as among the answers were "one excellent way to share and create skills for the students", "it is a positive experience for students and I use it in a lot of classes but I have my doubts about using team-based exams", "very positive", "my students do simulations of meetings and presentations in teams/groups. Learning in teams has some downsides (time-consuming, free-riders, mother tongue discussions), but there are also some upsides (peer learning, flexibility, interest, motivation).

On the other hand, in spite of the majority of the teachers claim they apply team-based approach, answering the question, which approach in teaching English they use, the answers differed, it means that teachers use all mentioned approaches, mixing and combining them in their course, what stands out, that 3 teachers acknowledge the use of teacher-centred approach, however at the same time they use student-centred approach too. Those teachers, who do not use teacher-centered approach, tend to combine different approach, creating the eclectic methods, involving games, projects, problem solutions but anyway targeting the student, who is in the centre. See the chart below (Figure 3).
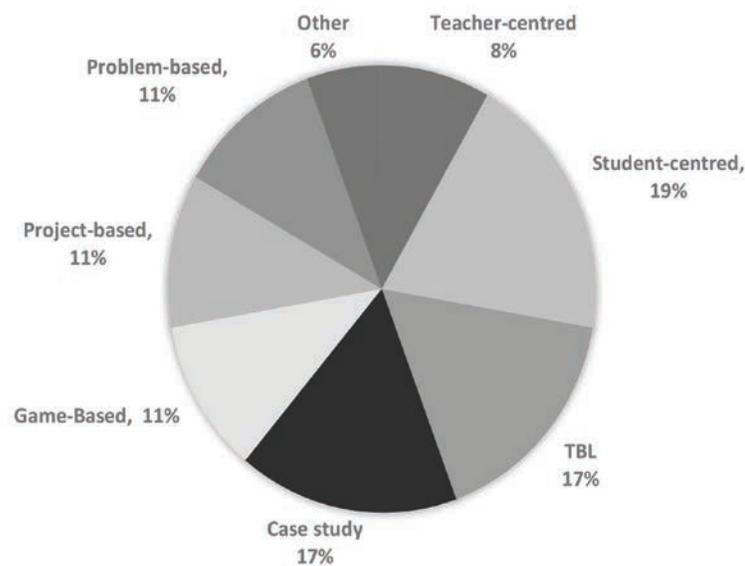

Figure 3. Approaches Used in EU Universities in BE

It is obvious that the most popular approach is student-centered, team-based and via case studies, however as it was mentioned earlier TBL approach is rather group-based.

Among the achievements, which teachers expect from their students were indicated 12 skills, the main are represented in the chart (Figure 4)
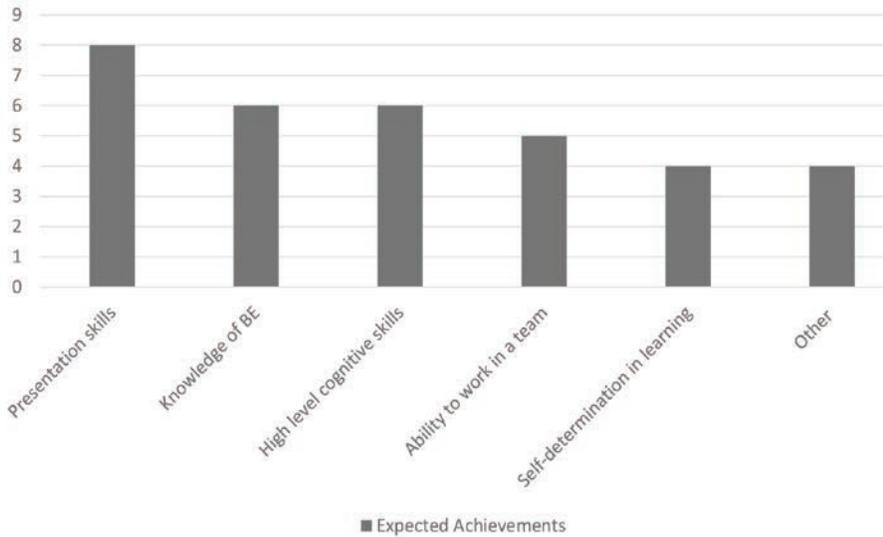

Figure 4. Expected Achievements in BE in EU Universities

Analyzing the expected achievements in Latvia (by students) and in EU universities (by teachers), it is possible to conclude that the main achievements are similar – knowledge of Business English, ability to work in a team, acquisition of higher-level cognitive skills, ability to learn independently and be self-determined in learning in lifetime. However the priorities differ insignificantly, for instance, presentation skills (absolutely all teachers mentioned ''presentation skills'' – 8 out of 8) which in Latvia are not prioritised at all in EU Universities are on the first place, also in other EU Universities teachers focus more on business vocabulary, on skills how to conduct the negotiation and chair the meetings. It means that all the aforementioned skills are considered by the teachers as valuable and reasonable to pay attention at the lessons, however with priority to business area (business vocabulary, presentations, negotiations, meetings). It is worth mentioning that some teachers added their own variants of achievements, which they expect:

- "To succeed at a job interview; to use politeness when communicate in English" (Cyprus)
- "ability to assess own progress, ability of accept own learning path, feeling confidence in speaking" (Girona)
- "foreign language communicative competences" (Ljubljana)
- "intercultural skills, soft skills" (Wurzbourg)

These additional skills provides deeper into understanding what are the real expectations from Business English course in other EU countries. Also, it emphasises more hard-skills development approach, rather than soft skills. Nevertheless, in general expected achievement all teachers are unanimous.

Trying to figure out more about the realizaton by EU teachers TBL approach, the following question was asked: How do you organize TBL? The answers again emphasized that the teachers perceive TBL as a group work: "it depends on the aims of the activity, some times put students together with very different experiences, other time with similar experiences", " in groups of 4 students", "for debates, presentations, for researching topics – seminar with whole group", "with good instructions, help in the preparation stage, time to prepare at home and do some research individually, by providing feedback before/during/after the activity, providing students with safe environment for communicating and learning, organizing work in several teams at the same time to enable the potential experiential learning and self-evaluation". It demonstrates that in general group learning or collaborative learning prevails in the Business English classes in EU universities.

Conclusions

Team-based learning approach is a useful and transformative tool for teaching Business English. However, in spite of its very positive application in institutions of Latvia, this method is not familiar to other European Business English Language teachers. Moreover, completely all teachers, who participated in the research, substitute the notions collaborative learning/group learning with team-based learning.

The reasons could be the following:
- lack of information about TBL among language teachers;
- lack of information about TBL in Europe in general.

Besides, it was possible to notice, that:
- teachers of BE gradually have been changing their teaching approach from teacher-centered to student-centered'
- -even if the level of English in EU universities allows to apply different methods, such as TBL including;
- -BE teachers focus mostly on preparation for real life situations.

In order to facilitate the expansion of TBL in BE in Europe, the following possible solutions are applicable:
- to support BE teachers with information about new approaches.
- to spread the word about TBL in particular.

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APPROACHES TO EMBEDDING GLOBAL DIMENSION IN ADULT EDUCATION CURRICULUM BY THE CASE STUDY OF THE HOSPITALITY BUSINESS TOOLKIT

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ABSTRACT

The purpose – The paper aims to present a conceptual overview of the approaches to embed Global Dimension in Adult Education Curriculum to learn and share global practices with adult educators and promote Education for Sustainable Development and Global Citizenship (ESDGC) for achieving the Sustainable Development Goals' targets including SDG4 Quality Education and overall enhancing education.

The theoretical framework – Global Dimension including the concepts of Sustainable Development and Global Citizenship is initially related to the subject-oriented approach, the principles of Education for Sustainable Development (ESD) as well as ESDGC including SDGs are based on the principles of the competences leading to competencies that point at competency-based and problem-based approaches, but the qualification competences frame to curriculum-based approach. This overview provides a summary of the approaches to embed Global Dimension in adult education curriculum with discussion of the benefits, applicability and synthesis of various approaches as well as practical case framework by the example of the Hospitality Business Toolkit, a course designed by Pearson, the Business and Technology Education Council (BTEC).

The research/ study design – The framework is developed from a review of literature on the principles, approaches and global practices of embedding Global Dimension, ESD, ESDGC in the curriculum, interrelated with the qualification learning outcomes.

The methods or instruments – The grounded theory, an exploratory method, was used for identification and conceptualization of the patterns to structure findings by the process of comparison of different approaches and practices. A case study was designed to demonstrate a practical application of optional embedding Global Dimension in the course design.

The description of the experience – The case illustrates the initially built-in concepts of Global Dimension by Pearson, BTEC by integrated legal, ethical and social, financial, human resource and department coordination aspects with additional optionally embedded sustainability topics in the course design.

The findings – The unity between the content, form and context with a synthesis of approaches to embed Global Dimension, ESD, ESDGC in the curriculum is of utmost importance.

Key words: Global Dimension, Education for Sustainable Development and Global Citizenship (ESDGC), embedding, approaches, learning challenges, hospitality.

Introduction

The paper provides a theoretical review and practical case study of the approaches to embed Global Dimension in the Pearson BTEC Unit the Hospitality Business Toolkit with analysis of the related aspects linked to ESD, ESDGC, the hospitality business manager competences leading to competencies and entrepreneurship skills.

According to McGough, Hunt,, (2012, p. 8), University of London, the global dimension connects the local, national and global in a way that people are aware of how their actions have implications for others across the globe. The term the global dimension can be used alongside other terms such as global learning, development education and global citizenship education (McGough, Hunt, 2012, p. 8).

Global Education Guidelines Concepts and Methodologies on GE for Educators and Policy Makers by GEGWG, the North-South Centre (NSC) of the Council of Europe (2012, p. 10) mention Global Education as an education perspective which arises from the fact that contemporary people live and interact in an increasingly globalised world.

Europe-wide Global Education Congress (2002, p. 2) defines GE as education that opens people's eyes and minds to the realities of the world, and awakens them to bring about a world of greater justice, equity and human rights for all, where the GEGWG (2012, p. 6) enriches the explanation of the definition by the word 'holistic education'.

Global Education by the Maastricht Global Education Declaration (2002, p. 2) is understood to encompass Development Education, Human Rights Education, Education for Sustainability, Education for Peace and Conflict Prevention and Intercultural Education; being the global dimensions of Education for Citizenship. In addition, GEGWG (2012, p. 20) admits that GE enables people to develop the knowledge, skills, values and attitudes needed for securing a just, sustainable world in which everyone has the right to fulfil his/her potential.

Bourn (2012) mentions that the concept of the Global Dimension was constructed in 2000 by development education organisations in partnership with the Labour government as a mechanism for taking forward many of the themes behind development education practice through a series of concepts such as sustainable development, conflict resolution, values and perspectives, interdependence. Qualifications and Curriculum Authority (2008, p. 2) states that 'the GD explores what connects us to the rest of the world. It enables learners to engage with complex global issues and explore the links between their own lives and people, places and issues throughout the world. The GD can relate to both developing and developed countries, including countries in Europe. It helps learners to

imagine different futures and the role they can play in creating a fair and sustainable world.'

Sustainable Development Goal 4 Quality Education (SDG4) of the 17 SDGs is to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (United Nations, 2015, "The 2030 Agenda for Sustainable Development"). The target 4.4 is 'By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship'. The target 4.7 is 'By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through ESD and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development'. The indicator to measure the target 4.7 is 4.7.1 the extent to which (i) global citizenship education and (ii) ESD, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment (United Nations, 2015, "The 2030 Agenda for Sustainable Development").

Research problem has been figured out that GD including the concepts of Sustainable Development and Global Citizenship is initially related to the subject-oriented approach, the principles of ESD as well as ESDGC including SDGs are based on the principles of the competences leading to competencies that point at competency-based and problem-based approaches, but the qualification competences frame to curriculum-based approach. The identified problem is the absence of clarity and framework for approach application to embed GD in Adult Education Curriculum with relation to Learning Outcomes and Qualifications.

Research background can be found in co-authored published article (2017) 'Key Competencies of Managerial Level Employees for Sustainability in Hospitality Business' and a conducted research and designed intellectual outputs on approaches to embed ESDGC in adult education for EU Erasmus Plus KA2 ESDGC Project. The updated Pearson BTEC Hospitality Management Programme 2018 was introduced and implemented instead of Programme 2010.

The Aim of the Research The paper aims to present a conceptual overview of the approaches to embed Global Dimension in Adult Education Curriculum to learn and share global practices with adult educators and promote ESDGC for achieving the Sustainable Development Goals' (SDGs') targets including SDG4 Quality Education and overall enhancing education.

Research Function and Application This overview provides a summary of the approaches to embed GD in adult education curriculum with

discussion of the benefits, applicability and synthesis of various approaches as well as practical case framework by the example of the Hospitality Business Toolkit.

Research Objectives are: to establish approach framework for embedding GD in Adult Learning Curriculum; to illustrate an approaches and techniques how to embed GD in Adult Curriculum by case design and analysis; to develop a proposal of methods and topics to embed GD in Adult Learning Curriculum.

Research Object is the approaches to embed GD in Adult Learning Curriculum.

Research Subject is the ways to select and apply approaches to embed GD in Adult Learning Curriculum to achieve Sustainable Development Goals including SDG4 Quality Education and enhance overall education.

Theoretical Framework

The framework is developed from a review of literature on the principles, approaches and global practices of embedding GD, GE, ESD, ESDGC in the curriculum, interrelated with the qualification learning outcomes.

Relation of Global Education, Global Dimension, ESD and ESDGC

The theoretical definitions and relation of Global Education, Global Dimension, ESD and ESDGC are reviewed to clarify the relevant approaches.

0GEGWG (2012, p. 10) states it is 'crucial for education to give learners the opportunity and competences to reflect and share their own point of view and role within a global, interconnected society, as well as to understand and discuss complex relationships of common social, ecological, political and economic issues, so as to derive new ways of thinking and action. At the same time GEGWG (2012, p. 10) defines *GE as approach* itself and ascertains that 'GE should not be presented as an approach that we may all accept uncritically, since we already know there are dilemmas, tensions, doubts and different perceptions in an education process when dealing with global issues'.

The Global Education Guidelines Working Group (GEGWG, 2012, p. 17) delineates that 'GE is a new approach which aims at enabling learners to understand world issues while empowering them with knowledge, skills, values and attitudes desirable for world citizens to face global problems. The global challenges and the theoretical pattern of GE are separated into a system of spatial, objective/issues, temporal, and social dimensions (Lehner, Wurzenberger, 2013, p. 361).

Mannion et al (2011, p. 448) discuss the concept by Davies, Evans, and Reid (2005), 'the Environmental Education (EE), Development Education

(DE) and Citizenship Education (CE) lineages potentially converging on a nodal point in their respective discourses' illustrated as Education for Global Citizenship. By Mannion et al (2011, p. 448), EE includes Nature Studies, Global Learning, ESD, the route of DE involves Third World Studies, Peace Education, Global Education, ESD, but CE emerge as Civic Studies, Entrepreneurial Education, International Education.

Global Dimension, GE, ESD, ESDGC are interrelated, the approaches to ESD are traceable with the focus on GD. Pedagogical approaches and principles that have been analysed by UE4SD (2014, p. 57) within national ESD strategies in the European countries include whole-of-institution, strategic/systemic, competence/skills-based, and future thinking. ESD principles by UE4SD (2014, p. 57) are critical/creative thinking, action learning, systemic thinking, participation/ partnerships.

GEGWG (2012, p. 20) determines that 'GE is not just concerned with different perspectives on globalised themes and what you teach and learn about them. It is also concerned about how you teach and learn and the contextual conditions in which you teach and learn. In fact there is a necessary unity between the content, form and context in which the learning process takes place.'

'Core values allow educators to clarify the basic principles of the learning process, guiding them in choosing the contents, identifying and using sources of information, designing teaching-learning-evaluating strategies and developing fields of practical intervention for the learner. The ultimate purpose of GE is to develop values, based on knowledge of global issues and relevant skills in order to build attitudes for responsible global citizenship at individual and collective level' (GEGWG, 2012, p. 24). The values include self-esteem, self-confidence, self-respect and respect for others, social responsibility, environmental responsibility, open-mindedness, visionary attitudes, proactive and participatory community membership, and solidarity (GEGWG, 2012, p. 24).

According to the Department for International Development (DFID), (2005, p. 7) the global dimension contributes to the development of key skills including communication, cross-cultural communication, working with others, and an awareness of diverse perspectives on issues. It contributes to thinking skills by encouraging pupils to analyse, evaluate, question assumptions; and creatively identify ways to achieve positive change.

Development Education Association (2000, p. 3) has outlined the eight principles of GD. The Department for International Development (2005, p. 20), specify that these concepts provide a conceptual framework for thinking about and building them into the curriculum: *global citizenship, conflict resolution, social justice, values and perceptions, sustainable development, interdependence, human rights, diversity*. The description of the principles

and the skills related are discussed in the case study of the proposal of embedding GD in the Hospitality Business Toolkit.

A Conceptual Overview of the Approaches to Embed Global Dimension in Adult Education Curriculum

As there is no united framework for embedding GD in adult curriculum, the concepts of embedding, infusion, mainstreaming related to GE, GD, ESD and ESDGC are reviewed as interrelated and integrated.

'While the term '*mainstreaming*', as in the global indicator of SDG Target 4.7, is commonly used to refer to a process of incorporating or including ESD in different aspects of education systems, we use 'embedding' intentionally to refer to a particular strategy for mainstreaming' (UNESCO MGIEP, 2017, p. 18).

UNESCO MGIEP (2017, p. 18) refer to Wals (2009, p. 49) that mainstreaming ESD into formal education involves different approaches, ranging from 'conventional' ones that conform to existing school systems and structures to 'innovative' ones where there is a radical force to transform existing institutional structures. 'Ideally, mainstreaming ESD should happen within a 'whole-school' approach, with ESD values and principles being reflected in the ethos and mission of the school and being central to the professional development of its teachers (UNESCO MGIEP, 2017, p. 18).

The metaphor of embedding describes the process of integrating a desirable element deeply into a system. *Embedding is a strategy* that opens up possibilities for transforming the education system from within by paving a way to an interdisciplinary curriculum, issue-based learning and whole-school approaches (UNESCO MGIEP, 2017, p. 18).

The metaphor of infusion, on the other hand, describes the process of a desirable essence permeating and transforming the milieu in which the system operates. Infusion is a strategy for ESD integration that is deeper than embedding and is an ultimate solution (UNESCO MGIEP, 2017, p. 18).

Embedding, therefore, strategically promotes double-purpose learning, where students acquire subject knowledge and skills and, at the same time, learn how to contribute to a sustainable transformation of society – they learn to live together with a deep respect for the environment and dignity for all (UNESCO MGIEP, 2017, p. 19).

One of the most important methodological approaches for understanding globalised themes is to track the same problems and issues at all these levels in order to constantly investigate the relationship between micro and macro context (The GE Guidelines Working Group, 2012, p. 21).

'*A holistic approach* seeks to understand direct and indirect relationships between forms of power, violence and injustice at all levels, as well as

the values, practices and necessary conditions needed to overcome them' (GEGWG, 2012, p. 30). Lehner, Wurzenberger (2013) state that 'GE provides *holistic learning strategies* based on the challenges of globalisation and a global society.

Dumitru (2017, p. 896) demonstrated how ESD principles and competencies can be integrated within its established curricular architecture by means of the method of infusion. The main focus of infusion or the embedding approach referring to Collins et al (1989), Ennis (1989), Perkins and Salmon (1989) is to include new competencies into an existing program and into existing subject matter, making the principles of the new corpus of knowledge explicit to the students. There are two other concurrent approaches, namely: (1) one which consists of adding a new course separately from other subject matters; the new course containing the new knowledge (the stand-alone approach); and (2) immersing the new knowledge into the existing subject matters, without making explicit to the students the principles and newness of the knowledge corpus (Dumitru, 2017, p. 896).

UE4SD (2014, p. 17) illustrates a comparative overview of ESD approaches and principles that are promoted in national strategies. The analysis is based on the three ESD approaches: competence/skill-based, strategic/systemic, whole-of-institution. Estonia, Ireland and Latvia are using only strategic/systemic approach, Lithuania and Hungary are using only competence/skill-based approach, United Kingdom and Greece are using the two approaches – whole-of-institution and competence/skill-based, but Cyprus use only whole-of-institution. Italy, Portugal and Spain are using whole-of-institution and strategic-systemic approaches. GEGWG (2012, pp. 30–31) determine the three methodological approaches to GE including cooperative-based learning, problem-based learning and dialogue-based learning.

The micro-macro approach mentioned by GEGWG (2012, p. 33) has the three forms. The first form is 'from local to global', the second form is 'from personal to collective', and the third form is 'from emotional to rational'.

Interdisciplinary approach discussed by GEGWG (2012, p. 33) suggests that 'global issues can be developed through any subject of the curricula, formal or non-formal'.

Sustainability and Environmental Education (SEEd, 2016) outlines *Whole School or Whole Institution Approach, also called Whole System Approach* (Sustainability and Education Academy, SEDA, 2016), which can be of the two categories: whole school engagement on a topic or practice and whole school approaches categorised by an ethos/vision and or a framework (Finalyson, 2016).

The recommended practices for GE by GEGWG (2012, p. 39) is the project method, the world-links method, international school partnerships, debate competitions, participative arts, community learning, learning to live together by, and sports.

Zhang et al (2016, p. 375) examined and demonstrated a Comparative Perspective of Competency-Oriented Diversity Education by contrasting the two approaches such as *mainstream diversity education approach* and *competency-oriented diversity education approach* to culturally and linguistically diverse international students (CLDI students). The competency-oriented diversity education approach ensures both inclusion and academic success, targets both nonmainstream domestic students and CLDI students, sets sustainability as motive: the changing needs and expectations of students with curriculum both informal and formal, and systematic curriculum transformation. The recommended pedagogy is identity-sensitive, particularism (different keys for different locks; individualized teaching); proactive learning relationship, and such learning outcomes as diversity awareness; mind-set shifts; host-country language proficiency; cross-cultural knowledge, skills, and abilities Zhang et al (2016, p. 375).

Zhang et al (2016, p. 376) state that OECD business schools may need to reform the traditional standardized course structure and explore the possibility of designing courses specifically to address CLDI students' special educational needs.

By Sweitzer (2019), the *subject-centered curriculum design* describes what needs to be studied and how it should be studied. Subject-centred curriculum design revolves around a particular subject matter or discipline (Sweitzer, 2019, 'Curriculum Design').

'*Learner-centred pedagogy* sees students as autonomous learners and emphasizes the active development of knowledge rather than its mere transfer and/or passive learning experiences. *Learner-centred approaches* require learners to reflect on their own knowledge and learning processes in order to manage and monitor them. Learner-centred approaches change the role of an educator to one of being a facilitator of learning processes' (UNESCO, 2017, p. 55 with reference to Barth, 2015).

In *action-oriented learning, action-oriented approach***,** learners engage in action and reflect on their experiences in terms of the intended learning process and personal development. The experience might come from a project (in-service learning), an internship, the facilitation of a workshop, the implementation of a campaign, etc. Action-learning refers to Kolb's theory of the experiential learning cycle with the following stages including 1) having a concrete experience, 2) observing and reflecting, 3) forming abstract concepts for generalization and 4) applying them in new situations' (UNESCO, 2017, p. 55 referring to Kolb, 1984).

'Action-learning increases knowledge acquisition, competency development and values clarification by linking abstract concepts to personal experience and the learner's life. The role of the educator is to create a learning environment that prompts learners' experiences and reflexive thought processes' (UNESCO, 2017, p. 55.).

'Problem-centered curriculum design, *problem-centred approach,* is also a form of student-centered design. Problem-centered curricula focus on teaching students how to look at a problem and come up with a solution to the problem. Students are thus exposed to real-life issues, which help them develop skills that are transferable to the real world' (Schweitzer, 2019, 'Curriculum Design').

UNESCO (2009, p. 4), mentions *competency-based approach* for ESD. 'A global vision of curriculum should include learning outcomes to achieve (exit profiles), pedagogical and instructional strategies linked to teaching and learning, teaching materials for teachers and students, the discipline's contents, evaluation of learning outcomes and achievements, and curriculum management.'

A competency-based approach can be a valid alternative to the notion of a curriculum as a plan of studies, providing an innovative way of conceiving and organizing the curricular structure and objectives, discipline-contents, to develop people who are competent as autonomous, critical and assertive citizens (UNESCO, 2009, p. 4).

An interdisciplinary approach engages students meaningfully in sustainability issues by allowing them to analyze a complex topic in more than one subject (UNESCO MGIEP, 2017, p. 24).

UNESCO (2017, p. 55) mentions transformative learning, *transformative learning approach,* which can best be defined by its aims and principles, rather than by any concrete teaching or learning strategy (UNESCO, 2017, p. 55).

Entrepreneurial Education Approach

Based on the Hospitality Business Toolkit competences set up by BTEC and on the Sustainable Development Goal 4 and its target 4.4 'By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship' (United Nations, 2015, "The 2030 Agenda for Sustainable Development"), the approaches to teaching and learning entrepreneurship are reviewed.

Lackéus (2015, p. 9) states being entrepreneurial can mean many things to many people, and discusses that a common conception according to Gartner (1990), that entrepreneurship is about entrepreneurial individuals creating innovative organizations that grow and create value, either for

the purpose of profit or no, entrepreneurship does not have to include the creation of new organizations, it can also occur in existing organizations (Shane and Venkataraman, 2007).

A learning-by-doing approach as fosters habits of learning by default through its deep learning component. It also promotes initiative and responsibility, since it encourages people to take initiative to inter-action of the kind that leads to meaningful outcomes, sometimes even valuable to a wider community (i.e. taking responsibility) (Lackéus, 2015, p. 9).

Lackéus (2015, p. 30) presents the three models from entrepreneurial domain such as Effectuation (Read et al., 2011), Business Model Canvas (Osterwalder and Pigneur, 2010), Customer development /Lean Startup (Blank and Dorf, 2012). In addition, the three other tools from other domains are reviewed such as Appreciative Inquiry (Bushe and Kassam, 2005), Service-learning (Kenworthy-U'Ren et al., 2006) and Design thinking (Dunne and Martin, 2006). All six models are contrasted in such aspects as value creation, interaction with outside world, team work and action.

Lackéus (2015, p. 10) referring to Fayolle and Gailly (2008) stresses that the varying definitions of entrepreneurship and resulting variations in pedagogical approaches have made it difficult to give teachers firm advice on how to approach entrepreneurial education.

Discussion around entrepreneurial education contrasts between a "traditional" and an "entrepreneurial" way of teaching. Positivism is put versus interpretivism, traditional education versus progressive/constructivist education, and traditional education versus entrepreneurial education, scientific method versus entrepreneurial method as contrasted by Lackéus (2015, p. 15). Descriptions of traditional education are 'simplicity, individual, content, detached, theory', but diverged attributes of entrepreneurial education are 'complexity, social, content, process, attached, practice' (Lackéus, 2015, p. 15).

The features explain why entrepreneurial education can trigger much higher levels of motivation, experienced relevancy, engagement and deep learning than can other pedagogical approaches (Lackéus, 2015, p. 15, referring to Lackéus, 2013).

Lackéus (2015, p. 15) specifies major focus of Entrepreneurial Education on 'problems, opportunities, authenticity, artifact creation, iterative experimentation, real world (interaction), value creation to external stakeholders, team-work, work across extended periods of time, newness / innovativeness, risk of failure'. Only problems and authenticity are the focus in compared, 'often stated to be similar' approaches: Entrepreneurial Education, problem-based learning, project-based learning, service learning. Team-work focus appears in problem-based and project-based learning, artefact creation in project-based learning, work across

extended period of time in project-based and service learning, additionally service learning involves real world (interaction), value creation to external stakeholders (Lackéus, 2015, p. 15).

'Teachers should give their students assignments to create value (preferably innovative) to external stakeholders based on problems and/ or opportunities the students identify through an iterative process they own themselves and take full responsibility for.' To alleviate the levels of difficulty and uncertainty such an assignment can result in, *a team-work approach* should be applied giving the students access to increased creative ability and peer learning opportunities. Lackéus (2015, p. 27) outlines the relation between educational assignments involving creation, triggered activities / events including 'interaction with outside world, uncertainty and ambiguity in learning environment, teamwork environment, overcoming competency gaps, presenting in front of others', developed entrepreneurial competencies as 'increased self-efficacy, increased uncertainty and ambiguity tolerance, increased self-insight, formation of entrepreneurial identity, increased marketing skills, and others'

Assessment in entrepreneurial education

Lackéus (2014, p. 22), contrasted current assessment focus in entrepreneurial education based on Theory of Planned Behavior (TPB), case studies and entrepreneurial outcomes to a future complementing assessment focus proposed to be built on Experience Sampling Method (ESM). TBS is proposed for assessment of thoughts before and immediately after education, case studies as assessment immediately after and years/ decades after education, ESM for thoughts, actions and emotions during education, entrepreneurial outcomes to assess actions years / decades after education (Lackéus, 2014, p. 22).

The CSCT Project Group (2008, p. 189) referring to de Haan (2006) mentions that ESD specifically involves the acquisition of a number of sub competencies subsumed under the term '*Gestaltungskompetenz*', which can be translated as 'shaping competence'. 'Gestaltungskompetenz' means "having the skills, competencies and knowledge to enact changes in economic, ecological and social behaviour without such changes always being merely a reaction to pre-existing problems." Thus, the concept of 'Gestaltungskompetenz' is particularly characterised by such key competencies as enable a forward-looking and selfdependent active involvement in the shaping of sustainable development.

For the construction of the study programme the following methods are recommended by CSCT Project Group (2008, pp. 181–183): blended learning, selection of a problem field relevant to society, systematic analysis using the syndrome approach, substantiation with a case study, scenario

development, project proposals, synthesis of the development paths. All these six stages are delineated in the *systematic approach* of the study programme (The CSCT Project Group, 2008, p. 183).

UNESCO (2017, p. 7) states what ESD requires is 'a shift from teaching to learning. It asks for an action-oriented, transformative pedagogy, which supports self-directed learning, participation and collaboration, problem-orientation, inter- and transdisciplinarity and the linking of formal and informal learning. Only such pedagogical approaches make possible the development of the key competencies needed for promoting sustainable development.'

GE, GD, ESD, ESDGC can be embedded in course description, context, topics and subtopics, teaching and learning materials, delivery methods, activities; the role of the teacher, learning environment, assessment, feedback and self-reflection.

The concepts of approaches to embed GD and related meanings as GE, ESD, ESDGC have been demonstrated. The list of approaches varies on the basis of the purpose of embedding considering the discussed benefits and drawbacks.

Learning Challenges

The four learning challenges by Lehner, Wurzenberger (2013, p. 361), referring to Lang-Wojtasik (2013) and approaches from Selby and Rathenow (2006), are *spatial, objective/issues, temporal, social.*

Fook, Sidhu (2015, p. 608–610) have delineated the following learning challenges by students in higher education: cognitive challenge, becoming an active learner, coping with reading materials, language problem, instructional problem, time management, assignment burdens, culture difference.

Research Methods

The grounded theory, an exploratory method, was used for identification and conceptualization of the patterns to structure findings by the process of comparison of different approaches and practices in including qualitative and quantitative analyses. A case study was designed to demonstrate a practical application of optional embedding GD in the course design.

Research Question is in what ways GD can be embedded in Adult Curriculum to achieve Sustainable Development Goals' targets including SD4 Quality Education and overall enhancing education.

The Case Study 'Embedding Global Dimension in the Hospitality Business Toolkit'

The case provides practical examples on the basis of grounded theory of embedding Global Dimension, ESD, ESDGC in the Unit 'The Hospitality

Business Toolkit" by HOTEL SCHOOL Hotel Management College, Riga, Latvia. The Unit 'The Hospitality Business Toolkit' is one of the units of the Hospitality Management Programme 2018, BTEC, Higher National Diploma, UK, Level 5, credit value 15, designed by Pearson, the Business and Technology Education Council (BTEC). The course is core, mandatory group, A. (Pearson BTEC, 2017, p. 102.), teaching and learning language is English.

According to Pearson BTEC (2017, p. 11), 'students need both relevant qualifications and employability skills to enhance their career prospects and contribute to their personal development. Where employability skills are referred to in this specification, this generally refers to skills in five main categories: cognitive and problem-solving skills, intra-personal skills, interpersonal skills, commercial skills, business skills in addition with academic study skills (Pearson BTEC, 2017, p. 12).

The unit 'the Hospitality Business Toolkit' includes the learning outcomes related to the Finance in the Hospitality industry, Law for Licensed Premises, and Human Resource Management and coordination of the departments related to Operational Management (Pearson BTEC, 2017, pp. 102–108).

By contrasting the eight principles of Global Dimension and the learning outcomes, the included topics in the unit by BTEC Pearson (2017, p. 102–108), the embedding of GD principles has been evidenced in the course.

The GD principle '*global citizenship'*, described as gaining the knowledge, skills and understanding of concepts and institutions necessary to become informed, active, responsible citizens (McGough, Hunt, 2012, p. 5–6), is embedded in learning outcome LO3 'illustrate the potential impact of legal and ethical considerations on a hospitality business' with assessment criteria 'critically reflect on the potential impacts of regulations, legislation and ethical principles upon decision-making in a hospitality organisation, providing specific examples (BTEC Pearson, 2017, pp. 102–108).

The GD principles '*conflict resolution'*, '*social justice*', '*human rights*', '*diversity*' (McGough, Hunt, 2012, p. 5–6), are embedded in LO3 and LO2 'assess how to manage the Human Resources life cycle within the context of HR strategy' with assessment criteria 'make valid judgements and recommendations on how HR processes and documents can be improved for effective talent planning throughout the HR life cycle' for Distinction level.

The GD principle '*values and perceptions*', explained as 'developing a critical evaluation of representations of global issues and an appreciation of the effect these have on people's attitudes and values' (McGough, Hunt, 2012, p. 5–6) can be found in LO1, LO2, LO3 and LO4, where LO1 is 'investigate how to manage finance and record transactions to

minimise costs responsibly within the hospitality sector', but LO4 is 'explain the importance of coordinating and integrating various functions of departments within the hospitality sector' with assessment criteria 'critically analyse different methods of communication, coordination and monitoring within a specific department of a hospitality organisation and make justified recommendations' (Pearson BTEC, 2017, pp. 102–108).

The GD principle '*interdependence*', understanding how people, places, economies and environments are all inextricably interrelated, and that choices and events have repercussions on a global scale and the principle '*sustainable development*', (McGough, Hunt, 2012, p. 5–6) are traced to all four learning outcomes.

The GD skills, delineated by McGough, Hunt (2012, p. 8), are evinced as embedded in the Hospitality Business Toolkit learning content and outcomes including 'understanding that people have different values, attitudes and perceptions, understanding the importance and value of human rights, developing multiple perspectives and new ways of seeing events, issues, problems and opinions, questioning and challenging assumptions and perceptions, understanding the power of the media in influencing perceptions, choices and lifestyles, understanding that the values people hold shape their actions, using different issues, events and problems to explore children and young people's own values and perceptions as well as those of others' (McGough, Hunt, 2012, p. 5–6).

As alternative pattern, GD Principle 'Sustainable Development' Skills traced to the Hospitality Business Toolkit Selective Content of the Unit Topics including 'recognising that some of the earth's resources are finite and therefore must be used responsibly by each of us' (McGough, Hunt, 2012, p. 5–6): control of resource allocation: stock taking, inventory costings, systems of waste management, flagging cost control issues and progress in terms of targets and expectations (Pearson BTEC, 2017, pp. 102–108).

Another example of the embedded skills to obtain in the course 'considering probable and preferable futures and how to achieve the latter' (McGough, Hunt, 2012, p. 5–6) related to the topics such as use of budgets for planning and control: income streams, fixed costs and variable costs, methods of forecasting to set realistic profit margin targets, pricing strategies and setting realistic targets; performance management, training and development, succession planning and maintaining employee motivation to retain staff (Pearson BTEC, 2017, pp. 102–108).

Adjoining the options of embedding GD, SD, ESDGC are explained with respect to the 'following recommended actions to ensure effective education and training with regard to green economies and green societies as integrate sustainable development into education and training at all levels,

and cultivate key competencies required to facilitate the transition to sustainability, such as entrepreneurship and *risk management skills* in order to 1) enhance *education for entrepreneurship skills* to promote the launch of new enterprises and self-employment directly and indirectly related to the green economy, 2) provide entrepreneurship training and business coaching for young people and adults to start up green businesses in conjunction with microfinance projects in developing countries (UNESCO, 2012, pp. 6–7).

The assignment set up for the unit include the four separate task submissions with different deadlines according to the delivered sessions, materials and time necessary to perfume the tasks.

The first assignment part is development of the Risk Management Plan, the report and presentation, group work up to 5 persons. The learners (described in Investigation Results) carry out a detailed risk assessment for one type of licensed premises. In addition, the students reflect on such aspects as International Environmental Standards and its benefits, certification, environmental management programs, ISO, EMAS, environmental quality signs, eco labels, sustainable business ethics, Corporate Social Responsibility (CSR) (Zvereva, 2019, 'Assignment').

The second assignment part is Financial Business Plan of the value added business idea to a new hospitality business or an existing hospitality business including the three financial scenarios of the business idea budget, trial balance, financial analysis with analysis of energy consumption and proposal for optimization (Zvereva, 2019, 'Assignment').

The third part of the assignment is participation in the X-Culture Global Collaboration Course (North Carolina, the U.S.) involving theoretical training and two months of practical experience as a member of a Global Virtual Team. The teams develop a high-quality business plan for a multinational company working alongside over 5,000 students from 110–150 universities in over 40 countries on 6 continents. The students get random allocation on teams after passing the pre-readiness test to get acquainted with the instructions, communicate to the team members from different countries to develop a business proposal according to set framework and milestones (X-Culture Project, 2019, www.x-culture.org).

The forth part of the assignment is the individual task, preparing a Human Resource Management Plan or HR Training Programme for a specific hospitality job with analysis and recommendations of corporate governance structure, HR system, ethics in the hospitality business company, with sustainability focus (Zvereva, 2019, 'Assignment').

The optional embedding is via adaptation of the course title focusing on the sustainability with change to the Sustainable Hospitality Business Toolkit, the definition of the sustainable hospitality will be centred for the content. The length of the course also can be extended at programme

technical possibilities and necessity in case of adding the additional content depending on the standards.

The learning outcome is supplemented by the word 'sustainable' attached to the HR strategy, that changes the meaning and definitions to be delivered – regard managing the Human Resources (HR) life cycle within the context of sustainable HR strategy, where the students learn not just the HR strategy, but specifically sustainable HR strategy in addition or instead by choice of the option.

In order to embed the GD, ESD, ESDGC content in the course, the listed examples of the topics can be added: sustainable management, sustainability performance indicators (SPIs) or sustainable development indicators, Sustainable Finance, activities of sustainable finance, benefits of organizing for sustainability to the bottom line, Sustainability Accounting Standards, Sustainability Accounting Standards (Zvereva, 2019, 'Assignment').

The topic Energy can be embedded in the unit as the part of the theme Financial Management and Recording Transactions to Minimize Costs Responsibly within the Hospitality Sector via subtopics sustainable budgeting and control of resource allocation with example how to use GRI Indicators to measure company performance in energy consumption, resource control and saving within the Environmental Aspect by Energy and to build company performance analysis and budgeting on the GRI Indicator (GSSB, 2016, "Global Reporting Indicators").

It is proposed to apply ESD principles in development of the design of the materials: vertical layout, neutral colours, and most friendly fonts to reading thus embedding *health* topic into design. Learning environment choice related to Sustainable Hospitality Business can be a site, where SD principles should be implemented as soon as possible or a site, where SD principles have been already implemented – open nature or alternative energy site related to hospitality business.

Investigation Results

A synthesis of approaches has been applied by embedding the GD in the Hospitality Business Toolkit including subject-oriented approach, action-by-learning approach, competence-based approach, competency-based approach, holistic approach, Entrepreneurial Education approach. The GD was embedded at all levels of the unit delivery.

The unit was delivered from February 2019 by May 2019 to 30 students, 96.6% students have started the course with the average attendance 59% and average rate of regular 83.3% of attendees was 69%.

In the frame of the third part of the assignment, 29 students have applied for participation in X-Culture project from March 05, 2019 by

April 28, 2019. In total, 23 students of 29 (79.31%), average age 19 years old, from 9 countries were not excluded by the team and by the results during the project. Collectively, there were 698 teams with average 5–7 students on team. The average grade in the project track is 5.24 (74.86%) of scale 7 (X-Culture, 2019), the average grade of 22 Hotel School students of 23 in the list graded by 5-7 professors per report is 5.3 (75.71%) of 7. One of the students from Sri Lanka got in the list of the winning 40 best teams of 698 teams.

Analysing the results of the first task of the group assignment, Risk Management Plan, 23.4% of students have received 9 and Distinction, 40% of students – 8 and Merit, 16.6% of students – Pass from 5 to 7, 20% of students have no grades.

Total results of the individual exam in addition to BTEC assessment criteria are the following: 24 (80%) students of 30 have taken the exam with 100% positive results.

The final positive grades in the Unit were received by 26 (86.67%) of the 30 students with possibility to improve BTEC criteria in assignments at timely first submission. The final grades for criteria P, M and D involve meeting all criteria included in the programme by Pearson BTEC (2018, p. 102–108). However, the tutor auxiliary has applied the formative assessment by the two mid-term tests and the final exam for the numeric grading in addition to P, M, D scale.

Analysis of Achieved Learning Outcomes and Grading

Based on the conducted analysis of the results, the findings suggest that in general the results of the group work are higher than individual, therefore, it is important to include both group and individual tasks to assess the achievement of learning outcomes. On the other hand, the group work opens additional experience sharing and collaboration experience traced to employability skills and sustainable development.

During the unit completion, the students have faced such challenges as coping with reading materials, language problem, time management, assignment burdens, culture difference based on the submissions, however, it is recommended to consider a future study of the learning challenges identified by the learners.

Discussion

The utmost importance is in the synthesis and integrity of the criteria and approaches to be applied to embed GD, ESD, ESDGC in the competence based units with variety of the methods of the assessment to enable

a holistic approach as it has been piloted by the case of the Hospitality Business Toolkit.

Another point to discuss is that in previous programme the Finance Unit was included in the third term when the students are already experienced in BTEC criteria system and have basic knowledge in other units, but the updated programme sets the Hospitality Business Unit as the first term unit when students face with law, financial management and accounting built in the Business Toolkit Unit.

Conclusions

The most obvious finding of this study is that a synthesis of approaches to embed GD, ESD, ESDGC in the curriculum is of utmost importance. The balance should be kept between values, employability skills and, in particular, financial literacy. The weight of the focus on values and employability skills should not denominate the significance of the competences and particular aspects as financial literacy. The unity between the content, form and context in which the learning process takes place is significant for designing teaching-learning-evaluating strategies as from theory review.

It is very important for the tutors and programme leads to orientate among the variety of approaches to use them for efficiency and enhancing overall quality including grading, values, actions by the learners.

The response to the research question has been provided by studying and demonstrating the ways GD can be embedded in Adult Curriculum to achieve Sustainable Development Goals' targets including SD4 Quality Education and overall enhancing education.

The Aim of the Research is achieved by performed objectives, a conceptual overview of the approaches to embed GD in Adult Education Curriculum has been presented.

The research raised the questions to study in future exploration. The theory review demonstrates the diversity of theoretical and practical application of the approaches to embedding ESDGC and GD as well as absence of exact framework solution and data.

Contribution

An extensive literature review as a conclusion of the EU Erasmus KA2 Project Intellectual Outputs on embedding ESDGC and GD conducted collaboratively and individually has been presented in order to demonstrate the existing spectrum of approaches noted for embedding GD, ESD, ESDGC not to denominate any of the mentioned approach as each of them

individually might be of utmost importance for the designs of effective curriculums, courses, assignments.

Limitations

The case is based on a single case analysis with the limited number of students, which is, however, a vivid international example of the approaches and techniques to embed GD, ESD, ESDGC in the curriculum and course design. The unit was delivered as first time delivery with embedded GD, ESD, ESDGC without an opportunity to compare the historic results of the same unit delivery excluding embedded GD, ESD, ESDGC as well as comparing several deliveries of the same unit set.

Recommendations for Further Research

As further research, the results of the same unit delivery over several terms are suggested to be investigated to work out the result statistics and study the influencing factors, the most effective and least effective approach taking into consideration multicultural students and institution external environment to focus on the approach combination taking in consideration the prior learning challenges in different regions.

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THE CULTURAL COMPETENCE PORTFOLIO AS A LONG-TERM INNOVATION FOR ALL LEVELS OF EDUCATION

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ABSTRACT

The paper describes the cultural competence portfolio, which is an innovative approach to the organisation and evaluation of the study process. This includes an active involvement of various study process components: creative work, expression of original ideas, recording of the research process and prevalent self-evaluation. The relevance of the subject of this paper is highlighted by the ongoing education reform in Latvia, which is built around a purposeful, systematic competence development in eight of the basic components for lifelong learning (*European Parliament recommendations of Key competences for lifelong learning* – 2006/962/EC). One of these components is cultural awareness and expression. The research consists of three parts:

- the portfolio approach in the study process;
- cultural competence as a quality indicator of the education;
- specific options of realisation and evaluation.

According to the definition, a portfolio is a collection of artefacts, materials and works, accumulated over a certain period of time and it includes three equally important elements of the competence: knowledge, skill and attitude. The portfolio demonstrates accomplishments of a study process and serves as a positive self-evaluation in one or several areas. The portfolio approach can be used in different areas, but it has an especially high value in culture and arts studies. Therefore, the main topic of the research is the cultural competence portfolio in particular, which can ensure the compliance with the education levels, defined by the European Qualifications framework (EQF).

The cultural competence portfolio is a collection of personal documents, which can and preferably should be supplemented, re-organised and changed over a long-term period in line with its aims. Such portfolio is a tool to fulfil the aim of education and to reflect on some specific achievement. Not only is it an important tool in the areas of culture and art – for actors, musicians, architects, and models but also for every, student and human, who intentionally wants to develop his / her cultural competence as a lifelong process.

Keywords: Portfolio, Cultural competence, Learning methods, Long-term innovation.

Introduction

There are two reasons that substantiate the topicality of this paper. The first is the rapid development of new technologies and digital communication, cognitive tools and everyday reality. This has created a necessity to introduce in practice such teaching/learning methods that would reveal the value of the digital information flow and would correspond to the new requirements of the society, explaining the study process as a long-term innovation on all levels of education. Therefore, the emphasis should be laid on switching from a ready to use knowledge to a guided learning. This process has already been started, and it is especially topical at the university-level studies. Due to this reason, the paper explores on the study dealing with the impact of the development of the portfolio on the study process. After the first two steps are completed, the final assessment will be provided. The experiment was carried out in the Medieval art history course within the bachelor study programme at the Latvian Academy of Art It was performed from 2016 till 2018, involving 145 second year students.

The second reason is the education reform of Latvia implemented in the frame of the National Centre for Education project "Competence-based approach in the teaching/learning content" (Skola2030, 2019). Its aim is to work out, pilot and then introduce successively innovative changes in the teaching/learning approach. What is at the heart of this reform is that students should be capable of applying their knowledge and skills acquired at school in real life situations; they should develop a deeper understanding of subject in each teaching/learning domain. In order to achieve this, the learner should be at the centre of the study process; he / she should learn to think, cooperate, seek answers. This suggests that each student should be able to construct the meaning of the acquirable content. Within the framework of the project, a survey was carried out in the second part of 2018. It involved 737 parents and 3304 students from 327 schools of Latvia. (as respondents). The project manager Olina points out that the aspects that have been identified during the survey complies with the offered new teaching/learning content. It provides broader aims for education as it is envisaged to acquire also general skills or transversal skills, to cultivate value-based habits, the skill to apply the knowledge in complex situations along with the knowledge at school. The fragmentation and the scope of the teaching/learning content is reduced to the emphasis on interconnections and interdisciplinarity. In their answers, students have expressed the desire for a personalized approach to the teaching/learning process. They feel that sometimes their diligence and invested work is undervalued. Thus, students and their parents consider that the assessment system should be oriented

towards the personal growth. Students also indicate that they wish their contribution, the invested work, attitude and diligence were also assessed, even if the final performance or outcome is with mistakes (Skola2030, 2019). The answers, particularly, support the conclusion, which is also important in the context of this paper: the assessment is inadequate in the subjects of culture understanding and art domain. Consequently, when grading subjects such as art and music, the teachers should consider specific aspects, for example talent being one of them. This will definitely lead to a better structured and understandable way of assessment.

Students are offered to compile a cultural competence portfolio as one of the methods and innovative ideas in the context of the Educational system of Latvia, which would serve both as the reflection of the learning process and the indicator of personal growth. Additionally, it is going to demonstrate the usefulness of outcomes and demonstrate the attitude – contribution, efficiency, the invested work and diligence.

Both reasons are topical on all levels of education and lifelong learning. (And the above-mentioned topicalities have defined the idea of this paper). Therefore, the aim of the paper is to discuss the approach of compiling the cultural competence portfolio as a long-term innovation and reveal a learner's attitudes towards forming a portfolio as an opportunity for applying it as a quality indicator of education. Three objectives are set for the research analysed in this paper:

- to determine the place of the portfolio approach in the study process;
- to argue that cultural competence may serve as a quality indicator of education in the in the era of visual communication and information technologies;
- to give some examples of specific options of realisation and evaluate *status quo*.

Several questions can be put forward in the context of the aim. What is a portfolio in education? What is the cultural competence portfolio? How to increase the learning motivation and how to assess attitude and what is the correlation between each other?

Methodology

A portfolio as a learning method (Paulson, 1991, Hamp-Lyons, 2000, Grosch, 2003, Adamski, 2003, Winter, 2015) is emphasized by distinguishing three types of a portfolio (personal, professional and study). The second part of the paper substantiates the acknowledgement of the cultural competence portfolio as the learner's personal growth indicator. Its introduction in the teaching/learning process can improve the study programmes, thus, (being able to implement?) implementing

a meaningful learning process? (Sauleniene, 2015, Dellen, 2012, Milson, Brantley, 1999). The third part, referring to the samples of history portfolio, describes a concrete task of the study process. The results are elucidated with some concrete data obtained from a practical study about the impact of the portfolio on the study process.

The portfolio approach in the study process

The term portfolio is widely used and is especially well-known in art professions. It serves as a proof of the professional mastery and usually is a collection of pictures, papers or ideas. In the etymological sense, portfolio – *portare* (Latin) means: to have or hold; *folio* – paper, sheet of paper; *protefeuille* (French) means – carry (*porter*) sheet (*feuille*); portable folder for papers, books, textbooks, notebooks. In the study process, it means a selection of a student's work (such as papers and tests) compiled over a period of time and used for assessing his / her performance or progress (Portfolio, 2019). The first precise definition of what portfolio is in the teaching/learning context has been developed and presented in a conference in ... already in 1990 but published a year later: "A portfolio is a purposeful collection of student work that exhibits the student's efforts, progress, and achievements in one or more areas. The collection must include student participation in selecting contents, the criteria for selection, the criteria for judging merit, and evidence of student self-reflection" (Paulson, 1991, 60). Eight guidelines that (would) promote self-guided learning are mentioned and the strength and importance of this idea are substantiated. For instance, what is especially topical in 2020, i.e., 30 years later – is the third comment about the importance of the so-called student's cumulative folder. Nowadays, many people have such a folder with a collection of pictures and texts. They can be stored as an e-portfolio (digital portfolio). Whatever richness of information they had in the files, the portfolio should only include the information that provides some context with the rest of the collected material. The author then can allocate a new value this material through the already developed context. This is a direct answer to the topical question – does the wide accessibility of information already solve the topicality of learning? It is possible to claim that only such information, which has its particular place in the existing notions (thus, the principle of self-evident succession) and to which its acquirer can allocate the context meaning (thus, already the meaning of application) is useful for further studies? The information itself (whether it is copied or available only digitally) cannot help much if it has not found a concrete place and if it does not form a context with what has been known before. A certain level of competence (corresponding to the learner's age group) is needed for establishing the context. Therefore, the use of both words together directly refers to the learning process. The term means an organized set of factual

materials, individual works and projects, which have been collected over a definite period of time and serve to reflect the learning achievements, skills and attitude. In essence, it is a tool for positive self-assessment in one or several areas or subjects.

Cultural competence as a quality indicator of the education

The competence is considered to be a wider concept than knowledge and skills. It includes also motivation and attitude in its cognitive and socially ethnic facets (Cedefop, 2014). The competence can be learned (Nordenbo, 2008, 70). This is especially important for developing the indicators, because it is important to understand the contribution of the education towards the development of competence. Similar to portfolio the competence has two dimensions – an external and an internal dimension.

The cultural competence encompasses analytical knowledge, positive and simultaneously interested understanding of cultural heritage, the significance of a cultural era phenomenon and its emergence types (knowledge); the necessity and skills to apply the cultural values, to evaluate and create new ones, thus developing new learning methods (skills); a developed capability to evaluate the interrelationships and motivation and self-evaluative attitude to act creatively and actively as well as in accordance with cultural topicalities of the era (attitude). All three mentioned parts of the competence are reflected in the content of the competence portfolio. The depth of the knowledge (the scope of facts) and their arrangement and comments (skills), the structure and appearance of the portfolio, which show the attitude, can be assessed. The content of cultural competence portfolio represents an organized set of factual materials, own works and projects, which have been collected over a definite period of time and serve to reflect the learning achievements, skills and attitude. Actually, it is a tool for positive self-assessment in one or several areas. The portfolio can be compiled in two ways. One is the- so-called "external" way, which comprises everything that corresponds to the aim and can be found in the study process, and the other; the-so-called, "internal" way contains the reflection of the student's learning process – the personal contribution, growth and work with the "external" part (Sauleniene, 2015). The selection of the collected materials has been performed; comments, reviews, critical analyses, drawings, digital collections, etc. have been carried out. The "internal" part of the portfolio is the most important one. The personally significant, meaningful, experienced and reflected material comprises its content. "When being compiled during studies, the competence portfolio can help to improve study programmes and ensure deeper and more meaningful studies" (Sauleniene, 2015, 92). It is the practical part of the teaching/learning process the importance of which is especially emphasised in the education reform.

Specific options of realisation and evaluation

It is also possible to define the structure of the portfolio. Firstly, it is a reflection (questions, contemplations) about all that has been heard, seen, experienced – the selection has to be done depending on the aim and objective of the portfolio (it can be thematically narrow, interdisciplinary, devoted to the particular project, etc.). Secondly, it is an annotated bibliography which means a collection of the collected materials – documents, books, internet sources, music, etc. and comments on them. This part includes also study materials – self-control tests, tasks, etc. A significant condition is a systematic work with these materials during a particular time period, namely, to develop metacognitive skills and to apply them purposefully. The teacher's assistance is needed here; therefore, the self-evaluation process should be structured and it must be analysed together (both in mutual cooperation with and under the teacher's guidance). This fosters the habit of thinking (reflecting) on what is known and what happens during the teaching/learning process. "As students select items for inclusion, they are expected to develop and express clear rationales for how these items demonstrate knowledge acquisition and reflective thinking" (Milson, Brantley, 1999, 375). This develops purposefulness and habits of practical (rational) action and allows avoiding the inclusion of ungrounded or formally added materials.

The practical part of the learning process is very important; it should include visits to exhibitions, purposeful tours and trips. The activities should be well-considered and targeted. Students should reflect on the activities by writing essays, critiques or reports. Everything that has been experienced is noted and reflected upon. An artists' portfolio mainly consists of drawings. In this case, drawing is similar to thinking. It is a process which records the retrospectively important experience. In history, there are many examples which show that the collections of sketches and drawings have formed a self-guided (lifelong learning) process. Very often it is a process caused only by the-so-called self-initiative (initiated by self-motivation). It is worth here highlighting three differently preserved examples, whose cultural, historical and pedagogical importance are invaluable. The first to be mentioned is Johann Christoph Brotze (*Broce,* 1742–1823), a teacher, historian and ethnographer of Livonia. Brotze's heritage is a unique portfolio containing thematically, factually and chronologically diverse, but unsystematic materials, including a large number of unique – anywhere else not documented – historical references. There is an impressive collection of Brotze's drawn and collected pictures: 10-volume manuscript *Sammlung verschiedner Liefländischer Monumente, Prospect, Müntzen etc.* (Taimina, 2013, 18). This portfolio demonstrates not only J. K. Brotze's personal interest in the history of culture but also the reflection of the Livonian

society of the 18th century – it serves as a mirror of knowledge, skills and attitudes. This is a collection with a unique, wide-scale value.

The second example, also important in the context of this paper, is Leonardo da Vinci *Codex Arundel. Notebook of Leonardo da Vinci* (*Leonardo da Vinci,* 1452–1519). It is a portfolio (1480-1518) of completely self-guided, unstoppable and ravenous process of research and analysis, the collection of contexts and inventions, created by one author. It consists of notes, diagrams, drawings, texts, covering a wide range of topics in science and art. Some personal notes (on 283 paper sheets) are also included. Leonardo has described it as "a collection without order, drawn from many papers, which I have copied here, hoping to arrange them later each in its place according to the subjects of which they treat" (Leonardo da Vinci, 1518). It should be mentioned that he himself failed to structure it. It is only one example that proves the necessity to structure and arrange one's portfolio materials since the very start – and this should be taught to every student already at an early age.

The third example is directly connected to the qualitative research, in which the obtained data serve as evidence for the positive impact of the portfolio on the teaching/learning process. The author used the study portfolio of the artist and architect – Villard de Honnecourt (*Vilars de Honecourt*, before 1230 – after 1235), who lived in the 13th century, as the source of inspiration for this task. It is the oldest known portfolio of such a type. The author has recorded buildings, people, clothing, furniture, household items, animals, details, tools, inventions etc.. These are 33 parchment sheets with 250 drawings, which are the most important original source from the High Gothic about the architecture and methods of construction (*Honnecourt*, 1906). Inspired by these, students received a task to form a portfolio of drawings with 33 sheets as a minimum, to provide substantiation for the idea and comment on each of the drawings about the source and the reason for including it in the portfolio. Those could be sketches in nature (time, place in relation to the Middle Ages?) and collected images (with indicated source, value, importance to medieval research). (The qualitative research obtained data about the impact of compiling a portfolio on the study process and the final assessment in the Medieval art history course in the bachelor study programme at the Latvian Academy of Art. The research was performed from 2016 till 2018 and it involved 145 second year students.) The following were set as the assessment criteria – the size, uniqueness of an object, choice, imagination and vision when drawing modern objects Additional items such as professional substantiation and their relationship to the medieval ideas were required to be included. The format was not prescribed, and this allowed students to express themselves in the most diverse ways – as

a result, miniature masterpieces in *octavo* format (170×108 mm), and large parchment-like sets of pages in the *folio* format (445×307 mm) were received; each student had a possibility to find the format and technique that corresponded to his/her artistic way. An approach to apply the methods of the chosen art studies area was suggested, e.g., students of the glass study department were advised to study stained glass in more detail but sculpture department students – works of sculpture. A prerequisite of such a task is the length of the study course which cannot be shorter than 20 weeks because the compilation of the portfolio occurs along with the study process. The instructor encouraged students to study literature and digital sources. This was done with a purpose to improve the drawing skills of students. The particular approach however, was not assessed as academic professionality. Each of the above-mentioned criteria needs broader comments, which are subject to a separate paper.

Results

The description of results includes the qualitative data which was obtained during the examination days when giving back the portfolio materials to the students. Then the benefits of this task were discussed, and the students expressed their opinion about such an assessment form. As the research includes three student groups from different study years, the data were structured according to these years and summarised in the spring of 2019. The research participants were in total 145 respondents in average age of 20 years and of various art programs at the Latvian Academy of Arts. During the exam, students took part in interviews. They provided answers to the same 5 questions; the results are summarised in Table 1. After the interviews, the answers were coded und differentiated on three levels.

As seen in Table 1, all in all students' attitude to this task was very positive. The average indicator of a very positive assessment of the task is 70%. It is important to indicate that 9% of students who have not considered the task useful actually are the ones who have not attended the classes (or have done it rarely). Thus, they have been outside the common study atmosphere and its impact. A significant indicator are the answers to the fifth question, where positive ("fully agree") answers are only 54%. This shows a low self-assessment, probably the inability or the lack of experience in assessing one's own work. Another important indicator is that with every next year and especially in the third year the number of positive assessments continued to increase. This allows to conclude that there is inter-communication among students and the positive attitude has been spread; thus – the disposition to such a task becomes more positive and

is taken for granted. So, it is possible to change the conditions of the task, enlarging the depth of the study and solving the possible options in order to introduce reciprocal evaluation. In case of the portfolio, their display for general viewing was problematic, and it took a rather long time to receive the assessment. But such a solution would give an additional value to this task because students would gain their own experience and understanding about different ways of visual expression, different ways of thinking and perception of the study content.

Table 1. Qualitative survey (individual discussion) about the importance of the portfolio in the study process.

Academic year	2016/2017			2017/2018			2018/2019		
Number of students	53			48			44		
Commented opinion	Fully agree	Partly agree	Dis-agree	Fully agree	Partly agree	Dis-agree	Fully agree	Partly agree	Dis-agree
1. Did the compiling of the portfolio help/ motivate for deeper studying?	35	10	8	32	8	8	37	5	2
2. Has the compiling of the portfolio changed the initial views about the medieval culture and art?	33	15	5	29	14	5	39	5	0
3. Would it be beneficial to use such a form of tasks also in the acquisition of other periods in the history of art?	28	20	5	34	10	4	39	3	2
4. Has the compiling of the study portfolio helped the professional development?	42	8	3	40	8	0	37	5	2
5. Do you consider your portfolio interesting, useful and artistically important material?	26	18	9	28	10	10	25	15	4
Total : 5 questions	164:5	71:5	30:5	163:5	50:5	38:5	177:5	33:5	10:5
Percent of students	62%	27%	11%	68%	21%	11%	80%	15%	5%

The second correlation that was stated and which is a significant indicator of the portfolio's impact on the study process is the quality of the final assessment. When summarizing the research data, a question was posted whether a link existed between high assessment of the portfolio

and the assessment of the examination work. It was established that out of 145 respondents 65, who had received high assessment of their portfolio, had also passed the examination with an excellent, very good or good mark. However, it is only 44% of the total number of respondents. This result shows that even before getting the assessment in the examination, there are more those students who have expressed a positive attitude to the compiling of the portfolio (70%). It serves as evidence that there will always be students who are willing to perform different practical tasks but are not ready to participate in the theoretical part (acquisition of knowledge) of the study process. In all cases, when students received the highest mark in the examination, their portfolio had also been highly assessed. There are rather few cases, when it did not correlate, and the reasons are various – as admitted by students themselves – it has been the lack of time, illness, unexpected situations, laziness, etc.

Conclusions

1. Portfolio is a compilation of academic work and other forms of educational evidence assembled for the purpose to reveal the learning process; it is an essential tool both for students and educators.
2. Any portfolio in its substance is a cultural competence portfolio. It is a "living" document, which can be always supplemented, restructured and expanded to meet the goals. It is a personal document, which becomes a tool to accomplish the academic goals.
3. Reflection is an important component of the portfolio method. It is crucial not only to collect the documents in it but also to have a clear understanding, what and why is compiled in it.
4. The portfolio is an alternative assessment method with formative value for students that fosters the learning motivation in a positive way.
5. Students and teachers can use the portfolio as a basis for discussion and reflection on the academic achievements and learning process due to the "living nature" of the portfolio.

The compiling of the cultural competence portfolio improves the learning outcomes. It promotes self-guided learning, helps to memorize the chosen (significant) facts, deepens the understanding and affects positively students' attitude to the learning process in general, which, in turn, facilitates the cooperation skills, positive attitude and the realization of motivated learning in the study process becoming a long-term innovation in the context of lifelong education.

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MAPPING AS A TOOL FOR BIOMATERIALS STUDY CONTENT HARMONIZATION WITH SIGNIFICANT RESEARCH FINDINGS

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ABSTRACT

Riga Stradins University (RSU) has almost 70-year-experience in implementing health care and 20-year-experience social science studies. RSU has more than 9000 students, 26% of whom are international students. International recognition is enabled by direct correlation between quality of studies and competitiveness of graduates. Quality of studies is being systematically improved and mapping of the study results is a significant tool in implementation of the process. A mapping system created by RSU makes it possible to analyse study programmes, study course connections, succession, implementation, novelty and correspondence to the professional standard requirements, identifying level of alignment between graduate outcomes, study programme, study course results and study activities. Consequently, it is possible to trace synergy between a study programme and development tendencies of the discipline. With rapid developments in the medical industry, discussions about the use of biomaterials are being raised, which is an essential component in strategical specialisation fields in Medicine and Dentistry in RSU. Biomaterials are used in many of today's medical devices, including artificial skin, blood vessels, hearts, pacemakers, dental fillings, wires, plates and pins for bone repair, total artificial joint replacements.

The aim of the research is to study the conformity of biomaterials content acquisition in RSU Dentistry study programme to significant research findings.

Qualitative methodology is used in the research: study course learning outcomes mapping, interviews with field experts, observation of the course, study programme and course leaders and student focus group.

Upon evaluation of the obtained research results, the following conclusions are proposed:

- The theme 'biomaterials' is very topical in Dentistry study programme and its significance is ascertained to have a tendency to increase.
- Balanced distribution of biomaterials content in the study programme is needed to ensure more successive and systemic acquisition of study results.
- To foster students' readiness to work with biomaterials in a clinic, improvement in cooperation of the faculty is necessary which would facilitate the appropriateness of specific content to Dentistry sub-sectors.

Summarising the research results, it can be concluded that study course learning outcomes mapping and interviews with education actors involved in the study programme, have helped to discover the essence and range of biomaterials content acquisition, succession, reciprocal links at study course level and appropriateness of content to significant research findings. The obtained results have been conceptualised, communicated to various target groups and update of Dentistry study programme is based on them.

Introduction

RSU is one of the most modern universities in the Baltics and enjoys a high reputation for its study quality on an international level.

One of the cornerstone principles of the quality assurance at RSU is safeguarding the relevance of the study content to industry trends and requirements. To assure this relevance, the study programme content and learning outcomes have to be reviewed and updated on an ongoing basis. To institutionalise this process of curriculum review, RSU has implemented practice of building and maintaining curriculum maps.

Curriculum mapping is a process of developing a visual map of all courses in the curriculum and evaluating course content to determine if any gaps or excessive overlap exist, and to ensure all courses meet the study programme learning outcomes (Harden, 2001; Plaza et al., 2007). Curriculum map is a tool that allows the stakeholders to visualise the curriculum by ordering the relationships between various elements of the curriculum. Traditionally the study programme content is managed by academics in isolation from each other, rarely working together to achieve the programme learning outcomes. This creates a risk that some courses will overlap and address similar learning outcomes multiple times, while not addressing some of the learning outcomes at all. Curriculum map assists in identifying these overlaps and gaps in the curriculum and make them transparent to the stakeholders (Steketee, 2015).

In 2018, RSU study programme directors mapped learning outcomes at the study programme level to learning outcomes at the study course level, creating curriculum maps for each of the RSU study programmes. During this process multiple improvements to study programmes were identified. Previous research (Uchiyama & Radin, 2009; Joyner, 2016) has identified the importance of faculty involvement in the mapping process for buy-in and effective implementation of curriculum improvements, therefore a decision to validate the relevance of mapping results with stakeholders was made.

This case study describes how curriculum mapping results were used to identify improvements in biomaterials study content, validate these findings with students, faculty and industry representatives, and achieve consensus on the necessary changes to the curriculum of the dentistry study programme.

The five-year long dentistry study programme provides a platform for the acquisition of the skills required for examination of a patient's oral cavity and teeth, identification of dental problems and for undergoing complex dental treatment. The programme emphasises the importance of first undergoing practice on dental trainer and simulation models prior to working in a clinic in real life conditions. Mapping of the programme learning outcomes indicated potential improvements in the organisation of theoretical content of the study programme related to the use of biomaterials in dentistry.

The complexity of the design of the study programme, the improvement of its implementation and the successful achievement of learning outcomes is determined by the fact that research on biomaterials is developing very rapidly. Experts all over the world are looking for the most successful solutions for developing and synthesizing bone or tissue-like materials. These smart materials can be used to develop innovative third-generation biomaterials (Rey et al., 2011). Third-generation biomaterials show great promise. They are being designed to stimulate specific cellular responses at the molecular level and that involve molecular tailoring of resorbable polymers for specific cellular responses (Hench & Polak, 2002).

Biomaterials or biocompatible materials are primarily biomimetic materials capable of not only interacting with biomaterials (such as tissues, bones), but also of imitating or even enhancing their functions (Hench & Polak, 2002).

Understanding the biological formation of different mineralized structures could lead to innovative approaches toward engineering novel scaffolds providing new therapeutics. Additionally, unlike other biomineralized tissues, such as bone and dentin, mature enamel is acellular and does not reabsorb or remodel. As a result, enamel regeneration cannot

occur in vivo following the failure and is therefore an attractive target for future biomimetic and therapeutic approaches (Roveri & Iafisco, 2010).

Contemporary dentistry applies several types of barrier membranes and graft materials used in guided bone regeneration (GBR). Each has its advantages and disadvantages. Features of materials daily use in dentistry and in maxillofacial surgery were emphasized (Rodella et al., 2011).

Biomaterials are widely used as implant materials in dentistry. An ideal implant material should be biocompatible, with adequate toughness, strength, corrosion, wear and fracture resistance (Osman & Swain, 2015).

The main goal of all these sectoral studies is to create biomaterials that are as compatible with human tissues as possible, not only to perform their functions, but even to improve them.

Aim of the Study

The development of the sector and professional performance in practice correlate directly with the quality of the study programme, which logically justifies the goal of the research to study the correspondence of biomaterials content acquisition in RSU study programme "Dentistry" to significant research findings.

Materials and Methods

In the theoretical part of the study, the scientific literature provides a justification for mapping of learning outcomes as a tool for the analysis and improvement of the study quality, as well as for the topicality of the biomaterial development research and use in dentistry.

The empirical part of the study includes several stages. The pedagogical research was carried out in RSU study programme of Dentistry from September 2018 to May 2019. Three stages were distinguished in the research plan; in which data were obtained by using various methods (see Figure 1). Stage 1: identification of Biomaterials content in the Study Programme and Study Courses and Mapping of Study Results (Learning Outcomes). The resulting understanding of thematic systematisation of biomaterials content related key words and identification of relations between the study results in various study courses. Successively, in Stage 2 the data were obtained in several clusters: structured peer observation of the study courses was made and interviews with field experts were held, and study programme and course leaders focus group was set up. As a result, the opinion of the teaching staff on the use of various materials, including biomaterials, in dentistry, on the scope of learning, succession, topicality and possibilities to implement the content according to the latest trends in science in various study courses

was summarised. During Stage 3, the final stage, a student focus group was formed. This stage of the study summarises the students' opinion on learning about various materials used in dentistry, including biomaterials (their diversity, properties, usability, topicality, etc.) in various study courses.
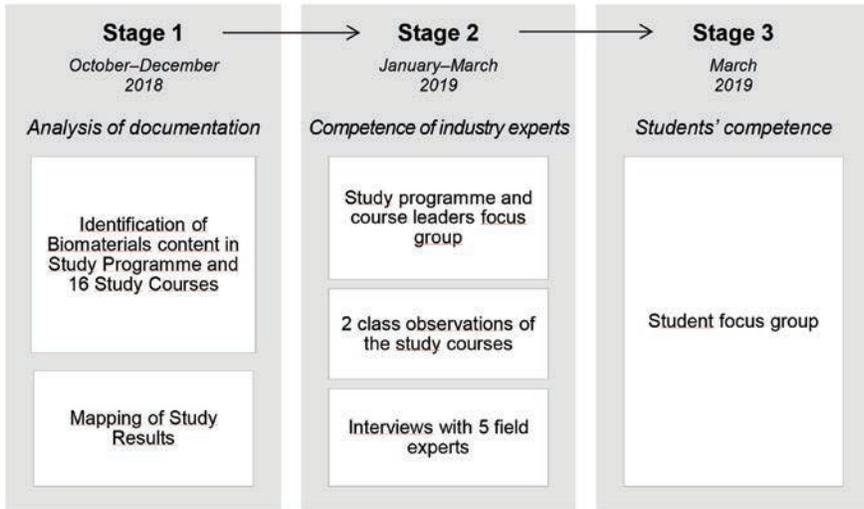

Figure 1. Stages in conducting the study

The study was conducted using the qualitative research approach with data being obtained through: mapping of study courses, interviews with industry experts and the Head of the study programme, focus group discussions with leaders of study courses and students and structured pedagogical observation. The data obtained in the study were recorded in audio recordings, transcripts were prepared and *Microsoft Excel 2016* program was used for the analysis. Personal data protection was ensured in data collection, processing and analysis.

As a result of the mapping, 16 study courses were identified in which students successively acquire the theoretical understanding of biomaterials needed for further development of skills in preclinical and clinical study courses. As a result of the mapping, a report material was created (*Microsoft Excel 2016*) on the basis of the following criteria: the department teaching the study course, the leader of the study course and the lecturers involved in the implementation of the study course, the necessary prerequisites for the students, the aim of the study course, the period needed to learn the content of the study course, the number of credit points, the main topics of lectures and practical classes, learning outcomes: knowledge, skills and competence, independent work of students, assessment criteria and the type of final examination.

These study courses were grouped according to the main areas of the dental sector: cariology, endodontology, periodontology, surgery and prosthetic. In order to successfully fulfil the further tasks of the study, the mapping results were presented in the focus group discussion for the Head of the study programme and for the leader of the study course "Biomaterials in Oral and Maxillofacial Surgery". A joint analysis of the obtained results lead to creation of interview questions for the lecturers of the study courses and for the discussion of the student focus group, and to selection of the study courses for pedagogical observation, for which a structured protocol was drawn up. For an in-depth analysis of the mapping results, an expert from each of the above mentioned areas was invited to a structured interview. Five students from the second, third, fourth and fifth year of study, that have acquired or are currently studying one of the study courses identified as a result of mapping, participated in the student focus group. Students applied on a voluntary basis.

Results

The data obtained during the study show that the mapping approach and the system used at RSU allows analysing and identifying study programmes, links between the study courses, their succession, implementation, novelty and compliance with the requirements of the occupational standard, thus providing valuable information for the analysis of the quality and successive improvement. The results structured according to data clusters were obtained in the study. As a result of the mapping, a hierarchical system of 16 study courses (see Figure 2) was created reflecting the successive learning of the theoretical and practical biomaterials content in RSU study programme "Dentistry". Acquisition of all the content in the study programme is organised in accordance with the key areas of the sector, in which the necessity for learning the biomaterials content was identified: cariology, endodontology, periodontology, surgery and prosthetic, – The table shows which study courses incorporate the topical and sector-specific theoretical material on biomaterials. For example, the study course "Preclinical and Clinical Course in Endodontics" includes the following learning outcome: the student will name and describe endodontic materials. Whereas, the learning outcome for the study course "Preclinical Course in Operative Dentistry I" is to fill the established cavities with adequate dental filling material, applying a sequence of manipulations corresponding to the material used. So, different biomaterials are used in different areas of dentistry. Figure 2, however, shows which theoretical material acquired during preclinical
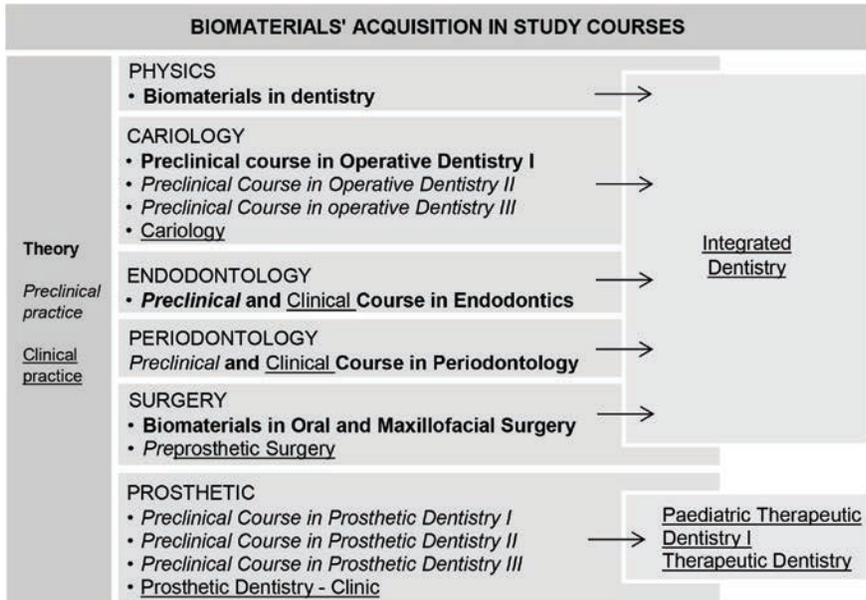
Figure 2. Curriculum Mapping resulted in a hierarchical system of study courses

study courses should be used for further development of their skills, how to select the appropriate biomaterials and use them to treat the patient. For example, the learning outcome in the preclinical part of the study course "Preprosthetic Surgery" requires that the student is able to choose the right method of implantation and performs dental implantation in an artificial jaw; and successively, in the clinical part of the course the student will do clinical case planning and surgical treatment and prosthetics to a patient. The first study course devoted to this topic in the study programme "Dentistry" is "Biomaterials in Dentistry", which students undertake during the second semester of the first year of study in the amount of one credit point. This study course is taught at the Department of Physics in cooperation with the lecturers involved in the dentistry programme. On completion of the study course, students will have acquired the competence to evaluate physical properties of biomaterials and their use. The learning outcomes suggest that students will use the terms used in physics correctly, including those related to biomaterials; will describe the properties of biomaterials and the physical processes that characterise them; will define methods for determining the physical properties of biomaterials; will have acquired skills to describe the regularities of the deformation theory for the comparative characterisation of the mechanical properties of different biomaterials and will be able to predict the behaviour of biomaterials under the influence of various factors (static and dynamic load, changes in

external factor parameters). The study course "Biomaterials in Dentistry" is planned in the format of four lectures and two practical classes with a final examination in the form of a semester test on biomaterials.

The table shows that successful learning of the four study courses included in the Cariology direction leads students to the acquisition of the study courses "Paediatric Therapeutic Dentistry I" and "Therapeutic Dentistry" during the 4th year of study, where the learning outcome is to evaluate the correlations and integrate the knowledge acquired in other medical and dental sectors into diagnosing, prognosticating and treating caries, pathology of hard dental tissues and pulpal and periodontal pathology both in children and adults, which means that they are able to clinically accept and treat patients. Whereas, successful completion of the study courses of the four main areas allows the student to achieve successively the level of the fifth year of study, which includes the study course "Integrated Dentistry" and the learning outcome is to evaluate the patient's dental health in general and provide all the necessary treatment according to their level of competence: complete full diagnostics, develop a treatment plan and complete the treatment successfully. Thus the achieved result by the student conforms to Article 1.58.3 of the occupational standard regarding the professional competence needed for carrying out the professional activity (National Centre for Education, 2012).

In the mapping process, when analysing the use of the concept *biomaterials*, it was found that different concepts were used in the study course descriptions: *various filling materials, sealing with various materials, available materials, applicable materials*. Therefore, the interviews clarified the industry experts' understanding of the concept of biomaterials and its place in a larger thematic block.

In discussing the mapping results with the Head of the study programme and the leader of the study course "Biomaterials in Oral and Maxillofacial Surgery", the viewpoint was expressed that a deeper analysis was needed to improve the proportional distribution of the content in the study programme and to achieve a more successive and systemic acquisition of the learning outcomes, taking into account the fact that six RSU departments and at least 51 lecturers are involved in the implementation of the topic *biomaterials*. Large number of the involved lecturers demands a unified conception of the content implementation. During the discussion, the Head of the study programme noted that a number of individual conversations with students took place in the previous academic year and the opinion of students on the necessity to improve the content acquisition was expressed.

Analysing the data obtained in interviews and the focus group, it can be concluded that the opinion of both lecturers and students on the definition

of *biomaterials* coincides with that defined in the theoretical literature. Colleagues emphasized that they are materials that are compatible with the human body and their diversity is very wide, as well as drew attention to the fact that each area of dentistry has its own material specificity and different types of biomaterials, for example, one type of biomaterials may be used in oral, facial and jaw surgery, but other biomaterials in periodontology and endodontics.

> *"...We have divided into very small sections, each course in dentistry speaks about its kind of biomaterials...there is enormous number of materials, each specific case requires its own material, therefore creating a special course devoted to biomaterials would be quite useless."*

All respondents, both lecturers and industry experts and students, agree that the topic *biomaterials is very topical.*

> *"..Very topical. In my opinion, the most topical subject in medicine, because we will use them in prosthetics, implantation.. we can help people more and more."*

Considering that the research and use of biomaterials in medicine have been developing rapidly, lecturers follow the latest trends in this field and include this content in their study courses by improving prosthetic techniques and devices, studying interactions between implants and biological tissues, and so on (Bruschi et al., 2015). However, both lecturers and students admit that not all study courses are currently fully implemented. Students particularly emphasize that they would like to have general study courses that are more focused and more directly linked to dentistry, and in general it is essential to work continuously towards systemically integrating the most topical and latest achievements of the sector into the programme.

In a number of quotes, the students reveal the latest developments in the sector related to biomaterials. *"..we could talk about the biological contact between the tissue and prosthesis; look at their cross-section, as well as the interaction between the implants and biological tissues, which would also be useful for us later in surgery."*

Some lecturers particularly emphasize succession in learning the content.

> *"..there are study courses where the topic is discussed at the theoretical level, then the students go to the preclinic and logically the information is supplemented, and in the clinic, too... (..) we need to know what to use.."*

Students also acknowledge the importance of gradual and successive acquisition of knowledge and skills; emphasize the importance of relevance of the scope of the content, accurate selection of the content and linkage with the practice.

"..to learn not about all the possible materials in dentistry, but only about the specific materials we will use in prosthetics, such as linking the materials with the real situation in the patient's mouth, and there are thousands of different adjustments that will have to be considered. It would help, if we more analysed clinical cases."

For the improvement of succession, lecturers and students recommend reviewing the place of the study course "Biomaterials in Dentistry" within the study programme. At present it is included in the 1st year of study together with the content of medical physics and the students have the next contact with this topic only in the 3rd year of study, which makes it difficult to learn the content continuously and consolidate it successively.

"..He learns some sort of theoretical formula, something which is isolated from real life, and then either he learns or does not learn, remembers or does not remember, because at that point it was not important for him and later it is difficult or even impossible to link".

Industry experts admit that the leader of each study course individually makes improvements in the study course, but more careful work is needed in interdisciplinary collegial harmonisation of the content, because mutual cooperation between lecturers is a prerequisite for the preparedness of students to work in the clinic. This is also confirmed by the data obtained from pedagogical observations.

"..we improve the study course every year because we notice some inaccuracies or we realise how we can better teach it"; "..we have not coordinated the biomaterials content among ourselves…"

Both lecturers and students aim to improve the content and process of studies to the search, analysis and use of scientific research, closer links between theory and practice, so that the student can understand the practical applicability of knowledge as early as possible: preparation of biomaterials, testing of physical properties and compatibility with biological tissues.

"..I would be interested, if we are talking about the properties of materials, such as the load resistance or wear, then I would like to test it practically with biomaterials, because it will be important for me to explain it to the patient."

The results of the study demonstrate the importance of research on biomaterials content in the study programme of dentistry. The mapping of study courses and interviews with the educational actors involved in the study programme have allowed to discover the nature and amount of the biomaterials content to be learned, succession, interconnection at

the level of study courses and the relevance of the topics to major research worldwide. The results obtained are conceptualised and communicated in various target groups and the plan for the improvement of the study programme is based on them.

Conclusions

The analysis of the results obtained leads to the conclusion that:

1. The biomaterials theme is very topical in the study programme "Dentistry" and its significance is ascertained to have a tendency to increase;
2. Balanced distribution of biomaterials content in the study programme is needed to ensure more successive and systemic acquisition of study results;
3. To foster students' readiness to work with biomaterials in a clinic, improvement in cooperation of the faculty is necessary which would facilitate the appropriateness of the specific content to Dentistry sub-sectors.

The following recommendations are put forward for a meaningful analysis and improvement of the quality of the study process:

1. To improve and organize a regular, systematic communication and cooperation among the stakeholders, to produce a 360^0 feedback – from lecturers, students, management, support staff and industry representatives;
2. To come to an agreement on common understanding and use of concepts;
3. Based on mapping results, to come to an agreement on meaningful and successive integration of biomaterials content in theoretical, pre-clinical and clinical study courses;
4. To ensure that each course is based on previously acquired knowledge and complements it with the subject-specific content, but does not repeat the previously acquired content;
5. To update biomaterials content according to the latest research.

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EXPLORING POSSIBILITIES OF TRANSFORMATIVE LEARNING IN CONTINUING MEDICAL EDUCATION: A LITERATURE REVIEW

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ABSTRACT

Changes are inevitable part of all walks of life; adults from different professions more often than ever face new challenges when previous knowledge, skills and attitudes are ineffective. Transformative learning approaches could be of a great value in order to foster changes within a person – necessity in contemporary world. It is also true for medicine and medical professionals. However, longstanding traditions of medical education have established fundamentals, like, reliance on individual's professional performance rather than teamwork; sanctity of hardly acquired knowledge and fixed techniques rather than learning from error and continuous improvement.

As an adult educator himself, the author of this paper is interested in transformative learning possibilities within field of continuing medical education. By conducting a literature review the author seeks to answer the following question: what is the scope and the nature of research and studies devoted to transformative learning in continuing medical education? As a result of three tiers of search queries, 16 articles have been included in the literature review.

Main ideas of the studies reviewed are discussed in this paper. Several strains can be recognized: Operational level of introducing transformative learning in continuing medical education; Conceptual (theoretical) frameworks of possible introduction of transformative learning within continuing medical education; Transformative learning within under-graduate or graduate study context; Importance of self-monitoring and self-reflection of medical professionals; Importance of continuing medical education to adopt new teaching and learning approaches.

Keywords. Transformative learning; Continuing medical education; Literature review.

Introduction

Adults from different professions more often than ever face new challenges when previous knowledge, skills and attitudes are ineffective.

Transformative learning, according to the author of the transformative learning theory, Jack Mezirow, is "learning that transforms problematic frames of reference – sets of fixed assumptions and expectations (habits

of mind, meaning perspectives, mindsets) – to make them more inclusive, discriminating, open, reflective, and emotionally able to change" (Mezirow, 2003, 58). Such an approach could be of a great value in contemporary, changing world.

There are hopeful expectations that education systems now from pre-school to university levels incorporate at least basic principles of transformative learning in order to prepare students for their upcoming life, also known as VUCA world. It is also true for medicine and medical professionals. However, for those already grounded in their profession for years there is additional challenge: longstanding traditions of medical education have established fundamentals, like, reliance on individual's professional performance rather than teamwork; sanctity of hardly acquired knowledge and fixed techniques rather than learning from error and continuous improvement.

Continuing professional development, namely, continuing medical education is the branch where, according to the believe of the author of this paper, it is important to introduce and to strengthen ideas of transformative learning, thus improving performance of medical professionals and ultimately, outcomes for patients.

What is done so far? In order to learn recent developments of transformative learning in the field of continuing medical education, author of this paper decided to conduct respective literature review.

Searching tool, strategies, and results

Searching tool deployed for the research was Primo Discovery service provided by ExLibris Group (a ProQuest Company) for University of Latvia. It is an effective tool for discovery and delivery information resources as it runs simultaneous search within all databases (Table 1) accessible for author's Alma Mater.

Table 1. List of databases accessible for University of Latvia (as on June 1, 2019)

Name of database
Dawsonera
EBSCO
EBSCO Central & Eastern European Academic Source
Emerald
JSTOR
LETA
LETA – Arhīvs

Name of database
Letonika
Nozare.lv
OECD iLibrary
Oxford Journals
ProQuest Dissertations & Theses Global
ProQuest Ebook Central
Researcher ID (Thomson Reuters)
SAGE Journals Online
SAGE Research Methods
ScienceDirect
Scopus
SpringerLink
Taylor & Francis Social Science & Humanities Library
Times Higher Education
Web of Science

Two main key phrases for this research are: "transformative learning" and "continuing medical education", so they were used in the search query, looking for both phrases in *subject* field.

Search query 1 (Figure 1) revealed 6 results. All of them are articles in English from peer-review journals, published from 2007 to 2009. Although all six indicated having full text online, none of full texts were accessible for the author.

Figure 1. Screenshot of Primo search entry page (search query 1)

Such an exclusive list of articles (Galbraith, et al. 2008; Ranson, et al., 2007; Mcwilliam, 2007; Dornan, 2008; Epstein, et al., 2008; Sargeant, 2009) seemed an underestimate of the topic, also given the fact that all six sources come from the same journal. So, author of this paper decided to expand search query, allowing phrase "continuing medical education" to be searched within any field.
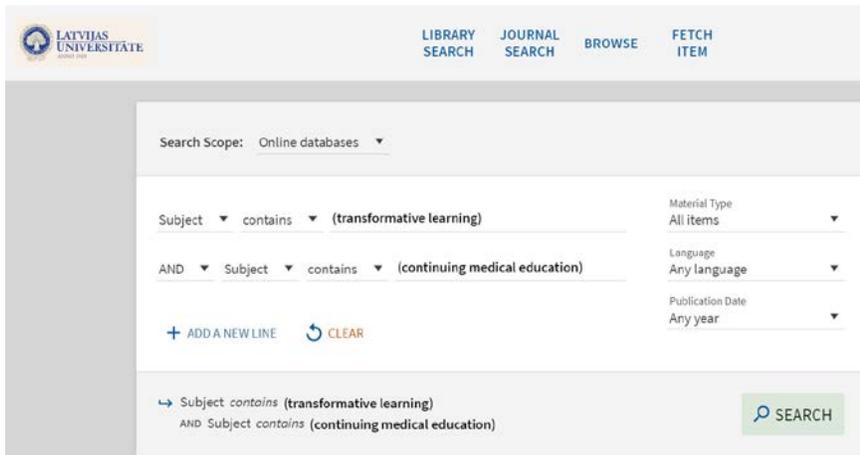

Figure 2. Screenshot of Primo search entry page (search query 2)

Search query two (Figure 2) revealed 40 results. All of them are articles in English from peer-review journals, published from 2007 to 2019. Thirty-three full-text sources out of 40 were accessible for the author of this paper. Six of non-accessible items were duplicates of search query one.

As next, analysis of keywords and summaries of those articles was performed. Looking for articles containing *medic** or *nurs** in their keywords or summaries revealed 14 articles (including previously found 6 articles in search query one).

List of these results are displayed in Table 2, citing articles along with their subjects / keywords and number of other articles citing them.

Table 2. Narrowed list of articles revealed by search query Two (filtered for *medic** or *nurs** in their keywords or summaries)

Article	Subjects / Keywords		Number of articles citing this source[1]
Epstein, R., Siegel, D., & Silberman, J. (2008).	Physicians Cognitive Psychology Cognitive Style Metacognition Medical Education Self Evaluation (Individuals) Clinical Experience Transformative Learning	Neuropsychology Science Process Skills Professional Continuing Education Self Management Medicine Education	51
Sargeant, J. (2009).	Professional Continuing Education Interprofessional Relationship Interdisciplinary Approach Social Theories Learning Theories Medical Education	Health Personnel Transformative Learning Social Psychology Systems Approach Communities of Practice Reflection Medicine Education	36
Mcwilliam, C. (2007).	Educational Change Transformative Learning Health Personnel Active Learning Professional Continuing Education Medical Research Research Utilization	Health Services Organizational Culture Theory Practice Relationship Postsecondary Education Educational Innovation Medicine Education	21
Galbraith, R., Hawkins, R., & Holmboe, E. (2008).	Medical Education Lifelong Learning Program Improvement Professional Continuing Education Relevance (Education) Change Strategies	Program Effectiveness Metacognition Cognitive Style Transformative Learning Self Evaluation (Individuals) Medicine Education	13
Ranson, S., Boothby, J., Mazmanian, P., & Alvanzo, A. (2007).	Medical Education Physicians Access to Information Program Effectiveness Use Studies Decision Support Systems Information Technology Portfolio Assessment	Interviews Questionnaires Transformative Learning Professional Continuing Education Medicine Education	12

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[1] Number of other articles citing source are subject to change. Number reflected in the table has been fixed at the time of preparing this paper.

Article	Subjects / Keywords		Number of articles citing this source[1]
Adamshick, & August-Brady. (2012).	RN-BS Students Cultural Immersion	Phenomenology Transformative Learning	9
Mcallister, M. (2011).	Critical Reflection Transformative Education	Transformative Learning Education	7
Brendel, W. (2009).	Transformative Learning Narrative Medicine Clinical Dialogue	End-of-Life Care Education	6
Macdonnell, J., & Macdonald, G. (2011).	Transformative Learning Arts-Based Education	Critical Reflection Education	6
Dornan, T. (2008).	Medical Education Medical Students Self Evaluation (Individuals) Foreign Countries Professional Continuing Education Certification Technology Integration	Intellectual History Educational Development Transformative Learning Self Management United Kingdom Medicine Education	5
Moon, P. (2008).	Death Grief Terminal Condition	Transformative Learning Medicine	4
Mcallister, M. (2015).	Change Critical Theory Curriculum	Nursing Education Transformative Learning	3
Sokol, R. G., & Shaughnessy, A. F. (2018).	Continuing Education Educational Evidence–Based Medicine	Learning Models Qualitative Research Transformative Learning	1
Mcallister, Levett-Jones, Petrini, & Lasater. (2016).	Transformative Learning Ethical Comportment Film	Teaching Strategy Nursing Students	1

There was also the third search query performed in order to make certain not to miss any other applicable article: keeping phrase "continuing medical education" in *subject* field and looking for phrase "transformative learning" in *any* field.
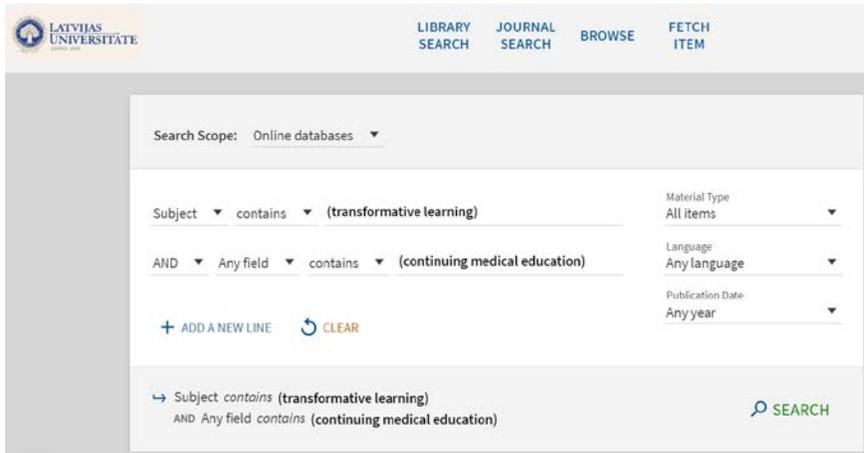
Figure 3. Screenshot of Primo search entry page (search query 3)

Such search query revealed 33 items. Refining by *English language* and *Peer-reviewed* categories made list of 27 items. Again, six of them were the same duplicates as in search queries one and two. The remaining 21 items were filtered by looking for *transformative learning* within their abstracts / notes. It resulted in finding 2 articles (Table 3).

Table 3. Additional matching articles after search query three

Article	Subjects / Keywords		Number of articles citing this source[2]
Skipper, M., Musaeus, P., & Nahr, S. (2016).	Continuing Medical Education – Research Patient Care – Research	Ambulatory Care Facilities – Research	16
Holmboe, E. (2008).	Education Medical Continuing	Assessment Physicians-In-Practice Quality Of Care	5

As a result of three search queries applied, there are 16 articles found and included in further review. Nine full texts were accessible for the author at the time of preparation of this article; for other seven – abstract level information was analysed.

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[2] Number of other articles citing source are subject to change. Number reflected in the table has been fixed at the time of preparing this paper.

Discussion

For transformative learning to happen, there is absolute necessity of self-conscious meta-cognitive processes to take part. This is acknowledged challenge for medical educators, for instance, in most cited article (of those included in this literature review) about physicians' self-monitoring in clinical practice (Epstein, et al., 2008). It is stressed that self-monitoring is an important component of the professional competence of physicians. Also – thinking of "facts" as conditional, experiencing information as novel, seeing situations from multiple perspectives, suspending categorization and judgment, and engaging in self-questioning – are contrasted to being on" automatic pilot" or "mindless" in physicians' behaviour (Epstein, et al., 2008). Theoretical point is clear; however, how it could be fostered operationally in continuing medical education, is not discovered.

Another example of concise, still, theoretical conclusion is the one requiring continuing medical education to adopt new content, recognize new knowledge, and use new approaches for learning in order to strengthen interprofessional education (Sargeant, 2009). What one could find missing, is place and experience of actual participants of continuing medical education events designed for interprofessional collaboration.

Answer to that, at least, partly, can be found in another article promoting transformative knowledge translation (Mcwilliam, 2007). The article presents theory-based strategy for continuing medical education where clinicians are engaged in an on-the-job process of developing a deeply felt interest in research findings relevant to everyday practice, as well as ownership of that knowledge and its application (Mcwilliam, 2007). The role of continuing educator is described quite clear, and even missionary – to foster a learning organization culture across the institution; the role of learner is a bit inscrutable.

Right to the point of learner's perspective are Galbraith, et al., (2008). They acknowledge that although self-assessment is an important mechanism for lifelong learning and self-improvement for health care professionals, however, there is growing concern that individual learners often interpret the results inaccurately. In the course of the article they prove that self-assessment can and should be made more effective. They believe that impact should be reinforced by linking the results of self-assessment to subsequent learning activities including continuing medical education (Galbraith, et al., 2008).

A bit distant from previous, still in connection to self-assessment is review of use of personal digital assistants (PDAs) by practising physicians (Ranson, et. al., 2007). Among the value of PDAs in accessing information for making clinical decisions and for patient education, PDA use for learning portfolio

intended to encourage documentation of reflection on practice and medical education was mentioned. It is remarkable that they mention: "Access to information is important, but it is not a predictor of change. Reflection, as a form of mental processing, allows physicians to make information and knowledge more meaningful" (Ranson, et. al., 2007, p. 229).

The difference between 'continuing medical education' and 'continuing professional development' is stressed in "Self-Assessment in CPD: Lessons from the UK Undergraduate and Postgraduate Education Domains" (Dornan, 2008). Dornan argues that continuing professional development explicitly links education to change in practice and gives self-assessment (especially in the form of reflection) a central place in personal development. In the abstract of the article is said that it considers how a positive system of self-assessment and professional self-regulation could be operationalized (Dornan, 2008), so it is even more unfortunate that the author of this review did not have access to the full text.

Assessment of the practicing physician is also discussed in Holmboe's respective article (Holmboe, 2008). There are two forces highlighted: pressure to change the nature of continuing medical education and pressure to hold individual physicians more accountable for the care they provide. Holmboe argues that comprehensive physician assessment provides such an opportunity, and many assessment methods and tools exist that can facilitate the integration of continuing medical education and quality. Holmboe writes: "Using a multifaceted physician-level performance assessment system has substantial potential to align the public's need and desire to ensure their physician is competent, at a minimum, with providing the physician with meaningful, actionable information and data to improve performance and engage in transformative learning" (Holmboe, 2008, p.4). However, it was not possible for the author of this review to explore how exactly Holmboe suggests physicians to engage in transformative learning or other aspects of continuing medical education.

Transformative learning example is described through cultural immersion experience for nursing students in Adamshick & August-Brady (2012). It is convincing that there are positive short- and long-term effects on the personal and professional lives of the participants after week-long immersion; however, it's possible translation to continuing medical education is not so clear.

Another article mainly devoted to nursing study process is discussing Transformative Learning Framework for nurse educators (Mcallister, 2011). Although continuing medical education is not explicitly mentioned in the article, several main ideas could be 'borrowed' for implementation as well in continuing medical education. Like, for educators to allow those learning to experience disorienting dilemmas rather than protect from these.

It is valuable because can become a trigger for deep learning, reflection and arriving at new understandings, thus better equip learners for future practice and for the advancement of the profession (Mcallister, 2011).

An interesting example of transformative learning is found in an article describing Change Laboratory intervention to implement changes in paediatric outpatient clinic (Skipper, et al., 2016). Although it doesn't claim itself to be continuing medical education example (in its most often used sense), it pictures a great example of workplace learning. Indeed, – "because the cultural and technological practice of a medical department constantly change, medical researchers and practitioners need tools to analyse and intervene in a department's practice of care and continuing education" (Skipper, et al., 2016, p. 2).

There is only one study capturing the lived experience of attendees of a continuing medical education course (Sokol & Shaughnessy, 2018). It is done using hermeneutic phenomenological approach through individual interviews, focus groups, and observations. It is underlined that for behaviour change to occur, participants often need to consciously reject previous ideas and transform their way of thinking. Indeed, participants of this study described how taking part in the continuing medical education course evoked strong emotional responses, facilitated personal transformation, and propelled expedited behaviour change resulting in a newfound sense of self-efficacy, confidence, and ownership in their ability to make medical decisions. It is concluded that transformative learning opportunities would promote translation into practice if learners are supported while going through personalized meaning-making process (Sokol & Shaughnessy, 2018).

Among others, an article found to be very informative, even if not seen as such from the surface, is Brendel's Framework for narrative-driven transformative learning in medicine (Brendel, 2009). Superficially looking, it talks about patient learning experiences and puts clinician into role of teacher. However, there is a thread throughout the article aiming to show almost endless possibilities for clinicians to learn themselves. One could argue that there is no reference to continuing medical education in the article. Yes, it's true; however, touching the thread opens understanding that clinicians are learning every day together with their patients. For instance, "With each grave prognosis, health care practitioners themselves should strive for a deeper understanding (..). Maintaining a learning journal will not only inform subsequent encounters with dying patients but may also be shared effectively in communities of practice within hospitals and similar institutions" (Brendel, 2009, pp. 40–41).

Likewise, conversations between physicians and their patients concerning terminal conditions are seen as transformative learning source

in Moon's article (Moon, 2008). Acknowledging that such encounters comprise complex grief dynamics, they are also described as opportunities for personal insights for physicians, and their more authentic presence. Transformative learning is emphasized throughout the article, although not always mentioning the term itself, e.g., saying that physicians' commitment to a lifelong agenda of refining their world-view orientation is crucial (Moon, 2008).

Transformative changes are possible if we consciously acknowledge them. Why don't make it part of continuing medical education?

Challenges are clearly stated in the article discussing arts-based critical inquiry in nursing and interdisciplinary professional education (Macdonnell & Macdonald, 2011): (a) many competing priorities within contemporary competency-based professional curricula; (b) processes, which foster construction of knowledge and relationships among learners, affirming emotional dimensions of learning and cognitive uncertainty, are in direct contrast to the prevailing view of critical inquiry in health professions (nursing, medicine); (c) although many educators have employed narrative and other arts-based approaches to address diversity and interpersonal relationships, this approach is not always visible in mainstream professional education; (d) interactive small group learning contrasts sharply with superficial and strategic learning which are often the default learning modes in medical education (Macdonnell & Macdonald, 2011).

Margaret McAllister, nursing teacher, shares her vision for nursing educators to come together in communities of practice to talk about the challenging aspects of nursing and ways these challenges can be reframed and reapproached through education. She clearly states that her vision is underpinned by the pedagogy of Transformative Learning. In her article she discusses the courage necessary to teach a values-based curriculum. Arguing the value of a pedagogy for nursing that moves beyond a preoccupation with techniques and medical knowledge, she also does not dismiss this learning (McAllister, 2015). It would be interesting to find out her views regarding continuing medical education, what has not been of special attention in reviewed article.

However, there is another publication co-authored by McAllister (McAllister, et al., 2016), where they discuss implementing learning experiences that challenge nursing students to think deeply and broadly about the experiences they encounter, to question their previous assumptions and prejudices, to consider the world of healthcare through a new lens, and to reflect on and learn from the process. There is presentation of film exemplars and related teaching strategies designed to facilitate transformative learning and development of ethical comportment in the article (McAllister, et al., 2016). Although continuing medical

education is not explicitly mentioned, motivated educator could find at least inspiration for possible use of methods described in the article also in continuing medical education.

Conclusion

There were 16 articles reviewed in order to find out the scope and the nature of research and studies devoted to transformative learning in continuing medical education.

Characteristics of articles included in this literature review:

Language	–	English
Peer-reviewed	–	yes
Published (years)	–	2007–2018

There was substantial motivation to carry out this literature review for the author being adult educator working in continuing medical education and recently growing his own interest in transformative learning.

The first finding is surprising: there are only few studies clearly stating both – *transformative learning* and *continuing medical education* – as their keywords. (Anecdotally, none of those were accessible in full text for the author.)

Although it was expectation to find more studies discussing operational level of introducing transformative learning in continuing medical education, it was only one article found capturing the lived experience of attendees of a continuing medical education course: Sokol & Shaughnessy (2018). A bit distant from that, with possible practical implications, is study where participants were encouraged to use personal digital assistants also for documentation of reflection on practice and medical education (Ranson, et. al., 2007), and example of workplace learning involving elements of transformative learning (Skipper et al., 2016).

Conceptual (theoretical) frameworks of possible introduction of transformative learning within continuing medical education are discussed in several studies (Mcwilliam, 2007; Mcallister, 2011; Brendel, 2009).

Some of studies are depicturing transformative learning within under-graduate or graduate study context, mainly – in nursing (Adamshick & August-Brady, 2012; Mcallister, 2011; Macdonnell & Macdonald, 2011; McAllister, 2015; McAllister, et al., 2016).

There are studies highlighting the importance of self-monitoring and self-reflection of medical professionals for transformational learning to take place (Epstein, et al., 2008; Galbraith, et al., 2008; Ranson, et. al., 2007; Holmboe, 2008). Some of them are courageous enough to admit

that individual learners might interpret self-assessment results inaccurately (Galbraith, et al., 2008); others highlighting patient learning and subsequently – physician learning (Brendel, 2009; Moon, 2008).

Another strain of studies underlines importance of continuing medical education to adopt new teaching and learning approaches (Sargeant, 2009; Dornan, 2008; Macdonnell & Macdonald, 2011; McAllister, 2015; McAllister, et al., 2016), even suggesting 'continuing professional development' as more accurate term instead of 'continuing medical education' (Dornan, 2008).

In conclusion let me quote one of the articles reviewed: "Creating spaces for collective dialogue and deep reflection seems more urgent than it has ever been" (Macdonnell & Macdonald, 2011, p. 217). Now this seems to be appropriate slogan for transformative learning to be introduced more into continuing medical education.

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