DisCo 2017: Open education as a way to a knowledge society

12th conference reader

Jan Beseda, Lucie Rohlíkova and Jan Baťko (Eds.)

2017 by Centre for Higher Education Studies, Prague

Creative Commons CC-BY-SA-33.0

ISBN 978-80-86302-82-9

Reviewers

Prof. Dele Braimoh, ex UNISA, South Africa
Mar Camacho Martí, Ph.D. Universitat Rovira i Virgili in Tarragona, Spain
PhDr. Branislav Frk, Ph.D., University of Prešov, Slovakia
Francesco Pisanu, Ph.D., IPRASE, Italy
PhDr. Lucie Rohlíková, Ph.D., West Bohemia University, Czech Republic
Monika Frania, Ph.D., University of Silesia in Katowice, Poland
Miguel Gea, Ph.D., University of Granada, Spain
Mari Carmen Caldeiro Pedreira, Ph.D., Public University of Navarra, Spain
Dr. Mohammed Ibrahim Alhojailan, Ph.D., DMU University, CCSR. United Kingdom, King Saudi University, Saudi Arabia
Mgr. et Mgr. Jan Beseda, Ph.D., Centre for Higher Education Studies, Czech Republic
Mgr. Hana Ovesleová, Ph.D., Charles University, Czech Republic
Mgr. Jakub Štogr, Navreme Boheme, s.r.o., Czech Republic
Robert Aust, Universität Leipzig, Germany
Miltiadis D. Lytras, Ph.D., The American College of Greece, Greece
Mgr. Linda Pospíšilová, University of Pardubice, West Bohemia University
Paraskevi Papadopoulou, Ph.D., The American College of Greece, Greece
Anastasia Misseyann, Ph.D., The American College of Greece, Greece
Mgr. Veronika Neničková, Masaryk University, Czech Republic
Christina Marouli, Ph.D., The American College of Greece, Greece
Alicia Peñalva, Ph.D., Public University of Navarra, Spain
MSc. Lynette Naidoo, UNISA, South Africa

Cover graphics

Hana Ovesleová

Publication is not a subject of language check.

All papers passed a blind review process.

Content

Introduction 1-3

Articles

Keynote speech

ANASTASIA SYZENKO: CATCHING THE WAVE: CHALLENGES AND OPPORTUNITIES OF TECHNOLOGY-ENRICHED LEARNING 6-12

Methodologies

JAN BAŤKO: METHODICAL SUPPORT FOR TEACHERS OF ROBOTICS IN THE CZECH EDUCATIONAL SYSTEM 14-23

FRANCESCO PISANU, LISA FREISE: EFFECTS OF ICTS' TRAINING FOR TEACHERS IN PRIMARY SCHOOL ON STUDENTS' COMPETENCIES, MOTIVATION AND PERCEIVED CLASSROOM CLIMATE 24-39

LENKA BENEDIKTOVÁ, JAN KRÁL: STILL LIVE LEGACY OF B. F. SKINNER: PROGRAMMED LEARNING ELEMENTS IN THE CURRENT APPLICATIONS FOR CHILDREN 40-56

DUŠAN KOSTRUB: THE CREATION VIDEO - EXAMPLE OF CONSTRUCTIONISM IN THE LEARNING AND TEACHING PROCESS 57-65

Open Access

OKSANA ZAMORA, TETIANA KHVOROST, NATALIA KLIETSOVA: ENHANCING KNOWLEDGE SOCIETY CONCEPT VIA EDUCATIONAL PROJECTS 67-86

IVA JEDLICKOVA: POTENTIAL OF LIBRARIES IN OPENING THE ACCESS TO LIFELONG LEARNING 87-92

OLHA ZHORNOVA, OLENA ZHORNOVA: THE MAIN CHALLENGES TO OPEN EDUCATIONAL RESOURCES IN UKRAINIAN CONTEXT 93-116

Media and information literacy

TAMÁS BOKOR: MEDIA AND CORRUPTION: POTENTIALS OF NEW MEDIA IN SENSITIZATION 118-125

MONIKA FRANIA, WIOLETTA HADZIK: MEDIA LITERACY OF A CHILD AT AN EARLY SCHOOL AGE FROM THE PERSPECTIVE OF TEACHERS, PARENTS AND PERSONS PREPARING TO BECOME EDUCATORS 126-137

MICHAL ČERNÝ: INNOVATION OF THE COURSES OF INFORMATION LITERACY AS A WAY FOR OPENNESS, PERSONIFICATION AND COMPETENCIES 138-151

SEJDI SEJDIU: MEDIA LITERACY EDUCATION TOOL FOR KNOWLEDGE SOCIETY 152-159

Pilots traning

IGOR ČERNÁK, DANIEL POLČIN, RÓBERT JANIGA: RESEARCH AND PROPOSAL OF THE NEW TRAINING METHODOLOGY FOR AIRCRAFT SPECIALISTS 161-179

RÓBERT JANIGA, MICHAL ROJČEK, IGOR ČERNÁK: PRACTICAL EXPERIENCES WITH LEARNING MANAGEMENT SYSTEM MOODLE IN AVIATION TRAINING 180-185

DAVID ŠOUREK: IMPLEMENTATION OF COMPUTER BASED TRAINING INTO BASIC PILOT LICENSE COURSES 186-193

Languages teaching and learning

SEJDI SEJDIU: IMPACT OF GLOBALIZATION ON LANGUAGE STATUS AND DEVELOPMENT 195-201

EVA RAKOVSKÁ: IMPROVEMENT OF TESTING BY USING LEARNING MANAGEMENT SYSTEM MOODLE 202-216

DANA ZERZÁNOVÁ, IVANA ČECHOVÁ, JANA BERÁNKOVÁ: BLENDED LEARNING AS EFFICIENT METHOD OF LANGUAGE ACQUISITION 217-228

JANA VEJVODOVÁ: THE USE OF VIDEO RECORDINGS OF MICROTEACHING IN CZECH LANGUAGE DIDACTICS LESSONS 229-244

IRYNA SEKRET: ENHANCING DEVELOPMENT OF THE PRE-SERVICE TRANSLATORS' PROFESSIONAL COMPETENCES VIA THE PROJECT WORK: A CASE STUDY 245-263

YANA FABRYCHNA: BILINGUAL E-GLOSSARY OF FOREIGN LANGUAGES AND CULTURES TEACHING (ENGLISH AND UKRAINIAN) 264-272

IRYNA DIDENKO: GAME-BASED LEARNING IN ENGLISH FOR SPECIFIC PURPOSES CLASSROOM 273-278

YANA DIACHKOVA: INTEGRATION OF COMPUTER-MEDIATED COMMUNICATION INTO ENGLISH FOR SPECIFIC PURPOSES TEACHING AND LEARNING: PRACTICAL ASPECT 279-287

LADISLAVA KNIHOVÁ: THE CHALLENGES OF MOBILE-APP-BASED FOREIGN LANGUAGE TEACHING AND LEARNING 288-300

Education Tools

TEREZA HAVRÁNKOVÁ, MARCELA KRAUZOVÁ: SHOWBIE: A TOOL FOR SHARING CONTENT 302-312

CHRISTINA MAROULI, ANASTASIA MISSEYANNI: SHARING KNOWLEDGE IN HIGHER EDUCATION: COLLABORATIVE TEACHING, COLLABORATIVE LEARNING AND ICTS 313-322

JAN KROTKÝ, KATEŘINA BAMBASOVÁ: USER PREFERENCES OF ELECTRONIC TEXTBOOKS WITH REGARD TO THE DIDACTIC COMPONENTS AND ORIENTATION IN STRUCTURE OF THE TEXTBOOK 323-334

LILLA KORENOVA: USE OF MOBILE TECHNOLOGY IN VARIOUS DIDACTIC SITUATIONS IN MATHEMATICS EDUCATION IN PRIMARY SCHOOL 335-352

ŠTĚPÁNKA HRONOVÁ: DIGITAL SUSTAINABILITY REPORTING IN THE ERA OF KNOWLEDGE SOCIETY 353-359

ALEXANDRA HRUŠKOVÁ: BUSINESS MODELS OF MOOCS IN 2017 360-365

ZBYNĚK FILIPI, LUCIE ROHLÍKOVÁ: PRE-SERVICE TEACHERS AND TECHNOLOGY ENHANCED SCHOOL PROJECTS 366-374

PETR SVOBODA, PAVEL ANDRES: USE OF TABLETS IN TEACHING 375-385

LINDA POSPISILOVA: TOWARDS AUTONOMOUS LEARNING WITH EPORTFOLIO EVIDENCE 386-383

TOMÁŠ KUBÁLEK, MARKÉTA KUBÁLKOVÁ: E-LEARNING EDUCATION SUPPORT 393-401

TOMÁŠ JACKO, JANA JACKOVÁ: THE USE OF AROPÄ PEER-REVIEW SYSTEM IN THE UNIVERSITY COURSE ETHICS, CORRUPTION AND TRANSPARENCY 402-419

BEKIM BEKA, ARLINDA BEKA: THE LACK OF ELECTRONIC THESIS AND DISSERTATIONS (ETD) DATABASE AND ITS IMPACT TO DOING RESEARCH IN KOSOVO'S UNIVERSITIES 420-429

MILTIADIS LYTRAS, PARASKEVI PAPADOPOULOU: VIRTUAL REALITY SYSTEMS FOR INTRODUCTORY BIOLOGY LABS: AN INTEGRATED SURVEY OF INDUSTRY SOLUTIONS 430-445

RADKA HAMŘÍKOVÁ, DAGMAR DLOUHÁ: VIDEO TUTORIALS FOR STUDENTS OF THE MASTER'S PROGRAM 446-451

PERO SPASOJEVIC, MIRJANA SAMARDZIC, MARICA TRAVAR: COLLABORATION OF PARENTS AND INSTITUTIONS IN SUPPORT OF PROPER DEVELOPMENT OF PRESCHOOLERS 452-468

EVDOKIYA PETKOVA, VASILA PAVLOVA: INNOVATIVE TECHNOLOGIES IN EDUCATING STUDENTS AS A MOTIVATIONAL MECHANISM 469-483

HEDVIGA PETRUŠKOVÁ, MILAN LEHOTSKÝ: APPLICATIONS FOR TEACHING INFORMATICS ON PRIMARY SCHOOLS 484-494

Keynote speaker's abstract

PETRA ACZÉL: VIRTUALLY OPEN EDUCATION? AUGMENTED POSSIBILITIES OF VIRTUAL REALITIES 496

Abstract

LINDA DANIELA, ARTA RŪDOLFA: THE ROLE OF PARENTS FOR DEVELOPING DIGITAL LITERACY OF 0-5 YEAR OLDS 498

Partners 499

Dear readers,

the 12th international conference DisCo 2017: "**Open education as a way to a knowledge society"** was held from 26th June to 27nd June in Prague. We had 3 keynote speakers: Anastasia Syzenko, National University Taras Shevchenko Kiev, Petra Aczél, Corvinius University of Budapest and Irena Bifordová, Director of Education in Microsoft, Czech Republic. Over 90 participants from 15 countries took part in the conference. 26 participants used CEI support for their travel costs. The speakers delivered over 40 presentations. Nearly 90% participants were from CEI countries. For the first time in the history of the DisCo conference our main partner was Microsoft, which hosted the conference in its own building. The conference program was opened by the welcoming speech of Jaroslav Fidrmuc, Deputy Minister of Ministry of Education, Youth and Sport, Czech Republic.

A panel discussion traditionally made an integral part of the conference and it was called: Open Education: The Challenges and Experience**.** The panellists were Anastasia Syzenko, Petra Aczél, Irena Bifordová and Francesco Pisanu, IPRASE, Italy. The panellists defined the following four areas as the most challenging ones for Open Education: 1) Opening minds of teachers and users 2) Quality Assurance of Open Education content and its processes 3) The technological background (fast internet connection accessibility) and 4) funding of Open Education. During the conference were realized 4 workshops which were focused on Microsoft One Note, Office 365, Skype for classrooms and Minecraft as educational tools. The conference participants established new work and personal relationships during the conference.

The first keynote speech was delivered by Irena Bifordová from Microsoft.[1] She talked about how Microsoft looks at educational technologies. The program OneNote and also other programms are designed to facilitate classroom management, resource sharing, and social networking. The second priority relates to work with teachers, it derives from the model where a teacher gets a lot of inspiration and enough resources for building a community of teachers and their targeted support. And last but not least, Microsoft has its own school for high school students where their students learn soft skills or digital competences and also how to use Microsoft programs.

Lucie Rohlíková talked about how the University of West Bohemia prepares teachers for work with technologies for instance using cardboards. An interesting, practically oriented

[1] The description of presentations is based on Michal Černý article: Distance learning conference 2017 a 2015: srovnání témat a řečníků. 27.6.2017 http://bit.ly/2sxJkaf

contribution gives the impression that teachers from Pilsen know how to deal with information technologies.

Linda Pospíšilová presented how she teaches English on the basis of working with the e-portfolio. She uses self-directed learning in a way that every student has to set his or her own goals, the methods to achieve these goals and then they start studying. The learning outcomes are stored in the e-portfolio. Whilst Mahara is still abundantly used, it is advisable to look for alternatives because Mahara is associated with an institution. The contribution pointed to Seesaw, Wordpress or Google Sites. Finally, each student evaluates his or her learning outcomes and processes.

Monika Frania and her student Wioletta Hadzik spoke about media literacy research in Poland. The situation is bleak and parents seem to be in the worst position. One should think about intergenerational learning in the direction from school to children and from children to parents.

The second keynote speaker Anastasia Syzenko mentioned a very interesting idea in her presentation an access to information does not necessarily mean better learning and information does not equal knowledge. She also tackled topics such as sharing, learning on the go, and individualization. She also pointed out that disruption is an indisputable fact and a chance for change. Everything is subject to disruption.

Tereza Havránková presented the Showbie app, which is a free multiplatform and serves to share content and to solve tasks. It is primarily a mobile, light and easy to use app. However, interestingly research has shown that students prefer paper objects to Showbie. It would be interesting to know why.

Petra Aczél, the third keynote speaker, had an interesting introductory lecture on virtual reality. She presented the technology in a wider context, including problems such as a lack of ethical standards, health risks, limited compatibility of individual devices with unprofitable business models, which hamper the progress. At the end of the lecture she outlined the relationship between the possible themes of using the virtual reality in education in the context of constructivist pedagogy. It is very interesting to set a paradigm for utility monitoring. In the paper, research has also shown that university students do not see virtual reality as a platform for knowledge sharing or collaboration, but almost everyone (over 90% participants of the survey) would like to learn in virtual reality.

Jana Vejvodová talked about how they work with microlearning outcomes in preparing teachers in didactic seminars. The students rehears their teaching outcomes (with a length of

15-30 minutes, which is a little bit more than what is usually stated as microlearning), they work in pairs and record themselves on two cameras (one focused on the teacher, the other one on the students). Videos are then uploaded to Moodle, where students can evaluate themselves, but also each other. The combination of self-evaluation and peer assessment is essential for the development of future teachers.

You, dear readers, can discuss about the above mentioned issues and other topics which you can find in our proceedings on our Facebook page https://www.facebook.com/DisCo.Conference/. We are looking forward to your insights, experience and opinions.

In our proceedings you can find abstracts of presentations, and papers based on these presentations, these can stimulate your ideas about using ICT in education and they can help you to better understand current challenges of educators and their students. The papers are classified into the sections by the following topics:

Methodologies, where the papers are mostly focused on methodological approaches

Open Access, where you can find papers about situation in the Open Access Education in Ukraine and how libraries work with Open Access Education approach.

Special section is dedicated to Media and information literacy
This year we have also specific section which deals with Pilot training.

Next section deals with Language learning. There are interesting papers about using video for language training (see Sekret) or using mobile apps in this field (Knihova).

Last section is dedicated to the rest of Education Tools.

I hope that you will find at least some ideas useful for your practice.

Finally, I would like to thank our partners for their sponsorship. First of all we would like to thank Central Europe Initiative as our general partner. We thank Microsoft for being our host, and for delivering very interesting workshops. Our thanks go to AAEI, Association of Adult Education Institutions, Czech Republic, Navreme Boheme s.r.o, Prague Development Center, Veriod and media partner portals Open Education Europa, Edumenu and also to journals Andragogika v praxi, Aula, RicercAzione and Ikaros. Last but not least, we would like to thank all the members of the program and organization committees and our volunteers. Without their help, the organisation of such conference would not be possible.

Jan Beseda

Articles

Keynote speech

CATCHING THE WAVE: CHALLENGES AND OPPORTUNITIES OF TECHNOLOGY-ENRICHED LEARNING

ANASTASIA SYZENKO

Faculty of Economics
Taras Shevchenko National University of Kyiv, Ukraine

e-mail of corresponding author: anastasia.syzenko@gmail.com

Key words: education, technology-enriched learning, learning economy

Abstract: Technology-enriched learning and teaching have been an increasingly important trend among educators for more than two decades now. The rise of Web 2.0 and numerous social media as new collaborative and participatory platforms created a multitude of new opportunities for exploiting online technologies for active learning. Successful application of various digital media can enhance both teaching and learning experience, foster learners' proficiency, promote learners' autonomy and teamwork, and engage students in meaningful and life-related tasks and activities. Moreover, it also challenges learners to explore new technologies and develop their digital media literacy. However, the use of new media in a classroom can only enrich traditional teaching and learning when accompanied by relevant curricular changes. Therefore, teachers all over the world are in their turn expected to actively engage in co-learning and designing tasks that will cater for the needs of the new always connected generation and will facilitate their achievement of specific learning outcomes. The era of open education offers a variety of opportunities to advance educators' digital skills and boost institutional technological capacities. Various options available on this growing market today include unique services and products for educators, ranging from skills development programs for educators to products designed to enable collaboration, sharing and continuous development of skills for students. The challenge lies in ensuring equal access to education for everyone and the opportunities offered by open platforms and an increasing number of educational programs in virtual formats are surely one of the ways to bridge that gap.

Introduction

This papers attempts to take a broader look at the challenges and opportunities of technology-enriched educational practices and analyse their implications for the quality of learning in the modern world. Recent advances in methods of teaching and learning have enriched classrooms all over the world with various types of analogue and digital innovations. Real-world case studies, blended learning, flipped classrooms, maker education, project-based and game-based learning, massive open online courses and many other educational innovations have been transforming the traditional classrooms in order to make learning more effective, life-related, and motivational for the students. Moreover, extensive use of various new technologies and their impact on educational achievements has been drawing attention of scholars, practitioners, employers, and policy makers since 1990s (Daniel 1996, Bates 2000, Nickerson and Zodhiates 2013, Salomon 2016). However, the pace of developments in this area greatly overruns the attempts to analyse its current achievements, making the findings of many empirical studies devoted to particular technologies obsolete long before they get published. By no means does this imply inexpedience of such research, yet it calls for paradigm shift in what and how the future of education and most importantly, learning, is shaped.

Learning is traditionally viewed as a process whose core is the acquisition of competence and skills which lead to greater success in the pursuit of one's own goals or those of one's organisation and the learning economy is the one where the knowledge, or rather rather acqusition of new competences drives economic tranformation and change (Lundvall 2006). Fast-paced economy creates unprecedented demand for skills that lay beyond the traditional mix offered by schools, colleges, and higher education institutions.

This trend in the job market will make many educational institutions and educators reconsider their practices and incorporate more relevant, digitally-advanced techniques into their teaching.

While the gap between the skills people learn nowadays and the skills they need today and will need in the future is widening, traditional approach to learning falls short of providing us with the knowledge needed to succeed, as it was largely discussed at the World Economic Forum 2016. The skills, commonly referred to as 21-st century skills, focus mostly on critical thinking, problem-solving and collaboration whereas 21-st century learning skills (21CLS) include collaboration, construction of learning, real world problem solving and innovation, use of ICT for learning, self-regulation and skilled communication (ITL Research 2012). The main issues I would like to discuss in this paper is whether there is a way for traditional academia to meet the challenge of providing learners with these much needed skills; how technology can facilitate this process; and what emerging issues institutions, educators, and learners will face as a result of this course of action.

Today, the career and success in professional life does not depend on a degree the person received some time ago, it depends on their experience, skills, and most importantly on their attitude to change, flexibility and ability to learn. The boundaries between the more and less prestigious educational institutions, as well as more or less specialized degrees start fading as employers are increasingly relying on employees' potential to grow and develop, their critical thinking and communication skills, and on their long-term value for the organization. The better are your skills in creativity, analytical thinking and collaboration, the higher are your chances to land a good job. Specialized, degree-bound knowledge becomes a by-product of formal education and is slowly losing its value. As new jobs and new skills are reshaping what we need to learn, various learning resources are creating opportunities for continuous growth. Developments in technology have, first, made information available to anyone with the access to the World Wide Web, and now have flooded the market with every imaginable digital resource meant to help acquire this information. However, as one might argue, information is not knowledge, and access to information does not necessarily translated into effective learning. The key, and the biggest challenge for educators today, is to build on them and make sure that education develops the right skillset and fosters continuous learning.

Opportunities of the current learning

The opportunities offered by the use of technologies in education are endless. Firstly, abundance of learning resources today is overwhelming and even more of them will continue to pop up every day. While in the past knowledge was a privilege of few, today, with the ever-increasing number of online knowledge resources and many of them offering free access to content, knowledge has become a seemingly easy catch. Massive open online courses (MOOCs), video instructions, educational podcasts and live-streams are all a great source of learning opportunities. The format of content may differ, with formal and informal options, but the key is in endless opportunities available for anyone seeking knowledge. The more aware

we become of the advantages offered by such resources, the better we understand our learning styles, the higher are our chances for new skills development and, consequently, career advancement.

Secondly, lifelong learning is no longer a buzz-word in closed academic circles; it is a necessity for every adult aiming to pursue a successful career. The traditional model of education is now disrupted: while we used to acquire knowledge in a particular setting, such as classroom and during a time-bound period of time, i.e. length of a course or a degree, today this model seem no longer be effective. The fact-paced economy based on innovation and the rapid production of new knowledge sets new demands on us and we need to turn that than new knowledge into new skills. Increasingly, learning takes space everywhere, at workplace (e.g. using new accounting software), during our interactions with family and friends (e.g. management and marketing skills acquired while trying to rent out your spare room with airbnb), performing daily activities (e.g. driving an electric car). Advances in mobile and wearable technologies are facilitating this new mode of continuous learning. Moreover, the increasingly mixed digital and physical worlds create opportunities that can be effectively converted into learning. The idea of consuming knowledge "on the go", using the available resources (i.e. identifying unfamiliar vegetables while shopping in a supermarket using a special app), is becoming increasingly appealing in today's fast-changing world.

Thirdly, we all have different learning styles and the traditional educational system did indeed try to create a uniform, fit-for-all system that would arguably cater for the needs of everyone. This misbalance often leads to frustration and dissatisfaction of learners and "one size fits all" approach in traditional classroom learning may often be held accountable for low academic achievement. New technologies and a combination of data analytics help offer tailored learning paths that are based on the dynamics of individual achievement rather than on a standard curriculum (e.g. language learning software like DuoLingo). This leads to more effective and meaningful learning process and results in better learning better outcomes. One can expect a lot of developments in this area in the nearest decade which may have yet another transformational effect on traditional education. Using big data and advanced analytics to recognize individual strengths' and weaknesses and to provide each learner with meaningful feedback and motivate them to improve their results beyond grades presents a real opportunity to truly guide their individual advancement in learning.

And finally, learning to learn together is a skill that may seem underestimated but is definitely gaining momentum in the always connected world. Solving problems, however complex they might be, is no longer seen as an individual challenge but rather an effort for a team or even a network. Asking ourselves about the most valuable resource for finding an answer to any question today, we will probably agree that while twenty years ago it still used to be our parents, today it is undoubtedly the search engine. Platforms

that use networks of people to find the best solutions (e.g. Quora) are becoming increasingly indispensable for the always-connected generation. New devices make previously unforeseen interactions possible and help exploit the potential of collective intelligence. Taking it to the next level, the power of collaboration and networking in any area leads to better results than individual intelligence and stand-alone effort.

While all the above-mentioned developments present enormous opportunities for learners, the question remains as to whether the traditional academia is able to keep up the challenge and generate new added value to the learners. There are probably equal numbers of enthusiasts and sceptics among scholars but when it comes to the consumers of education: how long will they continue to buy the product that is no longer meeting their needs? Why do, despite advance knowledge of societal trends, academia generally fails to anticipate and capitalize on its potential. Meaningful changes take forever to implement, by the time some curricula revision takes place, the new developments make those revisions obsolete and as the use of technology, in many classrooms devices are still considered a disruptive force and their use is discouraged.

Challenges of the current learning

The first challenge that all educational institutions and policy-makers of all levels face is the need to develop a clear vision on the changing role of the traditional classroom in learning process. For example, Bill Gates' prediction of 2010 that "five years from now on the web for free you'll be able to find the best lectures in the world ... It will be better than any single university." came true and today every single university is competing against the top universities whose most prominent courses are indeed available to everyone. Traditional lectures are losing its appeal as most students see them as a waste of time and prefer processing this content beyond classrooms. Employers are also setting their requirements for future graduates, and those who are not happy with education provided by the universities, set up their own corporate academies making sure the content and skills they teach are tailored to their employees' needs. Universities are slowly but steadily losing their monopoly on high-quality education and only those who can capitalize on their research potential are likely to survive in the course of the century. Education is becoming a lifelong journey where you develop a skill in real life (e.g. at work) and get the certification for it in a formal educational institution. There are fewer boundaries between education and work than ever and lifelong learning becomes a necessity.

Higher education has been literally forced to innovate in the recent decade. And surely, the role of of the world's most powerful countries and influential universities in driving innovation in education has been enormous. However, tech industry analysts predict that the true disruption and transformation changes of education is likely to come from developing countries where there is a pressing need to educate growing numbers of youth and universities there are facing an existential crisis as the cost vs. return ratio of a traditional education gets worse over time. In Asia, China and India alone have a combined population

of more than 600 million children aged zero to 14 years old. These countries need to innovate in order to educate and the first online tutor Yuanfundao released in China is one of the responses to this challenge. This platform currently serves 160 million Chinese primary and secondary pupils and is known as China's first 'ed tech unicorn'. Another interesting example comes from Ukraine where a local online platform for MOOCs offers a variety of non-conventional courses that help tackle some of the country's societal problems. For instance, their first state course for public servants on public procurement Prozorro and Prozorro Advanced enjoys very high completion rate (15% and 36% respectively). This course is aimed at instructing public servants on the use of innovative online auction platform for all public procurement designed specifically to fight corruption at procurement level in Ukraine. Moreover, the platform offers a variety of MOOCs on various topics ranging from web design and data analytics to marketing, accounting, entrepreneurship, and critical thinking. The platform offers opportunities for acquiring some useful skills online and for no fee and they have recently partnered with the Ministry for Social Policy of Ukraine in a program facilitating finding employment for internally displaced people as a result of ongoing hostilities in the East of Ukraine when 1,6 million people had lost their homes and jobs. The impact of such initiatives in developing countries proves the long-lasting and transformational effect of innovation in education has on societal good and well-being.

The second challenge deals with the changing role of a teacher. While the profession of a teacher is not likely to be replaced by technology, as learning is an interactive process that requires a lot of communication and feedback, yet the skills teachers require today are no longer the same. Here, in some scholars' opinion, the generation factor plays an interesting role. While older generation of educators has deeper expertise in content and pedagogy, they are often less effective in using technology compared to the younger generations, e.g. Millennials. Interestingly, this use of technology does not directly translate into effective instructional use (Bull 2010). When it comes to effective teacher preparation, an answer to this problem may lay in collaboration across generations and building up on the strengths of each. Ministries of education and other bodies responsible for national education standards have a responsibility to develop policies and standards for effective preparation of teachers in this area and to establish best practices on effective blend of technology, pedagogy, and content knowledge.

The third challenge lies in the effective use of technologies itself. The use of technology in the classroom should be justified; by no means should the tool itself overshadow the real purpose of learning. Nowadays, technology is becoming seemingly embedded into every aspect of our life and we are increasingly imposed to learning opportunities that can be fully realized beyond classroom. A limited instruction time may be then devoted to more meaningful educational purposes. i.e. development of higher-order critical thinking and analytical thinking skills, offline collaboration and interaction, communication and feedback. This will, in turn, let the teacher avoid the pressure of competing against

technology and do what they are much better at than technology – share expertise, foster learning, encourage achievement, provide feedback, motivate and inspire learners.

And, finally, there is one more challenge looming on the horizon. The learning economy does praise the most talented and proficient learners. Those who are inherently good at learning, co-operation and communication will easily achieve success, while those who may experience problems with these skills or learning abilities will be left behind. To avoid this educational polarization and its implications for societies and economies, an equal access to the development of these skills should be guaranteed and realized by educational institutions. Open access to knowledge and/or information does not unfortunately guarantee an effective development of soft skills, they need to be de developed in social environments that encourage collaboration, communication and teamwork. This social context has phenomenal importance and schools, universities, and corporate academies are still the best places to acquire and practice those much needed skills. Open access to knowledge and/or information does not unfortunately guarantee an effective development of soft skills, they need to be de developed in social environments that encourage collaboration, communication and teamwork. The issue of equal access to education, which seemed to be effectively tackled by open educational platforms, is now taking a new turn with even more potential inequality in the learning outcomes. This issue will need to be thoroughly analyzed and dealt with, both at ministerial and institutional levels, and more scholarly research needs to be done in order to anticipate and minimize the potential threats of new developments in education.

Conclussion

In conclusion, one thing is clear - we are now living in the time of transformational changes in various areas and education is undoubtedly one of the most important of them. This area has never been challenged more than in the recent decade and it is now disrupted by industry, technology, and corporate sector. Undoubtedly, many institutional and individual efforts are being made now to make education more open, accessible, and learner-focused than ever. New developments and advances in digital technologies are contributing to making learning a truly collaborative and engaging experience and we are now just at the very beginning of this exciting journey of exploring and creating new knowledge. This journey is not going to be easy, though, and this challenge is for all of us, educators, scholars, innovators, and makers, to lead this educational transformation and make good use of these efforts and ensure high-quality and affordable education for all.

References

Bates A., 2000. “Managing Technological Change: Strategies for College and University Leaders”. The Jossey-Bass Higher and Adult Education Series.

Bull G., 2010 “The always connected generation”. Learning and Leading with Technology, pp. 10-11.

Christensen, J.L. and Lundvall, B.A. eds., 2004. Product Inovation, Interactive Learning and Economic Performance. Emerald Group Publishing Limited.

Daniel J., 1996. Mega-universities and knowledge media: Technology strategies for higher education". Psychology Press.

Lundvall, B.Ä. and Johnson, B., 1994. "The learning economy". Journal of industry studies, 1(2), pp. 23-42.

Nickerson R., Zodhiates P., 2013. eds. "Technology in education: Looking forward 2020". Routledge.

Salomon, G., 2016. "It's not just the tool, but the educational rationale that counts"? Educational Technology and Polycontextual Bridging, pp. 149-161.

Methodologies

METHODICAL SUPPORT FOR TEACHERS OF ROBOTICS IN THE CZECH EDUCATIONAL SYSTEM

JAN BAŤKO

Faculty of Education
University of West Bohemia in Pilsen, Czech Republic

e-mail of corresponding author: hanzi23@kvd.zcu.cz

Key words: robotic kit, primary education, programming, primary school, methodical support.

Abstract: The aim of this work is to describe the possibilities and extent of the methodical support of teachers of robotics and robotic programming in the Czech primary education system and to find and describe the deficiencies as well as possible ways to improve the educational support of teachers in this field.

To map the current situation in the robotics education in the Czech Republic, we implemented a questionnaire survey by means of a structural online questionnaire which took place in November and December 2016 and was aimed to teachers of primary schools and appropriate school years of multi-year grammar schools. 3911 schools were asked to fill in the questionnaire. We received 360 responses. Afterwards we mapped the available methodical materials primarily focused on robotic kits LEGO in Czech and foreign market with the aim to describe the possibilities of teacher support in the robotics education.

The result of the survey of available materials in the market was the finding that there are a lot of Czech and foreign materials which use various approaches in the education. It is evident that teachers do not use foreign materials very much and that they rely mainly on the materials being included in the kit or on freely accessible materials provided on specialized webpages and blogs. As for the foreign materials, teachers miss mostly the translation into Czech language and its usage in the Czech education system.

The results of this study could help to map the extent of methodical support of teachers in the specific field of robotics education as well as teachers´ requirements and needs which could help with the future improvement. Strategy of Digital Education until Year 2020 should also contribute. In the strategy, there is also included the methodical support of teachers to integrate new technologies in education.

Introduction

The sharp increase in the number of new technical and teaching resources leads to the transformation of Czech education environment. New digital tools are being delivered into technically-oriented subjects to all types of schools, which makes it necessary to revise the content and methods used in teaching and to search for new and up-to-date methodological approaches. One of the areas that is currently undergoing this process in the elementary and high school curriculums is robotics. The word robot is defined in various ways. Robot (McKerrow 1986) is most commonly referred to as a machine that can be programmed to perform various activities and tasks. Robotics as a discipline then comprises its design, creation, management, programming and its use in solving various problems (McKerrow 1986). All of these activities can be applied and used also in education, which leads to the concept of educational robotics (Tocháček, Lapeš 2012), which uses robots to accomplish educational goals. It is characterized by the utilization of robots when acquiring knowledge and skills in the field of technical subjects. Students discover technical and mechanical principles by solving and completing robotic projects and activities.

However, the concept of educational robotics cannot be generalized. In lessons, we can use a number of robots whose primary function is to only respond to specific student's commands, either in the form of input data or a created program. In this article, we will focus on robotic kits, which are specific, because the robot has to be assembled either by the students themselves or it has to be prepared by the teacher before beginning the actual task. Therefore, working with these robots also involves designing them and

the actual construction. The kit then becomes a means of understanding the various design mechanisms and elements. The finished model can then be revived by a programmable control unit and with a range of input and output modules and sensors.

Since robotics and robot programming are not currently included in the curriculum for elementary and high schools, only enthusiasts who want to enrich their lessons beyond their obligatory and recommended content include robotics into teaching. Because of the lack of information on how to teach robotics and how to use the robotic kit in lessons, the teachers mostly gather information from available sources. However, methodical support for teachers is planned for the future as well as the use of new digital technologies in schools. This concept will be included in the Digital Education Strategy 2020, which plans to ensure open, non-discriminatory access to information and also a sufficient degree of methodical support for teachers. The planned changes include updating the curriculum focusing on technical education (MŠMT 2014). Then the question is, whether robotics will become part of the curriculum as its popularity grows. The Centre of Robotics in Pilsen, which is widely supported by the city aims to educate a new generation of students interested in technical education. This can be a sign of this growing trend.

Up to this time, changes have not yet been made, so teachers need to look for other ways to get quality information and materials focused on teaching robotics. There are a lot of methodical materials to be bought. They could be divided into several groups. To the first group belong products which are published directly by the producer of robotic kit. The manual which is provided together with kit can be also included here. The materials are either general or thematically oriented. To the next group belong materials published by other educational institutions or specialists. The last group contains various tips and exercises which are available on specialized educational websites and blogs.

If we look for example at the offer of methodical materials of one the biggest robotic kit producer, company LEGO, we will find a variety of materials. LEGO's methodical products are available at http://www.lego.com's official website. Exclusive distributor of this company's products to the Czech Republic is Eduxe ltd. The LEGO products overview can also be found at the company's E-shop.

2005544 EV3 projects

The first introduced material is the projects primarily for the LEGO Mindstorms EV3. The material is divided into three areas: movement, intelligence and system. The students are guided primarily from the design of the robot to the actual creation. The aim of the material is to develop and improve students' creative thinking and constructive skills. It also helps to improve cooperation and effective communication among children and therefore helping them to solve the problem. The stated material span is 30 hours. The last part is intended for the teacher. This is a set of PDF documents containing recommended ways how to use methodical material, along with tips on solving tasks which are contained in a relatively large amount.

The product is mostly focused on the use of the robotic kit and its modules. This does not prevent it from being used in any technically oriented subjects.

2005574 EV3 Space Challenge

Compared to the previous material, this one is closely related to the imaginary environment of the Universe. The unpleasant thing in using this kit may be the fact that for the full utilization of this product the users need to buy an extension kit called Space Challenge. Without it, only part of the tasks can be solved. The material is again in English and it includes tasks related to robot movement, calculations and research projects. Its wider use in various technical subjects is very well possible. At the end, the material again contains tips and tricks for teachers that make it easy to use the product to its full potential in the classroom.

There are many foreign language materials available on the market. Their authors are either education experts, educational organizations, universities, but also enthusiasts from the public. These materials are either provided printed or published on websites for free or for certain charge.

Classroom Activities for the Busy Teacher: EV3

The product is designed for 10 weeks of robotics teaching. Its author is Dr. Damien Kee, an independent expert in technologies who focuses on robotics. The material is based on the LEGO Mindstorms EV3 and is available in English only, both in printed and in electronic form. It contains a total of 24 chapters, each of them is conceived as an individual task or a project with an extensive description, process demonstration with many pictures included and also adding the demonstration of the construction design of the robot. Both the teacher and the student are thus closely involved in solving the task. The material is not narrowly specified and can therefore be widely used in various areas.

Robotics 1 with LEGO® EV3 a Robotics 2: EV3E **More**

The publisher of both materials is the Ohio State University. The publications focus on teaching robotics and understanding its basic principle and meaning. Given tasks are solved by using the LEGO Mindstorms EV3. The publications are a collection of worksheets into which students fill out answers to various questions or they describe the process of solving the tasks. On the University's website the supporting videos can be found. The material is completely in English, as well as the videos, and although it is from two publications, it is not as extensive as the previous materials presented.

Plenty of users who work with robotic kits in the Czech Republic and abroad publish their work and projects the most frequently on websites. Only some users create compact methodical materials of higher range.

TFs LEGO Mindstorms

One such material dating back to 2014 and thus still focusing on the older version of LEGO Mindstorms NXT is by Tomáš Feltl and is available at http://www.tfsoft.cz. This is a set of materials

containing work cards, ideas, methodological notes, building guides, and test pads. The biggest advantage of the material is that the user can try out the material for free and if he decides to start using it, he then pays the fee to the author. This fee is very low compared to LEGO's commercial products. The advantage of the Czech material is that it is completely in Czech language and that it contains a lot of robotic tasks and tips for usage.

The aim of our research was to cover and describe the possibilities and the degree of methodical support of a robotics teacher and robotics in the Czech primary education and to find and describe the shortcomings and possible ways to improve the support for the teachers. In order to fulfill this goal, we have set several sub-goals:

1) To map and describe the level of using various types of methodical materials by teachers in the Czech Republic.
2) To find out and describe what experience teachers have with foreign paid methodical materials.
3) To map and describe what properties should and ideal methodical material have and what should it contain according to teachers.

For each sub-goal, we set research questions and then searched for answers:
Ad. 1: What methodical materials for the support of robotic education are used by teachers in the Czech Republic the most frequently and to what extent?
Ad. 2: Are according to teachers foreign paid methodical materials suitable for the education in czech circumstances? What properties characterize the materials which they have worked with?
Ad. 3: What properties of methodical materials are the most important for teachers? What type of information would they appreciate the most in methodical materials?

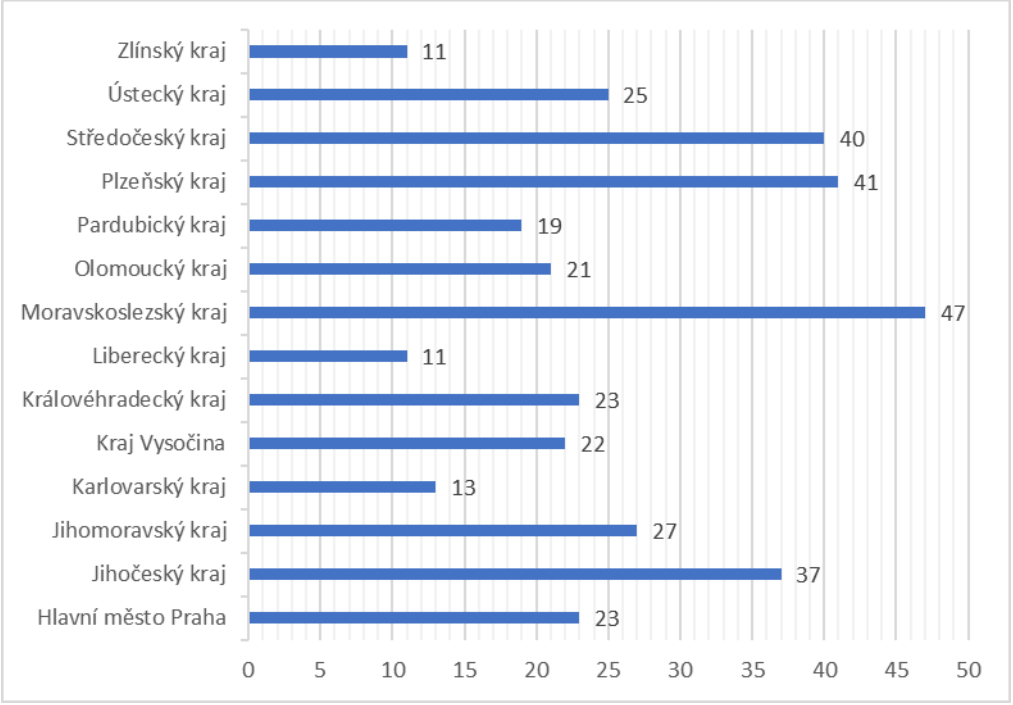
Research methodology

We carried out a questionnaire aimed at analyzing the current situation in teaching robotics in the Czech Republic. During the research, we contacted 3911 elementary schools and high schools throughout the Czech Republic. The target group of the research was teachers of the upper primary school and the corresponding years of high school. We focused mainly on teachers who actively use robotic kits in their lessons. Among the teachers, we focused on subjects where robotics is used, how to use the robotic kits, how to build and how to program the robots, methodical materials, exercises used in lessons, and the actual schedule of teaching robotics. We also focused on teachers who are not currently using the kits to find out what is the reason for not doing so, and we also asked about the shortcomings which are connected with the usage of robotic kits in lessons.

We received a total of 360 answers from all over the Czech Republic (see Chart 1). 311 of the respondents are not currently using the kit in their lessons from various reasons. The remaining 49

respondents use robotics in diverse subjects. Thus, the percentage of the questionnaire return was 9,2 %. The age variety of all respondents (140 men and 171 women) is shown in Table 1. In this paper, we will present only a part of the obtained results from the questionnaire. The data cover the questions that were focused on methodological support for teaching robotics.

CHART 1. DISTRIBUTION OF RESPONDENTS IN INDIVIDUAL REGIONS OF THE CZECH REPUBLIC



Source: Own

TABLE 1. AGE STRUCTURE OF THE QUESTIONNAIRE RESPONDENTS

Age	**Number of the respondents**
Up to 26 years	8
From 27 to 40 years	107
From 40 to 50 years	122
Older than 50 years	123
Total	*360*

Results of the questionnaire

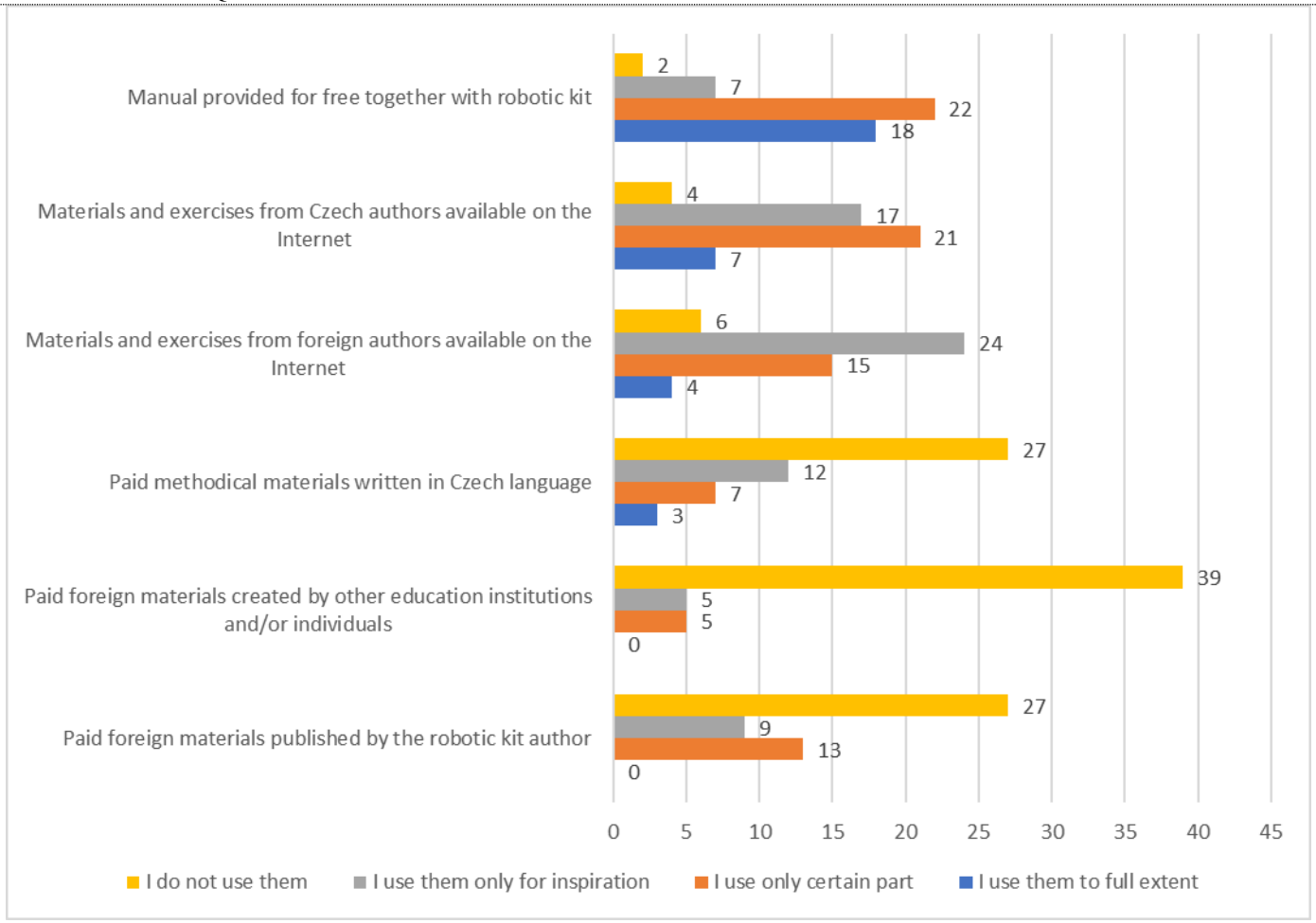
An inexperienced user who buys a LEGO robotic kit does not get any basic set of methodical material that would make it easier to use the product in lessons or at least make it easier for him to integrate the kit into his classes. The kit only includes a manual that is also available for download from the official LEGO websites in PDF format. It contains only the basic instructions on how to use the construction kit and the programming environment. At the end of the manual, in the troubleshooting section, an overview of the

available multimedia elements (images and sounds) contained in the memory of the control unit can be found. There is no other information about programming the unit nor about teaching. First, we were interested in what kind of methodical materials respondents use and to what extent. We divided the materials for the purposes of the questionnaire into the following six groups:

- manual supplied free of charge with a robotic kit (also available for download in PDF format on the manufacturer's official website),
- ideas and examples from Czech creators available on the Internet,
- ideas and examples from foreign creators available on the Internet,
- paid, Czech-written methodical materials,
- paid, foreign-language materials created by other educational institutions,
- paid, foreign-language materials from the manufacturer.

The results shown in Graph 2 show that respondents mostly use the free manual from the manufacturer which is a part of the purchased kit. The second largest source of ideas for the respondents is the examples and ideas that the members of the Czech community of robotic kit builders publish on their websites and blogs. On the other side, the ideas from the foreign creators on foreign language websites serve to the respondents rather for inspiration to create their own tasks and projects. The least used type of material are the foreign-language paid materials based on the responses from the questionnaire. It could be further investigated whether the price of the materials or the language barrier is the main factor affecting this behavior.

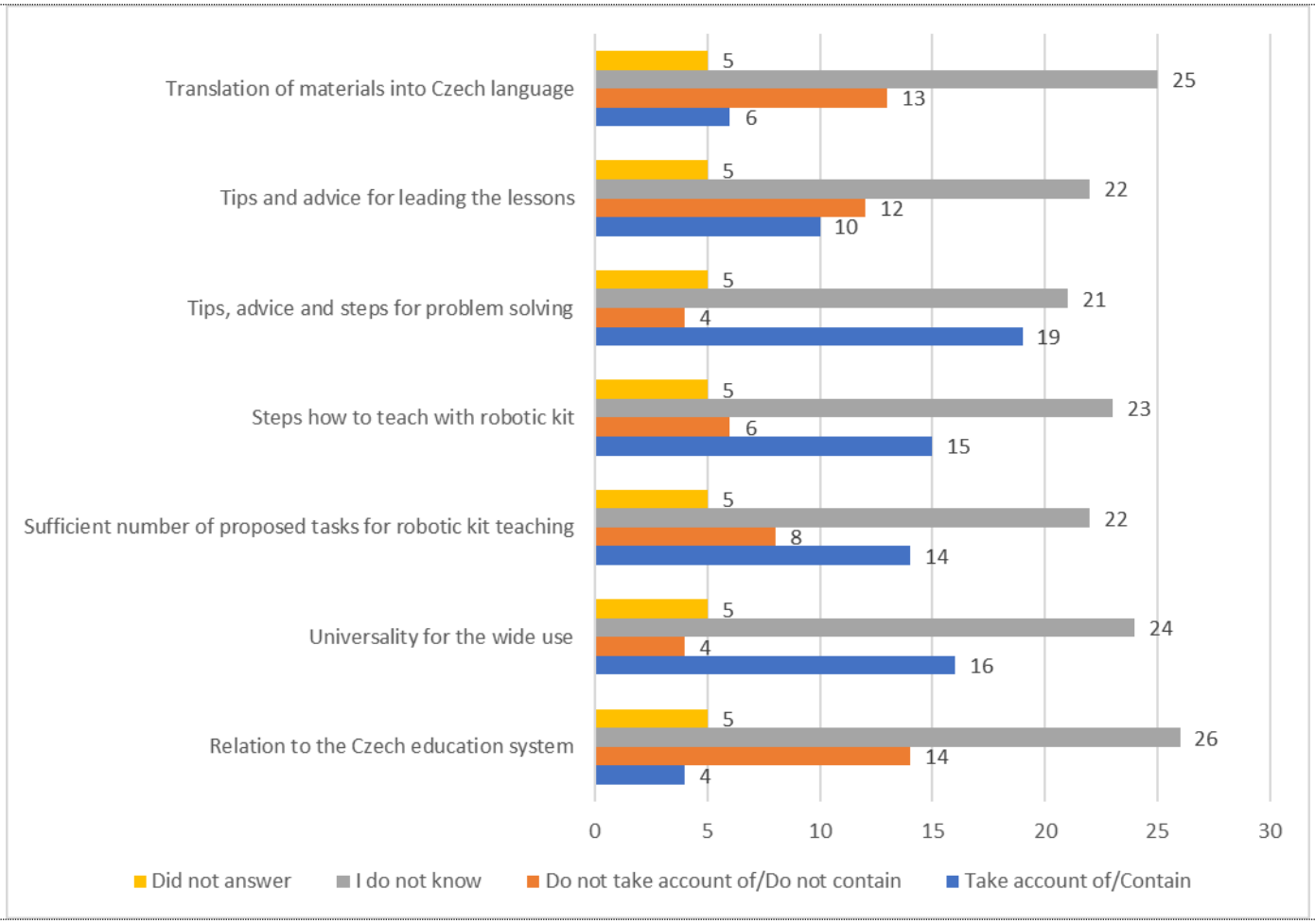
CHART 2. MEASURE OF THE USE OF VARIOUS TYPES OF METHODICAL MATERIALS FOR THE ROBOTICS EDUCATION SUPPORT ACCORDING TO THE QUESTIONNAIRE RESPONDENTS



Source: Own

As for the foreign paid materials, we also asked the respondents who own them about their experience with these materials. They were provided with selected features that could be crucial for the respondents when selecting the materials that would they use and asked them to evaluate whether or not these features are included in their owned materials. This question was not obligatory as we assumed that not everyone would own these types of materials so they would not be able to answer the question. The results are shown in Graph 3. From 49 responses, the question was not answered 5 times. Most respondents said that foreign paid materials contain tips, hints and procedures on how to solve problems that can be encountered with when working with a robotic kit, they are also universal and therefore can be used for in various lessons, they include robotics teaching guides and a sufficient number of tasks. On the contrary, most of the respondents answered that the biggest issue among these materials is the lack of Czech translation and that these materials are not connected and linked with the Czech education system.

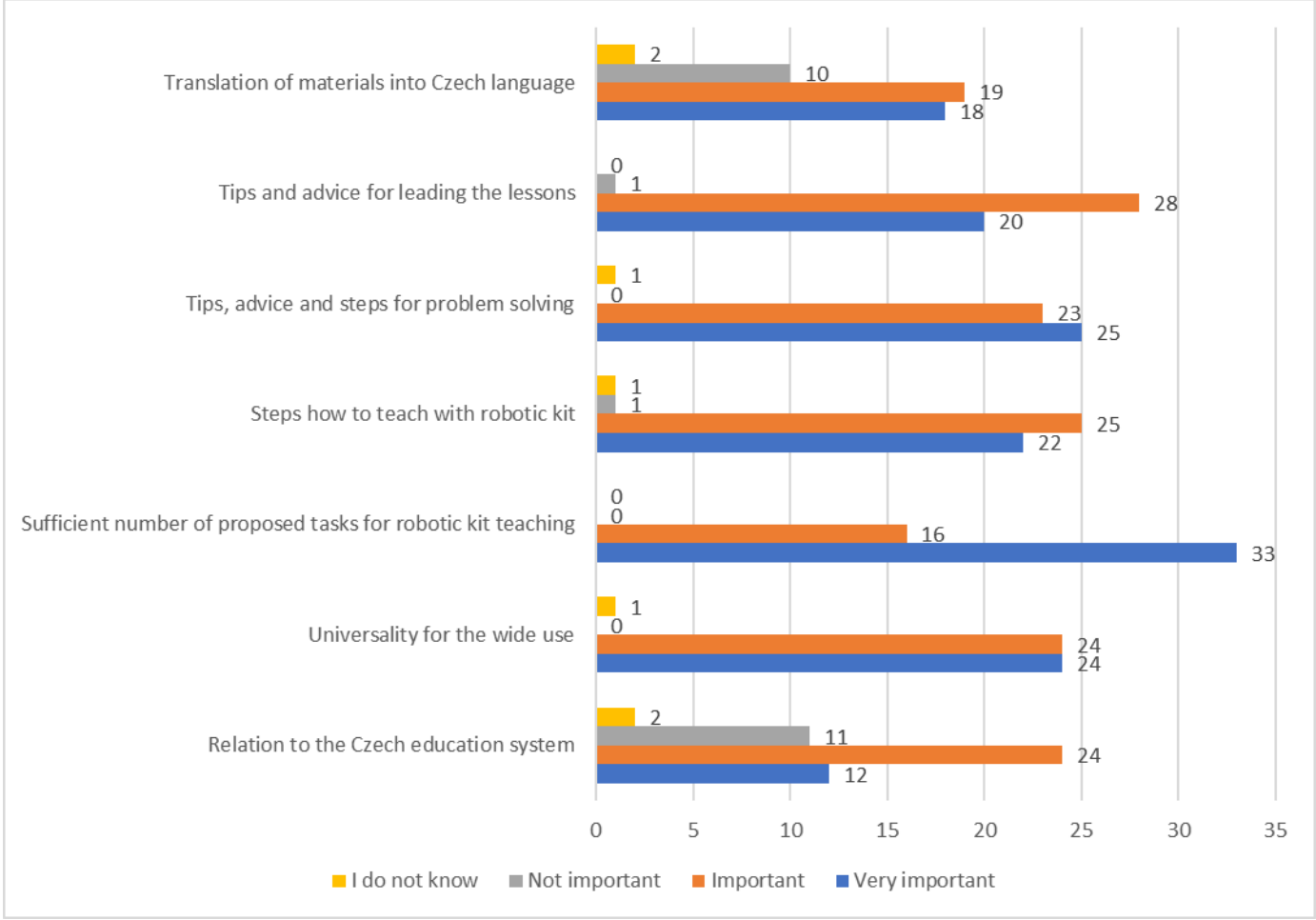
CHART 3. RESPONDENTS´ EXPERIENCE WITH FOREIGN PAID MATERIALS – LIST OF PROPERTIES, WHICH MATERIALS TAKE ACCOUNT OF/CONTAIN ACCORDING TO THE RESPONDENTS



Source: Own

In response to these findings, we asked the respondents what features and criteria would the methodical material have to meet in order to be used in lessons. The results are presented in Graph 4. The most important feature in the methodical material for our respondents is the presence of a sufficient number of tasks and exercises suitable for class. The material should also contain tips, tricks, and procedures on how to solve problems that can be encountered with when working with the kit, it should also be universal for widespread use in lessons, and it would also include the process of teaching. On the other hand, most of the respondents stated that it is not important for them to have a material that is not connected to the Czech educational system and for 10 respondents out of 49 the translation into the Czech language is not important.

CHART 4. THE IMPORTANCE OF METHODICAL MATERIAL PROPERTIES FOR THE USE IN CZECH EDUCATION ACCORDING TO THE RESPONDENTS WHO USE THE ROBOTIC KIT IN THEIR LESSONS



Source: Own

Final summary

In the final section we will try to summarize the research findings. Robotic kits are a new teaching aid which is to be integrated into teaching due to its potential for teaching algorithm or programming. For a number of teachers, however, robotic kits are still relatively unknown and therefore they will probably try to find adequate methodical support when using them. In our research, we found out that when purchasing a basic kit, the teacher does not get the material that describes how to grasp the lessons and how to proceed with the kit. The teacher must obtain this information from other available sources.

In the Czech Republic, teachers are looking for examples of tasks and projects that they use in lessons mainly on the Internet. They either use these directly or modify them to and make their own. On the contrary, the least used materials are the paid ones which are widely spread over the market. It may be the subject of further investigation to identify the cause of this condition. It may be the high cost of the materials that the schools are unwilling to pay, or the language barrier that will not allow the teachers to use the costly material to their full potential. If teachers were to select a suitable methodical material, the

most important feature when deciding what to use is the sufficient number of tasks and exercises to be used in lessons. In addition, the presence of a troubleshooting section to solve problems that can be encountered with when working with the kit, tips for leading lessons, and the use of the material in different areas and subjects.

We introduced several methodical materials available on the market, which we divided into three groups and from each of them we selected one or more examples that we briefly described. From the description follows that the most of them fulfil the respondents´ requirements on the material content. The description shows that most of these materials meet the material content requirements that was set by the respondents. Further research could focus on whether teachers have ever encountered with these materials and whether they are using them and to what extent. This would give us further information about the teacher's needs in the area of methodical support for robotics.

Throughout our research, we have tried to point out the needs that teachers have in the area of methodical support for robotics, pointing out the potential areas of support in the planned activities that are part of the Digital Education Strategy in 2020. At the same time, we also point out to some exemplary commercial products that are being created for this purpose abroad, and which can be an inspiration for Czech creators, because relatively few Czech-language materials are available at the moment. If the new digital teaching aids are to be included in the newly developed curriculum, initial support for teachers should be given a priority in their deployment.

References

McKerrow, P. J., 1986. "Robotics, an academic discipline?", Robotics, Vol. 2, No. 3, pp. 267-274.

Tocháček, D., Lapeš, J., 2012. "Edukační robotika", Vol. 1. Univerzita Karlova, Pedagogická fakulta, Praha. ISBN 978-80-7290-577-5.

MŠMT., 2014. Strategie digitálního vzdělávání do roku 2020, "Ministerstvo školství, mládeže a tělovýchovy", http://www.msmt.cz/file/34429/, accessed on 12th May 2017.

EFFECTS OF ICTS' TRAINING FOR TEACHERS IN PRIMARY SCHOOL ON STUDENTS' COMPETENCIES, MOTIVATION AND PERCEIVED CLASSROOM CLIMATE

FRANCESCO PISANU
Fondazione Franco Demarchi, Italy
LISA FREISE
Osnabrück University, Germany

e-mail of corresponding author: francesco.pisanu@fdemarchi.it

Key words: In-service teachers' training on ICTs', Students' competencies, Students' motivation, Students' perceived classroom climate, Quasi-experimental design.

Abstract: The evaluation of in-service training for teachers is becoming a 'must do' worldwide. This issue is of particular importance in the field of in-service teachers training on ICTs'. Research has shown that one way to introduce ICTs successfully' in schools is through different kind of training programs and professional development for teachers. It is not just a matter of buying technologies, but also letting teachers be ready to master technology use in daily activities with their students. After years of massive ICTs' based training, to date, there is not a clear clue about the effects of this process. Technology has been introduced in schools, teachers have been trained, but there is no evidence about the effects of this training. From the other hand, there are various methods and approaches for the evaluation of training programs for teachers in-service training on ICTs'. In the study presented, it is postulated that teacher education programs on ICTs' could be evaluated using student-related variables such as students' competencies, and students motivation, since teachers play an essential role in student development. A study measuring primary school student motivation, classroom climate in the subcategories of competitive, individualistic, and cooperative learning, and students' competencies in reading and comprehension and mathematics, in control and experimental classes, was conducted in 8 classes in primary schools (students sample N=134; 64 from the experimental group: 4 classes). Teachers in experimental classes received training on topics such as the effective use of information and communications technology (PC, Interactive Whiteboards, Videogames, ...) to be applied directly to their students, over a period of three years (from grade 3 to grade 5), while teachers in the control group did not. Logistic regression was performed to investigate which student-related variables significantly predicted affiliation with control or experimental group. Results of the study show proximal training transfer has taken place in the form of increased use of ICTs' in the experimental classes, but no evidence of more distal effects was found, which means that even using more participative training on ICTs' for teachers does not lead to an improvement of students' competencies, motivation and classroom climate. More specifically, the frequency of interactive whiteboard use significantly predicted group affiliation. Even though in this study no conclusive evidence for more indirect effects of teacher training on variables such as student achievement could be found, it is argued how the given approach to teacher training on ICTs' evaluation could be beneficial.

Introduction

The aim of the current study is to find alternative ways to evaluate and measure the success of a teacher training programme on ICTs' by assessing student competences, motivation, and classroom climate. It has been postulated that an effective training of teachers would lead to improvements in the previously mentioned properties compared to a control group whose teachers have not been trained. Hence, it should be possible to evaluate teacher training using its direct and indirect consequences instead of relying on satisfaction and feedback of training participants. In the current study, a teacher training programme's effectiveness and outcomes were to be indirectly evaluated using student-related variables. The frequency of IWB use, the classroom climate in the dimensions of competitive, individualistic and cooperative climate, the students' INVALSI test scores in the subjects Mathematics and Italian before and after teacher training, and the students' motivation were expected to be of use in evaluating the teacher training success. Due to the content of the teacher training programme, which included training in efficient use of ICTs, the experimental group was expected to more frequently use ICTs in class compared to the control population. Furthermore, the classroom climate, students' motivation, and INVALSI scores were postulated to be better in the experimental population in contrast to the control group. The article is organized in this way. A first part is a literature review on the use of ICT in teaching and training process related to this. To begin

with, an outline of training processes will be introduced before considering potential options to evaluate teacher training. After that the empirical part with two logisti regression models and a final conclusion part with possible future development of the research in this field.

Literature review on the use of ICT in teaching and related teachers' training process, and the evaluation on teachers' training

The use of information and communications technology (ICT) in schools has gained importance during the past few decades. Evidence of its positive effects on students' learning has been found, but despite training programmes and investments by schools in ICT resources, the usage of ICTs in schools has changed quite slowly (Mumtaz 2000). Teachers' usage of ICTs depends on the institution, on available resources and on the teacher.

On the one hand, educational ICT policies have been introduced to facilitate the use of ICTs in schools, which can be based on numerous rationales, for instance the following four: (1) economic, to gain a skilled work force, (2) social, to support students in becoming responsible and well-informed citizens, (3) educational, to facilitate teaching and learning, or (4) catalytic, to accelerate educational innovations (Tondeur, van Braak and Valcke 2007). However, an increasing convergence between the economic, social, and educational rationale has been reported.

On the other hand, the way teachers truly use ICTs in the classroom is another matter. Teachers in Belgium, for example, use ICTs in primary schools but still emphasise mainly the technical skills related to ICTs instead of using them to support the subject related learning process (Tondeur, van Braak and Valcke 2007). Hence, ICT policies and the de-facto application of ICTs in the classroom might still be quite far from one another. As long as this is the case, student learning does not benefit from ICTs as much as it could since the ICT use does not reach its full potential.

An example of possible strategies to integrate ICTs into the classroom is the following method to incorporate the use of interactive whiteboards (IWB) in primary school classrooms. In addition to the acquisition of the IWBs, investments into both technical competence and classroom pedagogy are needed to prepare teachers to effectively use an IWB in lessons. For this purpose, sufficient funds need to be available (Beauchamp 2004). Prior to using IWBs, some skills, such as navigating the operating system and file management, can be practised using computers instead. Once IWBs have been widely introduced in the school, teachers require ongoing support and training in using the accessible programmes. After initial information about a programme and its use in the classroom, further support for each programme should be given, and no new programmes should be introduced until the teachers feel confident in using the previous one. Hence, it will take the individual teachers differing amounts of time to go on to a new programme or skill, meaning that whole-staff training may be useful in the initial phase of learning to use the IWB, but not later on when teachers become more advanced users of IWBs (Beauchamp 2004). Thus, flexible access to training may need to be provided to the more advanced teachers to give support when or

if they require it. The final aim is a synergy between teachers, their students, and technology (Beauchamp 2004).

The learning solutions approach (LSA), as described by Gentile and Pisanu (2013), refers to designing learning activities that are intentionally focused on cognitive goals matching the national curriculum. During the LSA activities, students need to recall knowledge, interact with a software, solve pen-and-paper tasks, cooperate with other students, and reflect on how and what they are learning (Gentile and Pisanu 2013). Hence, in LSA activities, technology is just one of the media used in the learning process.

The individual LSA activities have a duration from 2.5 to 4 hours and consist of five components: contents, technologies, cooperative tasks, formative assessment, and feedback from teachers and peers. As mentioned before, the contents are aligned with the national curriculum in terms of the learning goals. Moreover, the technologies consist of various devices and software whose integration into lessons supports teaching and learning, for instance reading comprehension and mathematics. The interaction between students in small groups or pairs is a key feature of the cooperative tasks in LSA activities. The formative assessment at the end of LSA activities measures students' understanding and skills and informs the preparation of feedback. Finally, the feedback closes the LSA activity by offering reflection on the given activities based on what was or was not successful and effective and how it could be improved the next time (Gentile and Pisanu 2013). Overall, the LSA represents one way in which technology such as IWBs or computers may be integrated into lessons to enhance learning of a given subject matter and not only to gain the technical skills necessary for using the devices.

Evaluation as part of an effective training system allows organisations to adapt training as necessary if a certain training is not effective or otherwise keep it unchanged (Salas, Tannenbaum, Kraiger and Smith-Jentsch 2012). As mentioned above, the training effectiveness can be assessed on several levels. Hence, individual-, group-, or organisational-level factors that influence learning (during training) and transfer (after training) are studied (Aguinis and Kraiger 2009). Widely used in training evaluation is the Kirkpatrick four-levels approach that includes reactions, learning, behaviour, and results. The reactions, as defined in Kirkpatrick's levels, measure how well trainees liked a training programme, while the learning-level records which principles, facts or skills have been learned (Salas, Tannenbaum, Kraiger and Smith-Jentsch 2012). Furthermore, the behaviour-level regards the changes in trainees' behaviour in the work environment following training, and the results-level measures the outcomes of training such as fewer errors or enhanced profits. However, Kirkpatrick's approach has been repeatedly criticised in research literature (Aguinis and Kraiger 2009).

Additionally, it has been proposed that organisations need to specify the purpose of the training evaluation before beginning it (Aguinis and Kraiger 2009; Salas, Tannenbaum, Kraiger and Smith-Jentsch 2012) to allow for making informed decisions about what and how to measure. For instance, imagine an

organisation conducted training to ensure their trainees are able to recall at least a certain number of product details. If the training assessment now only looks at the change in the ability to recall product details, they do not know whether the trainees are able to recall the set threshold amount proposed by the organisation at the beginning of training. Trainees might have improved but may still not reach the threshold set by the organisation, thus, the training would have been successful in the sense that trainees improved, but unsuccessful in terms of achieving the set goal. Hence, there are two separate question of interest: one concerning how much change occurred, the other regarding the achievement of a target performance (Sackett and Mullen 1993).

Evaluation of training programmes in organisations is not likely to be conducted in truly experimental designs, thus, controlling as many extraneous variables as possible while bearing in mind the limitations of the designs used, is important to, nevertheless, achieve appropriate evaluation (Goldstein and Ford 2001). Depending on the available resources, various designs can be applied to assess training effectiveness. Combinations of pre-testing, post-testing and control group designs are possible to address threats to validity, which will be discussed later on, and can be chosen taking into account the circumstances in the individual organisational context. Pre-experimental designs include the one-group post-test-only design and the one-group pre-test/post-test design and do not have control procedures, which hinders the cause-and-effect relationship specification (Goldstein and Ford 2001). The second group of designs are experimental designs, such as pre-test/post-test control-group designs and the Solomon four-group design, which have varying degrees of control over some threats to validity. Finally, quasi-experimental designs, for example the time-series design and the non-equivalent control-group design, are useful in various social science settings where full control over the environment is impossible.

After considering the currently available designs to evaluate training programmes according to their internal and external validity and their results on several levels such as reactions, learning, behaviour, and results, novel indirect evaluation opportunities will be discussed in the subsequent sections using the example of a teacher training programme. Additional methods to evaluate training programmes are useful to improve the repertoire of evaluation methodology available to suit the resources and capacities of individual organisations, and further investigation of the impact of teacher training on not only teachers but also their students is worthwhile for understanding and improving student development. Furthermore, only certain approaches are viable in real-life work environments such as schools. Hence, student-related variables such as the student motivation, classroom climate, the in-class-use of information and communications technology (ICT), and student achievements are discussed and appraised concerning their usefulness in evaluating the effectiveness of a teacher training programme indirectly by using its impact on students.

Motivation is widely thought to be influenced by both intrinsic factors, such as pleasure in an activity, and extrinsic factors, such as rewards for completing a task (Gagné and Deci 2005; Ryan and Deci 2000). However, the relationship between intrinsic and extrinsic motivation needs to be established – in order to facilitate the understanding of a person's motivation – to enhance the capacity of relating the influence of the motivational factors on student achievements.

Since it is commonly used in the field of education, the self-determination theory (Gagné and Deci 2005), short SDT, will be the basis of the study at hand. It takes into account intrinsic as well as extrinsic motivation and its subparts. The differentiation between autonomous motivation and controlled motivation is essential in said theory since both are thought to vary in their underlying regulatory processes and accompanying experiences. Furthermore, according to the SDT, an autonomy continuum exists, which goes from acting with a sense of volition and choice to performing actions experiencing a sense of pressure. By all accounts, behaviours can be characterised by their placement on a scale from autonomous to controlled motivation (Gagné and Deci 2005). The absence of intention to act is referred to as amotivation, from extrinsic and intrinsic motivation.

Previously, a study by Lepper, Corpus, and Iyengar (2005) on Californian public school students in the grades three to eight found that students' external and internal motivation experience a shift during elementary school. A significant decrease of internal motivation over time was found while external motivation differed little across time. Notably, the extrinsic and intrinsic motivation were measured independently from one another by eliminating the assumption that the two are necessarily opposites (Lepper, Corpus and Iyengar 2005). Conceivably, motivation may be useful to indirectly evaluate the effectiveness of teacher training programmes since it is a variable, which is influenced by teacher behaviour (Skinner and Belmont 1993) while at the same time affecting student achievement (Ryan and Deci 1991).

Cooperative learning, which involves groups of students working together toward a goal, has been found to impact classroom climate (Zahn, Kagan and Widaman 1986). Furthermore, since there exist questionnaires that measure climate according to the competitive, cooperative, and individualistic climates in a classroom based on cooperative learning (Miato 2004), it was selected for assessing classroom climate for the purpose of this study. Moreover, another important factor for relying on cooperative learning was its wide use in educational contexts (Johnson and Johnson 2009).

Cooperation effectiveness may be mediated by five variables: positive interdependence, individual accountability, promotive interaction, appropriate use of social skills, and group processing. While the first was already mentioned, the second variable, individual accountability, refers to assessment of individual results by the group and individual in comparison to a standard performance, and the third, promotive interaction, describes individuals supporting each other to achieve a common goal (Johnson and Johnson

2009). Fourth, the appropriate use of social skills facilitates effective cooperation, since it, for example, enhances communication. Finally, group processing takes place, for instance, when group members decide on an action or reflect on actions of their members.

Nevertheless, as mentioned previously, cooperative learning based classroom climate may be assessed on three levels: competitive, individualistic, and cooperative (Johnson and Johnson 2009). Additionally, there exists a relation between classroom climate and teacher behaviour in the sense that a number of teacher related properties might influence classroom climate. For instance, a teacher's habit of self-disclosure on Facebook can affect classroom climate positively as well as negatively depending on the nature of the self-disclosure (Mazer, Murphy and Simonds 2007). Another example of how teacher behaviour can influence students' perception of classroom climate is that students perceive classroom climate in relation to teachers' use of humour (Stuart and Rosenfeld 1994). Hence, depending on the type of humour and its quantity the classroom climate perceived by the students can change.

In recent years, student achievements have been measured using, for instance, nationwide tests, such as the INVALSI state testing in Italy, or international tests, such as the OECD's Programme for International Student Assessment, short PISA (OECD 2016). Skills and abilities needed for subjects such as mathematics or languages are tested to achieve results that are comparable either nationwide or even internationally. In case of the INVALSI state testing, students from Italy are tested to establish their performance in various grades and subject domains (Invalsi 2011, 2016; Invalsi 2013, 2016). The INVALSI state testing is completed, for example, in the second and fifth grade of primary school (Invalsi 2011, 2016; Invalsi 2013, 2016). According to the performance of the participating students in certain tasks of the mathematics or Italian tests, problems with specific tasks, and the cognitive abilities on which they are based, can be identified specifically for individual classes or schools and, thus, can be improved during the following school year. Hence, the test results offer a valuable diagnostic tool to plan and adjust lessons to achieve the full potential of students.

Previously, it has been argued that teachers' effectiveness and performance can be measured by assessing student achievement. Large statistically significant differences exist between individual teachers (Rockoff 2004). An increase of one standard deviation in teacher quality can lead to mathematics and reading test results being raised by approximately .24 and .20 standard deviations, respectively, using nationally standardised tests. Hence, enhancing teacher quality will in turn enhance student achievement, which is generally desired. The evaluation of standardised test results is the task of schools and especially teachers (Boscolo 2016). However, importantly, the performance of students is necessarily an indicator of the teachers' capacity and the school governance. If INVALSI test results can be used to assess teacher effectiveness, it should be possible to use it to follow the training progress of teachers by tracing student performance in relation to teacher training and its transfer (Fraccaroli and Pisanu 2016). Nevertheless, it is

important to keep in mind the limitations of this approach since many variables influence student achievement apart from teacher performance and the training transfer is already an important mediator between skills learned in training and the effect the teacher training has on students.

Methods

To allow for indirect evaluation of the effectiveness of a teacher training programme using student-related variables, teachers as well as their students were part of the given study. Furthermore, teachers and their classes were assigned to experimental and control groups, participation was voluntary, and no remuneration was provided. The study's student population consisted of four experimental and four control classes. The experimental and control classes were roughly matched according to the students' number, age and gender. Due to missing data and changes in the student population during the three-year study period, finally, 134 students were included in the data analysis. The experimental student population, n=64, consisted of 28 females and 36 males while the control student population, n=70, contained 35 females and males respectively. The Mathematics and Italian teachers from the four experimental classes received training over a period of three years starting from the school year 2010/2011. The experimental group teachers, n=11, voluntarily participated in the training programme. Three of the eleven teachers taught mathematics, four Italian, two were assistants who accompany and help special needs children, and two were IT teachers. While six of the eleven teacher actively participated in the training programme, the other five were supporting the ones in training during lessons. The study was conducted over a period of approximately three years. Data collection began at the end of the students' second grade in primary school, in the school year 2009/2010, with the INVALSI state testing. Finally, the last data was collected at the end of the students' fifth grade, during the school year 2012/2013, at which time INVALSI state testing and the evaluation of learning climate and student motivation took place.

The training for each topic was organised in three phases. The input, practice and reflection phases of each topic were distributed over a time of approximately three months. The programme mainly taught competences relating to management of IT, handling of a classroom, and the didactic processes of leading an IT-related class.

At the beginning of the project, teachers together with the project staff analysed the INVALSI results, in a specially adapted version of the INVALSI records to clarify the students' abilities. Hence, it was highlighted what knowledge, skills, and abilities students needed to improve in. Consequently, teachers and staff planned LSA activities to improve the abilities in need of practice. The activities, materials, and software applied were specificially made to target those abilities that had to be further developed.

During the next step, the teachers tried to apply with their students in the classroom what they had planned beforehand. Afterwards, the success of the lessons was evaluated on two levels: the students' results and motivation, and the didactic results of the teachers. Thus, during the next planning phase the

teachers' reflection results from the past classroom lessons would be used to enhance the planning and conduction of the next LSA activities in the classroom.

The students' motivation to learn was measured using the Academic Self-Regulation Questionnaire (SRQ-A), developed by Ryan and Connell (1989) and translated to Italian for the purpose of the current study. The SRQ-A consists of questions about four behaviours related to academic learning in the classroom: doing homework, working on tasks during lessons, answering questions in class, and trying to do well in school. Moreover, each question has four response options corresponding to the reasons for academic achievement behaviours, namely external, introjected, identified, and intrinsic motivation (Ryan & Connell, 1989). In this study, the relative autonomy index (RAI) was applied to summarise the individual students' motivational tendencies (Self-determination Theory 2016). The more positive the RAI the more autonomous is the motivation of a student and vice versa.

The internal validity of the individual subscales of the translated SRQ-A version in the given sample was good, the only exception being the identified motivation subscale at the first testing with a Cronbach alpha value of .69 which is just below the usually desired value of at least .7. However, since the mentioned subscale reaches a Cronbach alpha value of .86 at the second testing and deleting an item from the scale would not have improved its validity, the test was nevertheless considered internally valid despite the slightly low Cronbach alpha value.

For measuring the classroom climate, a scale based on cooperative learning theory called "Questionario sulle preferenze di clima" was used (Miato 2004, 65-67). Measuring various facets relevant for classroom climate, the scale consists of three subscales called competitive, individualistic, and cooperative climates. Items include statements such as "In class, if I can choose, I prefer working with my other classmates" and "In class, I like to do things alone", which are rated by the students on a scale from "1 = very true" to "4 = not true at all".

The internal consistency of the classroom climate subscales in this sample was satisfactory with the competitive climate reaching a Cronbach alpha value of .86 while the Cronbach alpha values of the individualistic and cooperative climates were .82 and .83 respectively. Hence, the internal validity of all three subscales was above the minimum accepted value of .7.

The students' competences were measured representatively using the Italian INVALSI state testing results from the subjects Mathematics and Italian at the end of the second and fifth grade, respectively. The results from the standardised INVALSI state testing at grade levels two and five in 2010 and 2013 were used correspondingly. Moreover, in case further information is needed, the INVALSI tests are described in detail in the reports from which the given material was taken (Invalsi 2011, 2016; Invalsi 2013, 2016).
The internal validity at grade level two was .81 for the Mathematics test while a value of .88 was reached by the Italian test, which was satisfactory in both cases (Invalsi 2011, 2016). Furthermore, the Cronbach

alpha values for the Mathematics and Italian INVALSI tests at grade level five were .89, meaning that they were internally valid as well (Invalsi 2013, 2016).

Results

The data processing was conducted using IBM SPSS Statistics Version 23. The motivation data collected at T1, before and at the beginning of training, was combined with the results of the INVALSI state testing of T1 while the motivation data, INVALSI state testing, and classroom climate from T2, at the end of the study period, were integrated as well. Afterwards, the data sets from T1 and T2 were added into one joined data set. Moreover, the INVALSI, motivation, and classroom climate results were checked for outliers and the classroom climate and motivational data were tested for linearity and normality. Both classroom climate and motivational data were reasonably close to a normal distribution. Furthermore, the INVALSI test results were normalised.

A binary logistic regression was run with the categorical group variable, whose two values consisted of control and experimental condition, as dependent variable. Moreover, the (independent) predictor variables included in the model were Mathematics and Italian INVALSI at T2, motivation at T2, classroom climate at T2, use of interactive whiteboards in class, and personal use of computers or tablets during lessons. The sample size, n=99, was neither very large nor very small, thus, collapsing or deleting categories was unnecessary. The issue of multicollinearity, meaning high inter-correlation between predictor (independent) variables, was controlled for. There were no high inter-correlations in the independent variables included in the model, meaning it was not necessary to exclude a variable due to inter-correlation with another variable. Based on the first model above, a second binary logistic regression was run with one block of data entry but this time using more detailed subcategories of the INVALSI mathematics and Italian scores. The dependent variable remained the same as before. The INVALSI test scores included for the mathematics and Italian INVALSI tests were chosen depending on their inter-correlation, which for the applied method should not be too high (usually below .7, to avoid multicollinearity). Due to correlational coefficients above the accepted threshold, six subcategories had to be excluded for the purpose of the analysis. The scores included for the INVALSI mathematics test were numbers, data and predictions, space and figures, and relations and functions, while the test scores of comprehension, detecting information, and rewriting texts were used from the INVALSI Italian test. Furthermore, the competitive, individualistic, and cooperative climate scores and the motivational score were included as independent variables.

Model 1

In the logistic regression, the data from n=99 students, 52 from the control and 47 from the experimental group, was used. The Omnibus Tests of Model Coefficients is significant with a chi-square value of 23.166 and a significance level of .003, df=8, thus, the goodness of fit is satisfactory, and, hence, the model does predict the experimental versus control group participants better than the first guess without predictors

(independent variables) according to this test. Additionally, the Hosmer and Lemeshow Test, which according to SPSS is supposed to be the most reliable test of model fit is non-significant, which indicates that the model is a good fit, with a chi-square value of 8.069 and a significance level of .427, df=8. The Cox & Snell R Square and the Nagelkerke R Square values are .209 and .278 respectively, indicating between 20.9 and 27.8 percent of the variability in the dependent variable is explained by the given model. Out of the total number of cases, 68.7 percent are correctly classified after the predictors were introduced, in comparison to 52.5 percent without the predictors, suggesting that the predictors improve the model. Moreover, 73.1 percent of the control group participants are correctly classified while 63.8 percent of the experimental group participants are appropriately categorised.

Expectedly, only one slight outlier, ZResidual=2.73, with values above 2.5 being considered outliers was found in this sample, since it was already controlled for outliers before running the given logistic regression. Due to it being only one slight outlier it remained in the sample instead of being excluded.

According to the results, only the frequency of the interactive whiteboard usage (p=.012) and the students' personal use of computers or tablets (p=.001) significantly predict the affiliation with either experimental or control group. While the use of interactive whiteboards increased the odds of a student being in the experimental group (B=.762), the use of computers or tablets decreased them (B=-1.071).

The odds ratio Exp(B)=2.14 indicates that students using interactive whiteboards more frequently were 2.14 times more likely to be in the experimental group than those who used it less. Note that neither the confidence interval of the interactive whiteboard usage nor the one of the computer use included the value 1. Hence, while in case of the interactive whiteboard it is above one, it is below one for the computer use, meaning that the first factor increases the probability of having been in the experimental group and the second decreases it.

TABLE 1 VARIABLES IN THE LOGISTIC REGRESSION EQUATION IN MODEL 1.

							95% C.I.for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Mathematics T2	-,015	,022	,439	1	,508	,986	,944	1,029
Italian T2	-,005	,029	,031	1	,861	,995	,940	1,053
Interactive whiteboard use T2	,762	,305	6,250	1	,012	2,143	1,179	3,894
Computer use T2	-1,071	,332	10,434	1	,001	,343	,179	,656
Motivation T2	-,046	,134	,118	1	,731	,955	,734	1,243
Competitive Climate T2	,109	,453	,058	1	,809	1,116	,459	2,711
Individualistic Climate T2	,563	,630	,799	1	,371	1,757	,511	6,042
Cooperative Climate T2	,831	,486	2,920	1	,087	2,296	,885	5,957

Note. Fields highlighted in grey are significant with values below .05.

Model 2

Given the results of the first regression model, another logistic regression was run with n=99 students, 52 from the control group and 47 from the experimental group. The Omnibus test of model coefficients is significant (p=.002) with a chi-square value of 32.784, df=13, the Hosmer and Lemeshow test is non-significant (p=.619) with chi-square of 6.256, df=8. The results of both mentioned tests indicate that the model is a good fit for the data. According to the Cox and Snell R square value of .282 and the Nagelkerke R square value of .376, between 28.2% and 37.6% of variability in the dependent variable is explained by the model. Additionally, with the predictors entered into the model in 73.7% of the cases the affiliation to either control or experimental group was predicted correctly.

Only one slight outlier, ZResidual=2.503, was found in this sample, since it was already controlled for outliers before running the logistic regression. Cases with values above 2.5 tend to be considered outliers. However, due to it being only very slightly above the threshold for outliers it remained in the sample instead of being excluded. According to the results, three variables make a significant impact on the model's predictions. The rewriting of texts (p=.025), the frequency of the interactive whiteboard usage (p=.004) and the students' personal use of computers or tablets (p=.001) significantly predict the affiliation with either experimental or control group. While the use of interactive whiteboards increased the odds of a student being in the experimental group (B=.934), the use of computers or tablets decreased them (B=-1.190). The ability to rewrite texts slightly decreased the odds of students being in the experimental group (B=-0.058).

The odds ratio Exp(B)=2.55 indicates that students using interactive whiteboards more frequently were 2.55 times more likely to be in the experimental group than those who used it less. Note that as in neither the confidence interval of the interactive whiteboard usage nor the one of the computer use included the value 1. Furthermore, the same was true for the text rewriting skill, whose lower and upper boundaries were both below the value 1. Hence, while in case of the interactive whiteboard it is above one, it is below one for the computer use, meaning that the first factor increases the probability of having been in the experimental group and the second decreases it. The cooperative climate was close to being significant (p=.061) with the odds of belonging to the experimental group increasing (B=.990) with it. However, the confidence interval includes the value one with which the effect changes direction, and, hence, not much can be deduced from the given result of the cooperative climate.

TABLE 2 VARIABLES IN THE LOGISTIC REGRESSION EQUATION IN MODEL 2.

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Numbers	,005	,018	,087	1	,768	1,005	,971	1,041
Data and predictions	,026	,019	1,810	1	,179	1,026	,988	1,065
Space and figures	-,018	,015	1,363	1	,243	,983	,954	1,012
Relation and functions	-,016	,017	,885	1	,347	,984	,951	1,018
Italian comprehension	-,001	,027	,000	1	,982	,999	,947	1,054
Italian information detection	,021	,015	1,834	1	,176	1,021	,991	1,052
Italian rewriting text	-,058	,026	5,049	1	,025	,943	,896	,993
Motivation	-,039	,148	,070	1	,791	,962	,719	1,285
Competitive Climate	,027	,514	,003	1	,957	1,028	,375	2,817
Individualistic Climate	,707	,690	1,051	1	,305	2,029	,525	7,845
Cooperative Climate	,990	,529	3,500	1	,061	2,691	,954	7,593
IWB use	,934	,325	8,267	1	,004	2,545	1,346	4,811
PC use	-1,190	,352	11,402	1	,001	,304	,152	,607

Note. Fields highlighted in grey are significant with values below .05, fields with values slightly above .05 are highlighted in light grey.

Conclusion

In the following, the main results of the correlations between the study variables and the results of the two logistic regressions are discussed in order to evaluate the method of indirectly measuring training success via the variables of student achievement, motivation, and classroom climate introduced in this work. Finally, the general advantages and challenges of the given approach to teacher training evaluation will be discussed.

Overall, the teacher training programme was expected to positively influence the students' Italian and mathematics INVALSI scores, their motivation, and their perception of the classroom climate, leading to improvements in comparison to the control group students. However, the only two factors found to predict a student's affiliation with either control or experimental group were the frequency of use of the IWBs and the personal student use of computers or tablets in class. On the one hand, a higher frequency of using IWBs predicting experimental group affiliation is understandable since, as mentioned previously, the teacher training programme involved, amongst other topics, the use of IWBs. On the other hand, it is debateable why a higher frequency of personally using a computer or tablet during lessons was an indicator that students belonged to the control group. As mentioned above, one possible reason could be that students who used the IWBs recalled their use more dominantly and consequently underestimated the amount of times they personally used computers or tablets in comparison to the more extraordinary or novel IWBs. Another possibility is that only a certain total percentage of lessons was spent using technology – be it computers or IWBs – so that the experimental classes used IWBs instead of and in

addition to computers, while control classes used mainly computers and perhaps now and then IWBs. Lastly, IWBs could have additional benefits, such as interactivity, in comparison to computers resulting in the use of the latter being less relevant or necessary.

The non-existing predictive power of the student achievements in Italian and mathematics and the motivation for the experimental and control group affiliation could be due to, for instance, control group effects or poor transfer. While the latter is unlikely since transfer seemed to have taken place to at least some degree, the former is more probable. On the student as well as the teacher level, group effects could have been responsible for counterbalancing training effects. Hence, compensatory rivalry between either the teachers of the control classes, their students, or both could have resulted in the similar student achievements of both groups. Thus, even though some threats to internal validity such as maturation can be eliminated as inapplicable to the current study, others could have had an impact.

The absence of the expected relation between the teacher training programme and the student-related variables could have been due to a number of difficulties in the given study. First, it cannot be ruled out that teachers from the control group took part in other training programmes during the three-year study period. Moreover, the study had certain limitations such as the very small teacher sample with only six teachers receiving training. Hence, if certain teachers were liked or disliked by the students or their behaviour in terms of, for instance, humour was inadequate, it could already influence the student population significantly. Even new teachers in either the control or experimental classes between the end of the second grade when the first INVALSI state testing occurred and the third grade when teacher training started could have influenced the study results since teachers are integral to student achievement (Rockoff 2004).

The second logistic regression shows some indications that using the less general INVALSI scores can show relations between student competences and teacher training. However, the effect found was very small. A probable cause is that the more distal the effect is from the training programme the more difficult it is to find a significant result. The frequency of using interactive whiteboards or computers in class are the variables, which are closest to the training programme in terms of transfer. Thus, it seems plausible that these are the variables for which an effect was found. Following the frequency of using the two media, the classroom climate and motivation are a little more distant from the training programme and, hence, to result in changes it requires more distal transfer than the use of media in class. Ultimately, the largest distance exists between the student achievement and the teacher training since, for instance, motivation influences the learning and achievement of students.

In general, assessing the effectiveness of teacher training programmes using student-related variables like student achievement, motivation, and classroom climate, has certain limitations since it is a rather indirect approach to training evaluation. Theoretically, teachers could “cheat” the testing system by

teaching to the test so that their students get good test scores without truly learning and understanding the underlying skills and cognitive processes. Moreover, to see effects in student-related variables transfer definitely has to have occurred, otherwise, there can be no training related effects. Depending on the variables, the transfer results measured are more proximal to the training programme or more distal. It seems plausible, that finding significant changes in variables that only require proximal transfer is more likely than in variables for which, for them to be affected, distal transfer has to have occurred. Additionally, students need to be open to change and be ready to get involved in novel teaching styles to truly benefit from the opportunity to improve their learning experience using skills and knowledge the teachers gained from training. Finally yet importantly, many factors influence student achievement, not the least of which are, for instance, contextual factors such as the students' socioeconomic backgrounds (Sirin 2005).

Nonetheless, advantages and benefits of evaluating teacher training programmes using student-related variables may outweigh the disadvantages. Previous research has indicated that teacher quality can significantly influence student achievement (Rockoff 2004). Hence, it would be remiss not to utilise student achievement in teacher quality evaluation because high quality teaching is the overall aim of most if not all available teacher training programmes. State testing, especially, is implemented regardless of teacher training and the outcomes are readily available to teachers providing data for pre-training and post-training, which can be compared across classes or schools. Moreover, state testing results offer comparable standardised measures of student achievement. Thus, to use state testing results to evaluate the effectiveness and success of teacher training programmes is effective in terms of cost and time since the tests are conducted independently from the training and do not have to be administered by the trainers. Pre-training test results can be used to inform the training programme concerning the training needs. Overall, it is important to not only measure proximal but also distal transfer of the training contents. For training to be able to achieve its full potential in terms of its effects in the work environment it needs to be widely transferred. Hence, being able to measure effects of training using variables that differ in the kind of transfer necessary for them to be effected is worthwhile since it will offer opportunities to achieve a deeper understanding of the transfer, which took place for a specific training programme.

References

Aguinis, H., Kraiger, K. 2009. "Benefits of training and development for individuals and teams, organizations, and society", Annual review of psychology, Vol. 60, pp. 451-474.

Beauchamp, G. 2004, "Teacher Use of teh Interactive Whiteboard in Primary Schools: towards an effective transition framework", Technology, Pedagogy and Education, Vol. 13, No. 3, pp. 327-348.

Boscolo, P. 2016. "Le prove INVALSI, ovvero: Il difficile cammino della scuola verso una cultura della valutazione e dell'apprendimento", Giornale Italiano di Psicologia, Vol. 43, n. 3.

Fraccaroli, F., Pisanu, F. 2016. “Prove INVALSI come strumento di gestione e sviluppo organizzativo”, Giornale Italiano di Psicologia, Vol. 43, n. 3, pp. 81-86.

Gagné, M., Deci, E. L. 2005. “Self-determination theory and work motivation”, Journal of Organizational Behavior, Vol. 26, pp. 331-362.

Gentile, M., Pisanu, F. 2013. “Integrating technology and teaching with Learning Solutions”, Learning & Teaching with Media & Technology, ATEE-SIREM Winter Conference Proceedings, pp. 272-286. ATEE, Genoa, Brussels.

Goldstein, I. L., Ford, K. 2001. “Training in Organizations. Boston”, Wadsworth Publishing Co Inc, MT.

Invalsi 2011, 2016, September 14. Retrieved from Invalsi: http://www.invalsi.it/snv1011/documenti/prove_invalsi_2011_prime_valutazioni_sintesi.pdf, accessed on 11th March 2017.

Invalsi 2013, 2016, September 14. Retrieved from Invalsi: http://www.invalsi.it/snvpn2013/rapporti/Sintesi_Rapporto_SNV_PN_2013_08.pdf, accessed on 11th March 2017.

Johnson, D. W., Johnson, R. T. 2009. “An educational psychology success story: Social interdependence theory and cooperative learning”, Educational researcher, n. 385, pp. 365-379.

Lepper, M. R., Corpus, J. H., Iyengar, S. S. 2005. “Intrinsic and Extrinsic Motivational Orientations in the Classroom: Age Differences and Academic Correlates”, Journal of Educational Psychology, Vol. 972, pp. 184-196.

Mazer, J. P., Murphy, R. E., Simonds, C. 2007. “I’ll See You On ‘‘Facebook’’: The Effects of Computer-Mediated Teacher Self-Disclosure on Student Motivation, Affective Learning, and Classroom Climate”, Communication Education, pp. 1-17.

Miato, L. 2004. “Le buone pratiche inclusive della scuola elementare trentina”, Trento, IPRASE, Provincia autonoma di Trento.

Mumtaz, S. 2000. “Factors Affecting Teachers' Use of Information and Communications Technology: a review of the literature”, Journal of Information Technology for Teacher Education, Vol. 9, pp. 319-342.

OECD. 2016, September 6. Retrieved from Better policies for better lives: https://www.oecd.org/pisa/, accessed on 11th March 2017.

Rockoff, J. E. 2004. “The impact of individual teachers on student achievement: Evidence from panel data”, The American Economic Review, n. 942, pp. 247-252.

Ryan, R. M., Connell, J. P. 1989. „Perceived locus of causality and internalization: Examining reasons for acting in two domains“, Journal of Personality and Social Psychology, n. 57, pp. 749-761.

Ryan, R. M., Deci, E. L. 2000. “Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions”, Contemporary Educational Psychologym n. 25, pp. 54-67.

Sackett, P. R., Mullen, E. J. 1993. “Beyond formal experimental design: towards an expanded view of the training evaluation process”, Personnel Psychology, pp. 613-627.

Salas, E., Tannenbaum, S. I., Kraiger, K., Smith-Jentsch, K. A. 2012. “The science of training and development in organizations: What matters in practice”, Psychological science in the public interest, n. 132, pp. 74-101.

Self-determination Theory. 2016, August 21. Retrieved from http://selfdeterminationtheory.org/self-regulation-questionnaires/, accessed on 11th March 2017.

Sirin, S. R. 2005. “Socioeconomic Status and Academic Achievement: A Meta-Analytic Review of Research”, Review of Educational Research, Vol. 75, No. 3, pp. 417-453.

Skinner, E. A., Belmont, M. J. 1993. !Motivation in the Classroom: Reciprocal Effects of Teacher Behavior and Student Engagement Across the School Year”, Journal of Educational Psychology, Vol. 85, pp. 571-581.

Stuart, W. D., Rosenfeld, L. B. 1994. “Student perceptions of teacher humor and classroom climate”, Communication Research Reports, n. 11, pp. 87-97.

Tondeur, J., van Braak, J., Valcke, M. 2007. “Curricula and the use of ICT in education: Two worlds apart?”, British Journal of Educational Technology, Vol. 38, pp. 962-976.

Zahn, G., Kagan, S., Widaman, K. F. 1986. “Cooperative learning and classroom climate”, Journal of School Psychology, Vol. 24, pp. 351-362.

STILL LIVE LEGACY OF B. F. SKINNER: PROGRAMMED LEARNING ELEMENTS IN THE CURRENT APPLICATIONS FOR CHILDREN

LENKA BENEDIKTOVÁ
JAN KRÁL
Faculty of Education
University of West Bohemia, Czech Republic

e-mail of corresponding author:kralj3@kvd.zcu.cz

Key words: Programmed learning, Educational application, Educational mobile application, Applications for iOS, iPad.

Abstract: Programmed learning is a pedagogical direction, whose origin dates back to the fifties of the last century. Its founders are B. F. Skinner and S. L. Pressey. Programmed learning is based on five key pillars, principles that influenced the later development in various areas of education, particularly in the field of e-learning. Are those principles still relevant? How much are they contained in the current form of educational applications?

The following paper presents the different principles of programmed learning in their original and current form as we can find it in the current educational applications. We use not only research of domestic and foreign sources, but also analysis of educational mobile applications for iOS. Considering the professional focus of the research team, applications from the field of natural science useful for teaching students aged 11-15 years were included in the sample of applications. During the analysis there were searched programmed learning elements, specifically principle of active responding, principle of reinforcement, principle of small steps, principle of self-pacing and principle of evaluation and program revision

The research results implies that in the applications it is being worked with all principles of programmed learning and Error-based work appears. Although the principles often do not match the original concept of programmed learning.

Aim of our work is not only revive the link B. F. Skinner and answer the question of the viability of the principles of programmed learning today, but also introduce applications that use and further develop these principles.

Introduction

Programmed learning (or programmed instructions) is a method of learning which dates back to the fifties of the last century. The founders were S. L. Pressey and B. F. Skinner. The origin of some of the thoughts, which later served as a base for formation of programmed learning, extends even to the ancient world or to J. A. Komenský (Vinšálek 1969).

It was a problem which teachers face to these days that was an important impulse for the origin and, above all, the development of programmed learning. The problem is related to the increase of the curriculum, which is caused, among other things, by technology development and human evolution, in other words, by the increase of knowledge (Vinšálek 1969, Liškař 1981, Kulič 1966, 130).

Programmed learning influenced later development of various fields in education, especially in the area of e-learning. Yet, it may seem today that this method of learning is outdated. The original state, represented by teaching machines, is really just a history now. However, the principles of programmed learning themselves find their place in present days too, namely in various fields of education and educational research. Programmed learning is applied in the field of Cybernetic Pedagogy research (Aberšek et al. 2014) and in the concept of individual learning (Durmuscelebi 2013). It is used in the areas of theoretical teaching of Physical Education and Sports (Becea, Pelin 2013), Technical Education (Lugarić, Kostanjčar, Petković 2005), Chemistry (Izzet Kurbanoglu, Taskesenligil, Sozbilir, 2006) and others. It obviously plays a role in different forms of e-learning (Kjell, 1998, Gangur, Martinovský, 2012, Gangur, Martinovský, 2013).

In the research, we decided to focus on mobile applications for education in the field of Biology which may be used for teaching children at the age of 11 to 15. We determined to find out to what extent they are in compliance with the programmed learning principles. We do not expect that the modern applications would fully comply with the principles of the programmed learning. Nevertheless, we are convinced that certain elements, ideas or parts of modern applications are in line with the programmed learning principles and the individual principles find their use in modern education, albeit in a different form.

Theoretical bases

Definition of programmed learning - *"We understand programmed learning as a science discipline which is rooted in educational psychology. To comprehend the nature of programmed learning means to understand basic learning principles and laws, which were developed many years ago and conceived particularly by Watson, Thorndike, Pressey, Skinner, Crowder, Pask, Landa and others"* (Vinšálek 1969).

It is very complicated to sum up the core of programmed learning in a simple definition: *"In the broadest sense, we understand that programmed learning is a controlled process with small but logically closed educational sections, where the pupil is active"* (Liškař 1981, 6). In a simplified approach, it is possible to see programmed learning as *"an intentional process forming pupils through programmed learning resources"* (Formel 1991, 18).

Based on the approach of programmed learning by B. F. Skinner, we may understand programmed learning as a controlled learning process, based on the learning laws. The principles of programmed learning are then the rules how to organize natural conditions and learning process so that these principles may be applied (Tollingerová et al. 1966). And this is the point where we get to the programmed learning principles. The principles of B. F. Skinner (1968) may be considered to be the best known and the most widespread approach to programmed learning principles (Hoskova-Mayerova, Rosická, 2012).

Programmed learning principles

- Principle of active responding
- Principle of reinforcement
- Principle of small steps
- Principle of self-pacing
- Principle of evaluation and program revision

Although we come out particularly from the Skinner's meaning of programmed learning principles, we expand our view by approaches of some other significant innovators in programmed learning.

Principle of active responding - "*Learning is effective in that moment when it is provoked by a problem or a question and when it is proved in a separately formed mostly correct and clear answer"* (Tollingerová et al. 1966, 17).

"The principle of active responding is based on generally valid knowledge from educational psychology. The pupil learns better if he is somehow active during the learning process" (Liškař 1981, 19).

The original application of the principle of active responding into practice is in the form of learning materials which consist mostly or only of questions to which pupils need to find answer. The questions may have various forms, from mathematical examples, over filling a proper expression in a sentence, to solving a problem. The explanation of the learning material is presented minimally or is completely missing. The work out of learning materials, considering the principle of active responding, is evident if you look at some teaching tools, eventually at programmed text books (Tollingerová et al. 1966*)*. When we talk about the form, which is given to learning material by the principle, it is necessary to realize that the result form is actually a union of all the five principles of programmed learning and it is not really possible to separate the impact of one from the others.

Principle of reinforcement - "*Learning is effective in that moment when every included activity is fixed by knowledge of its result, when such knowledge is accompanied by awareness of success and when it is sufficiently frequent, immediate and continuous"* (Tollingerová et al. 1966, 19).

"The principle of immediate reinforcement expresses a requirement that the pupil should be informed about his quality of performance after each step, each answer to a question" (Liškař 1981, 19).

The principle of reinforcement is closely connected with the principle of active responding. The teaching process consists of individual questions or issues and the pupil should answer to them and after that is informed about the quality of his answer. The core of the principle of reinforcement is a feedback. The feedback is integral to teaching process. The principle of reinforcement requests to reinforce or strengthen the process immediately after the pupil answers though. Therefor it is necessary to get an immediate feedback.

Principle of small steps - *"Learning is effective in that moment when it is served in small batches and small steps and when it is organized in the way that each pupil has his own instructor"* (Tollingerová et al. 1966, 20).

"The principle of small steps allows dividing the learning material into sub-tasks, sub-questions or sub-operations and orders them into certain chain or sequence" (Liškař 1981, 19).

There also arises a question of defining small steps. How big should be the steps? How much should be the study material divided to achieve the biggest effectivity in learning? One of the points of view to the problematics of the size of steps, which is mentioned by Vinšálek in his book (1969,17), is: *"Learning material is divided into elementary batches, so called steps. The level of elementarity of a step is relative. What seems to be elementary in one system does not have to be elementary in another one. The elementarity always depends on the level of pupil's development. It is necessary to consider age and individual peculiarities of the pupils."* From our view of today, it would be suitable to add that it is also important to consider the character of the working material while putting the steps in the order.

B. F. Skinner holds the view that a step should be so small to limit the errors to minimum. Nevertheless, in compliance with the previous opinion it is obviously necessary to find an optimal step size, hidden somewhere between too short steps and too long steps. *"Based on the given steps, if a pupil does not understand the following learning material, it is a signal that the step was too long and the rule was broken. On the other hand, too short steps do not wake up activity at pupils, they decrease their motivation and may be boring"* (Vinšálek 1969, 17).

Looking at the application of the principle of small steps now, it is essential to focus on the proper division of the learning material into elementary parts. At the same time, the size of individual parts or steps must be subject to the character of the learning material, age and individual peculiarities of the learners. In practice, the principle of small steps may be applied in the following way. Take a large complete topic, divide it into learning activities which are interconnected between each other and that prevents the atomization of knowledge and may be so large to allow solving even more complex problems. The point is to find the right balance between the huge unit and the small steps.

Principle of self-pacing - *"Learning is effective in that moment when the reinforcement is given immediately but on the other hand so quickly to make it suitable for each pupil with his individual possibilities"* (Liškař 1981, 18).

"The principle of self-pacing expresses a requirement that the pupil should be able to move from one step to another at his own discretion" (Liškař 1981, 19).

The idea of the principle of self-pacing comes out from the individual need of the pupil. Each child has different needs regarding the speed and that relates even to the time needed to acquire certain knowledge, activities, to solve a problem etc. In frontal teaching, there is a rule that some pupils do understand the material better and some other are not able to manage it in the time given to learn. Time for the individual teaching-learning activities depends on the needs of the majority or on the needs of the slowest ones. This fact belongs to disadvantages of frontal teaching. Its influence is felt by both pupils and teachers. The principle of self-pacing leaves pupils to fill in the individual study activities according to their own

individual needs. That is an important aspect which increases motivation of learners and overall increases the efficacy of the learning process.

Principle of evaluation and program revision - *"The efficacy of learning is the higher the more precise is the evaluation and program revision of each part of it, at each moment and for each learning individual"* (Tollingerová et al. 1966, 27).

Unlike the previous four principles serving to optimize learning conditions, the fifth principle is focused on the optimization of evaluation and program revision.

Whether we look at the principle of evaluation and program revision from the point of B. F. Skinner or any other specialist on programmed learning, there is always a consensus in the aim of its effort. The principle of evaluation and program revision is effort to optimize a tool of programmed learning, to bring it in the optimal form. From the point of view of modern applications for education, we may state that it is the evaluation which represents a tool of evaluating to us and gives us a feedback necessary for making good-quality applications for education.

Error-based work - Although this is not one of the principles of programmed learning, the question of how to work with errors or mistakes is fundamental part of programmed learning. *"Is it good to learn through learning without errors or with them?"* (Kulič 1971, 6)

In the theory of programmed learning, we can see two completely opposite opinions to this question. Questions are the main tool of programmed learning, they evoke and control the learning process. According to B. F. Skinner, the answers to those questions are, above all, the acts of learning. The aim is to call up these answers and fix them. B. F. Skinner rejects any negative, aversive fixation and requires to get at least 95% correct questions, which actually eliminates errors in learning (Skinner 1968). The opposite opinion can be seen e.g. at N. A. Crowder. He finds responses to be primarily acts of diagnosis. They provide information on the actual achieved stage of the subject and decide about further procedure of learning and its management. In this case, the error forms an integral part to the learning process. *"Learning without errors cannot itself guarantee a good acquirement and on the other side, errors in the learning process do not exclude that"* (Kulič 1971, 10).

In our point of view, error-based work forms a fundamental part of the principle of reinforcement. Learners should be informed whether he made a mistake and if so, he should learn about the nature of the error, alternatively the level of error and ideally the reason why he had made the error. The answer to a question: "Why did I make a mistake?" is really useful for the learner to help him understand the problem (Kulič 1971). It is not a condition of a feedback to tell the learner the correct solution. The learner must achieve the right solution, but he may work with errors to choose the way how he would reach it.

Methodology

In the research we have analysed the application for mobile device with operating system iOS (iPad), which may be used during the lessons of Biology at elementary schools in the Czech Republic. Biology is learnt by pupils at the age of 11-15. In our analysis we have focused especially on the applications which are free to download at AppStore. Unfortunately, there are not many applications for free and most of the mentioned applications may be downloaded for free in the limited version. If a teacher wants to use all functions of the application, he is obliged to pay its extension. The analysed applications were divided into two groups. The first group belonged to the analysis of final applications with certain specialization. The second group included the evaluation of the applications which help teachers to prepare learning materials and therefor they may be used in other fields too, not only in Biology. The analysis was focused on presence of programmed learning principles. For better orientation, we have made a table and placed there questions which helped us finding out about the presence of programmed learning principles (see the table 1). To get better comparison of individual applications, we have used only the scale of 2 answers: 1 for yes and 0 for no.

TABLE 1. REPRESENTATION OF PROGRAMMED LEARNING PRINCIPLES

Principle of active responding	Principle of reinforcement	Principle of reinforcement	Principle of small steps	Principle of small steps	Principle of self-pacing	Principle of self-pacing	Principle of evaluation and program revision	Work with error
Does the application require active approach of the pupil?	Does the pupil get a feedback during the work with the application ?	Does the pupil get any explanation within the given feedback?	Is the application divided in the adequate steps?	Does the application allow more than just one activity?	May the pupil set up a level of difficulty in the application ?	May the pupil work with the application independently?	Does the application offer a possibility to evaluate and give a feedback to its authors?	Does the application allow making a mistake?

Source: own

Based on the variety of applications, we were interested also in some other details, among other things, we tried to find out how many active elements of learning the application has, whether the feedback is immediate and what form it is, how much time the application activities require, if the application is limited by time and how the application works with errors.

We have approached the research the way that we did not look for an ideal application from the point of programmed learning. This was, according to our initial consideration, not too much probable or such a result would be really surprising. Therefor we focused on the individual principles of programmed learning, or ideas on which the individual principles are built on.

Principle of active responding - From the beginning, we approached to the principle of active responding with no effort to find the principle of active responding in its original version. The possibility

that we would find it in the applications for education was not too realistic. That means we were searching for the idea on which the principle of active responding is built on. The idea, which the Principle of active responding comes out, is in the effort to involve the pupil actively in the learning process, when the pupil is no more just a passive recipient of information. Any educating activity which makes the learner "to think" or gives them the opportunity to react in a certain way may be an active reception of information (Maňák 1998). In ideal case, the pupil actively receives information actively during all the work with the application for education.

Applications for education may be formed by various educational elements. A learning text and most of the audio-visual tools (video, sound records and non-interactive animations and pictures) serve mostly to passive reception of information. On the contrary, questions, tests, tasks in the form of interactive animations and various game elements may serve to involve pupils actively.

Principle of reinforcement - The existing form of the principle of reinforcement in Edu applications is visible in form of a feedback on individual activities performed in applications for education. We were analysing whether pupils get any feedback during the individual activities, whether it is an immediate feedback and in what form is the feedback given.

Principle of small steps - During the research on the principle of small steps, we analysed whether the application for education is divided into different sub-activities or whether it is just one activity and at the same time what is the size of individual activities from the point of time and included learning material.

Principle of self-pacing - While working on the research on the principle of self-pacing, we faced a problem of what is really possible to analyse. We tried to find out whether the application allows pupils to work according to individual needs. We have not tested whether it really corresponds with the principle of self-pacing, just whether it allows self-pacing. The thing is that it is hard to determine for a significant part of tested applications whether the application is in accordance with the principle of self-pacing. In case of tested applications, it is up to the teacher and his approach, material conditions and the way of using the application. Even assuming that the material conditions are ideal and every pupil has his own mobile device and application available, it will still depend on the way the teacher decides to use the application and how he implements it in the concept of his lesson.

The principle of evaluation and program revision - is the most problematic, considering the possibilities of the research. All mobile devices offer due to their distribution systems the possibility to evaluate the application by its users and this way give a feedback to its creator, whether it is for android or iOS. You can find a bookmark Feedback at each application available at AppStore. After clicking on the bookmark it may pop out a star system (where the user can evaluate the application from 1 to 5 stars) or specific reviews by other users. Yet it is impossible to decide whether the authors follow the feedback and

optimize their applications. So we may say that the analysed applications are in compliance with certain version of the principle of evaluation and program revision, yet we cannot confirm that they really meet this principle.

Error-based work - During the research we also focused on the way the applications for education work with errors. We were looking whether the applications let pupils make a mistake, whether they work with the mistakes and in which way.

Results

As already mentioned, the analysed applications were divided in two groups. See the list below with the results of the research.

EduApps for Biology teachers - The first group of the analysed applications were already finished applications with specialisation on Biology. These applications were most of the time closely related to a particular topic. In all cases are these applications available online for free in basic version only (lite), the full version of application is unlocked after paying a fee. See the table 2 showing the presence of individual principles of programmed learning.

Having 10 applications for the research, we noticed the principle of active responding at half of them. The rest of the applications did not content any element which would place the pupil into a different role from the passive recipient of information. We found the principle of reinforcement at half of the applications too. However, it is always just information whether the pupil answered correct or not (some texts are accompanied by a convenient sound), no extra explanation to the answer appears in the analysed applications. By contrast, the principle of small steps is present in all the applications. As mentioned above, the applications are focused on relatively limited topics and their structure is clearly and logically ordered. The principle of self-pacing was found in all the applications for the pupil can manage to work with all of them by himself, according to his individual needs. It is even possible to set up the level of difficulty at one of the applications. The last searched principle, the principle of evaluation and program revision, may be looked up in all the analysed applications too.

TABLE 2. PROGRAMMED LEARNING PRINCIPLES AND THEIR REPRESENTATION IN EDUAPPS FOR BIOLOGY TEACHERS

Principles	**Question**	Build a Body	Atlas ptáků	BioIQ	Animals	Botany	iCell	Organs 3D	Plant Net	Dinos 360	3D Brain	**Σ Principles**
Principle of active responding	Does the application require active approach of the pupil?	1	0	1	1	1	0	0	0	1	1	5
Principle of reinforcement	Does the pupil get a feedback during the work with the application?	1	0	1	1	1	0	0	0	1	1	5
Principle of reinforcement	Does the pupil get any explanation within the given feedback?	0	0	0	0	0	0	0	0	0	0	0
Principle of small steps	Is the application divided in the adequate steps?	1	1	1	1	1	1	1	1	1	1	10
Principle of small steps	Does the application allow more than just one activity?	0	1	1	1	1	0	0	1	1	0	7
Principle of self-pacing	May the pupil set up a level of difficulty in the application?	0	0	0	0	0	0	1	0	0	0	1
Principle of self-pacing	May the pupil work with the application independently?	1	1	1	1	1	1	1	1	1	1	10
Principle of evaluation and program revision	Does the application offer a possibility to evaluate and give a feedback to its authors?	1	1	1	1	1	1	1	1	1	1	10
Work with error	Does the application allow making a mistake?	0	0	0	1	1	0	0	0	1	0	3
Application score		5	4	6	7	8	3	4	4	7	4	-

Source: own

Applications for creating teaching materials - Beside the applications which are focused and specialized on teaching Biology, we have analysed another 4 applications which serve to create teaching-learning materials so that every teacher may adapt them to his subject (see the table 3). The applications allow teachers to use the programmed learning principles in an easier way than the ready applications, because it is easy to adjust their content, difficulty or form of questions. The disadvantage is that it is time-consuming investment for the teacher to create materials (Benediktová 2016). Although the applications are quite intuitive, it is necessary for teacher to be able to work with them.

Representation of the programmed learning principles in the tested applications is shown in the table below. All the 4 analysed apps allow teachers to create material which fulfils the principle of active responding. There are many forms of questions, which expect some reaction from pupils. From classic test questions, where the Socrative application works with a multiple correct answer, over matching the terms, assigning the labels in a picture (iBooks Author, Stick Around) to the questions with free answer, which must be typed on a keyboard by the pupil. The principle of reinforcement, i.e. a feedback, can be found at all the applications too. Yet its form is different. While the Socrative and Quizlet app informs the pupil on his results of the respond immediately, iBooks Author or Stick Around provides a feedback after all the

activity is completed. A teacher may even add explanation to the answer in the Socrative application. The principle of small steps which means the division of learning materials in adequate units depends in cases like that on the teacher. If the teacher follows the principles of programmed learning while creating materials, he will have no problem to meet this rule. It also applies to all applications listed in the table that it is possible to work with learning material during several activities. The best for showing the principle of small steps is Quizlet app. There at first, the pupil may practice learning materials via flashcards, turning virtual cards, where one side contents a question and the other side has an answer, then he can write in the correct answer. Finally, to strengthen learning material there is so called match mode, where the pupil matches questions to answers in time so he can compete with his classmates. The principle of self-pacing is followed too as the applications do not work in time but the pupil has plenty of time to answer, except some of the modes in the app Quizlet. On the opposite, these modes use time measuring like a motivation. The fifth principle, the principle of evaluation and program revision, including the possibility to give a feedback to authors of the application is also represented in all the analysed applications. Interesting differences were noticed during analysis of work with errors. Two tested applications work with errors. Quizlet uses the errors to benefit very well when it sends the questions with wrong answers back between the not answered questions so the pupil has to answer it again. If the answer is wrong again, the principle repeats, as mentioned above.

TABLE 3. PROGRAMMED LEARNING PRINCIPLES AND THEIR REPRESENTATION IN APPLICATIONS FOR CREATING TEACHING MATERIALS

Principles	**Question**	Quizlet	Socrative	iBook Author	Stick Around	**Σ Principles**
Principle of active responding	Does the application require active approach of the pupil?	1	1	1	1	4
Principle of reinforcement	Does the pupil get a feedback during the work with the application?	1	1	1	1	4
Principle of reinforcement	Does the pupil get any explanation within the given feedback?	0	1	0	0	1
Principle of small steps	Is the application divided in the adequate steps?	1	1	1	1	4
Principle of small steps	Does the application allow more than just one activity?	1	1	1	1	4
Principle of self-pacing	May the pupil set up a level of difficulty in the application?	0	0	0	0	0
Principle of self-pacing	May the pupil work with the application independently?	1	1	1	1	4
Principle of evaluation and program revision	Does the application offer a possibility to evaluate and give a feedback to its authors?	1	1	1	1	4
Work with error	Does the application allow making a mistake?	1	0	0	1	2
Application score		7	1	6	7	-

Source: own

Discussion

If we look at overall results of the research from the point of the individual principles, we will get a comparison of the original version of the individual principles and the existing version, which was found in the analysed application (see the table 4).

TABLE 4. OVERVIEW OF PRESENCE OF PRINCIPLES OF PROGRAMMED LEARNING IN ANALYSED APPLICATIONS

Principles	**Question**	**How many times the principle appeared**			
		EduApps for Biology teachers		**Applications for creating teaching materials**	
		Number	Percent	Number	Percent
Principle of active responding	Does the application require active approach of the pupil?	4	100%	5	50%
Principle of reinforcement	Does the pupil get a feedback during the work with the application?	4	100%	5	50%
Principle of reinforcement	Does the pupil get any explanation within the given feedback?	1	25%	0	0%
Principle of small steps	Is the application divided in the adequate steps?	4	100%	10	100%
Principle of small steps	Does the application allow more than just one activity?	4	100%	7	70%
Principle of self-pacing	May the pupil set up a level of difficulty in the application?	0	0%	1	10%
Principle of self-pacing	May the pupil work with the application independently?	4	100%	10	100%
Principle of evaluation and program revision	Does the application offer a possibility to evaluate and give a feedback to its authors?	4	100%	10	100%
Work with error	Does the application allow making a mistake?	2	50%	3	30%

Source: own

Principle of active responding - We met the principle of active responding in the form really closed to the original concept, which means the form of tasks and questions, especially at the applications for creating teaching materials. All these apps allow creating activities in the form of teaching-learning tests. Together with fulfilling the other principles, the applications get really close to the original concept of programmed learning.

In the second surveyed category, which means EduApps for Biology, we encountered a dual approach, either quite active or on the contrary totally passive. The applications with the passive way work just on the principle of passive displaying information. They may include a certain level of interactivity, nevertheless, that would serve only to select the displayed information. Atlas ptáků (Encyclopedia of birds) may be an example of such an application. It displays selected birds together with information about them or with a record of their sounds. The applications which aim to involve pupils actively do so via activities with various game elements. Such an application is e.g. Build a Body where the pupil puts together a human body from the individual organs. The pupil is active receptor of information during all the work with the application. We have met an application close to the original principle of active steps at EduApps for Biology teachers too. For example Botany where the pupil is examined through test questions from the field of plant kingdom.

Looking at the results of the research, we can state that the principle of active responding is really reflected even in the modern applications for education, although its version often does not correspond with the original concept of programmed learning.

The principle of reinforcement - appears in the applications in both forms, as a feedback or in the form required by the original concept of programmed learning which means the immediate feedback. Based on the research results we found out that a certain form of a feedback is implemented in all the applications with active approach to the information transmission. That is a really positive result. Of course, the applications with passive approach have no feedback as there is no activity for its relation (e.g. 3D Brain).

9 of the 14 analysed applications provide a feedback immediately. It is communicated through a simple notification, a piece of information whether the answer is correct or wrong or giving additional information. The application Socrative provides a really suitable feedback when the pupil gets information on the correctness of his choice together with a short explanation immediately after answering the question.

Looking at the overall results of our research, we may see the abundant representation of the principle of reinforcement in its original form.

Principle of small steps - The original form of the principle of small steps corresponds particularly with the applications for creating teaching-learning materials. The apps for creating own materials support a range of teaching activities which extension is only up to the teacher. For example, the Quizle application practices the learning materials in various ways like matching the expressions, filling the words in or in the form of closed questions. Thus they allow taking and dividing the learning materials in more activities like the original concept of programmed learning presented.

The situation is different with the EduApps for Biology. We found out that most of the analysed applications have the extent of one or few sub-activities, focusing on a very narrow topic. 3D Brain app is for example focused only on brain building. It is not possible to say that the application would follow the principle of small steps. However, if we take the application from the point of its implementation in the lesson, the app may be considered to be one or several sub-steps according to the principle of small steps. If the application is properly implemented in other activities and learning materials, it way work according to the ideas on which the principle of small steps is built. An example may be iCell. The app is dedicated just to describing plant, animal or bacterial cells. The pupil watches each cell himself and by clicking on certain organelle, a short description is displayed.

Principle of self-pacing - In the original conception of programmed learning, working with a teaching machine, or another form of programmed learning was a whole teaching unit. In that case, the principle of

self-pacing may be met as there is no following activity directly after the work with a teaching machine. Regarding the analysed applications, working with the apps does not fill the entire teaching unit. It is more just its part.

Let's take the application Atlas ptáků as an example. The teacher gets into the situation when either he sets up a specific time for work with the app or lets pupils work in their own tempo so the pupils finish their work in different intervals. Therefore, there is no certainty that all the pupils go through all the requested learning materials. The situation may be solved by applications based on principally repetitive activities (the same activities with slightly different content), where different pupils manage different number of activities in the same period of time. Nevertheless, in such a case the pupils reach different levels of knowledge they gained. Let's give an example with the application Socrative where are similar sets of practicing questions and it is only up to the pupil how many sets he manages to go through in the given time.

At the level of working with the application, the principle of self-pacing is applied at all the applications. All of them allow the pupil to work independently. However, from the point of involving the app in the lesson we cannot be sure, in our opinion there is low probability that the principle would be met completely. If we wanted to be sure, we would have to analyse the way of using the specific apps in practice.

Principle of evaluation and program revision - The original conception of the principle of evaluation and program revision corresponds the most with the applications for creating teaching materials. Using these applications, teachers becomes at the same time creators of teaching-learning materials. Therefor they may optimize their materials according to the results their pupils achieved.

Regarding EduApps for Biology, creators and teachers are almost always different people. The feedback for creators is based on point evaluation of the application and connected comments, not on the results of pupils' work. Nevertheless, even in this case the creator can receive an adequate feedback through the evaluation provided by the teacher or directly by the pupils who also have the possibility to evaluate the app.

All-over we may say that there are preconditions for the proper functioning of the principle of evaluation and program revision. They are in the form required by the application which obviously differs from the original version and we do not work with teaching machines but with applications for education with different concept. In principle, however, the form is alike. The relationship when the creator of the Edu application gets a feedback based on the results of the work of pupils or from the teacher, who works out the results of his pupils into his own evaluation.

Error-based work - While analysing the applications, we encountered with three different approaches to work with error. In the first case, the pupil is informed that he made a mistake and alternatively he is learnt the right solution, but he does not work with the error anymore. In the second case, the pupil again learns that he made a mistake and on the top of that, the application somehow reacts to the error. A really interesting work is visible at the application Quizlet. If the pupil answers incorrect, the correct solution is displayed and the question is placed at the end of the test and the pupil will absolve it again. The questions are ordered in that way unless the pupil gives the correct answer to all of them. The third approach is in compliance with the B. F. Skinner approach to work with errors. These applications do not let pupils to make any mistake at all. Have an example in the application Build a Body. The pupil builds a human body in the app. If he intends to place an organ in a wrong place, it will not remain there and will move back into the "list" of organs.

Conclusion

Based on the research, we were able to answer the questions given in its beginning. Regarding the viability of programmed learning, the answer is clear. Although programmed learning is no more used in its original form, it still finds its place in educational theory and practice. The individual ideas and principles have been transformed into a different version, yet they are still used, especially in the area of e-learning and particularly in applications for education.

Even having the research done, it remains hard to answer the question to what extent these principles are used. The applicability of the principles of programmed learning depends namely on the nature of the Edu application and its intended use.

As expected, none of the analysed EduApps for Biology teachers meets the principle of programmed learning fully. The best correlation of the principles of programmed learning appears in the applications for creating teaching-learning materials, which allow making learning materials in compliance with the principles of programmed learning.

There are at least two principles represented in all the analysed applications. All the researched applications may fulfil the principle of self-pacing and the principle of evaluation and program revision. From the point of the principle of active responding, the applications may be divided into the applications with the active or passive involvement of the pupil, when the active approach is the prevailing one. The applications which involve the pupil actively always include a feedback and in several cases it is an immediate feedback which corresponds with the principle of reinforcement. The principle of small steps appears mostly at the applications for creating learning materials. Most of the time, educational applications for Biology have a too small extent and are too narrow specialisation so they cannot get along with the principle of small steps.

Based on our article, it is clear that the principles of programmed learning keep their place even in the modern education and their positive contribution to teaching cannot be ignored. Considering the increasing incidence of mobile devices in teaching and related increasing number of applications for education which allow working with the device in different ways, we can see a certain potential in the programmed learning principles (Rohlíková 2015).

References

Aberšek, B., Dolenc, K., Aberšek, M.K., Pisano, R., 2014. "Reflections on the relationship between cybernetic pedagogy, cognitive science & language", Pedagogika, Vol. 115, No. 3, pp. 70-87.

Becea, L., Pelin, RA., 2013. "Contributions concerning the use of computer assisted programmed learning in the theoretical training of phisical education and sports for students from the polytechnic university", Quality and efficiency in e-learning, Vol 3, pp. 33-38.

Durmuscelebi, M., 2013. "Individual learning and teacher adequacy", Energy Education Science and Technology Part B: Social and Educational Studies, 5 (1) , pp. 429-438.

Frömel, K. 1991. "Teorie programovaného učení v tělesné výchově", Státní pedagogické nakladatelství, Praha.

Gangur, M., Martinovský, V., 2012. " A new programmed learning module in lms moodle", Divai 2012: 9th international scientific conference on distance learning in applied informatics: Conference proceedings, pp. 103-109.

Gangur, M., Martinovský, V., 2013. "A programmed learning principle in Question Bank Creation", Recent Patents on Computer Science, 6 (1), pp. 14-24.

Hoskova-Mayerova, S., Rosická, Z., 2012. "Programmed learning", Procedia - Social and Behavioral Sciences, Vol. 31, pp. 782-787.

Izzet Kurbanoglu, N., Taskesenligil, Y., Sozbilir, M., 2006. "Programmed instruction revisited: A study on teaching stereochemistry", Chemistry Education Research and Practice, 7 (1) , pp. 13-21.

Kjell, B., 1998. "A tool for web-based programmed learning", Computers in Education Journal, 8 (4), pp. 29-33.

Kulič, V. (Eds.), 1966. "Programované učení jako světový problém: Výbor statí ze světové literatury", Státní pedagogické nakladatelství, Praha.

Kulič, V., 1971. "Chyba a učení: funkce chybného výkonu v učení a v jeho řízení", Státní pedagogické nakladatelství, Praha.

Liškař, Č., 1981. "Základy programovaného učení", Státní pedagogické nakladatelství, Praha.

Lugarić, L., Kostanjčar, Z., Petković, T., 2005. “Using ICT for transfer of knowledge with application in solving technical science problems“, MIPRO 2005 - 28th International Convention Proceedings: Computers in Education, Vol. 4.

Maňák, J., 1998. “Rozvoj aktivity, samostatnosti a tvořivosti žáků“, Masarykova univerzita, Brno.

Rohlíková, L., 2015. “Náměty činností s tabletem“, Učíme se s tabletem: využití mobilních technologií ve vzdělávání, Wolters Kluwer, Praha, pp. 118-173.

Skinner B.F, 1968. “The technology of teaching“, Prentice-Hall, Englewood Cliffs, N.J.

Tollingerová, D., Knězů, V., Kulič, V., 1966. “Programované učení”, Státní pedagogické nakladatelství, Praha.

Vinšálek, A., 1969. “Úvod do teorie a praxe programovaného učení”, Pedagogická fakulta v Plzni, Plzeň.

THE CREATION VIDEO - EXAMPLE OF CONSTRUCTIONISM IN THE LEARNING AND TEACHING PROCESS

DUŠAN KOSTRUB

Faculty of Education
Comenius University in Bratislava, Slovak Republic

e-mail of corresponding author: kostrub@fedu.uniba.sk

Key words: constructionism, design, the learning and teaching process, qualitative methodology, students.

Abstract: Learning problems require time (months), collaboration, creativity and learning new competencies to pass a challenge. Design thinking as constructionist learning is really the object of didactics interest.

Constructionism enables the realization of such learning process that is designed as a developed entity of elaboration of information into intelligent human thoughts, products and artifacts, which have mental (idea), manual (materialistic product/artifact) and expressive (artistic product/artifact) form. The learning and teaching process is created by the learning subjects (learners) together with the teaching subjects – they take the role of designers. Such subjects are protagonists of active elaboration of information gained from the outside and use the competence to identify and acquire relevant information, together with the competence to search for information obtained in the learning problem, learning theme/topic. Constructionism in the learning and teaching process is an activity of integration of intelligence (to deal with problems and to be creative), in which the subjects make an effort to transcribe and translate relevant information (as an important entity), into their own mental activity. It is primary about processes of transforming the known into unknown and vice versa, resulting in various versions of knowing/understanding. Thus students learn in an active and conscious way, therefore learn more than is required from the subject matter itself.

This scientific study focused on the realization of a learning and teaching process in which the goal was to create an experimentally based (by experimenting with learning materials, sources and relevant information), explicative, educating video from students for students in the content of mathematics. Inductive and participative didactics, qualitative methodology, with an appertaining design, were applied. Two different outcomes of this study could be found. From the process of making the video and from the realization of a constructionist design of the learning and teaching process. The participating subjects made up from two 5th grade classes at primary school.

Introduction

Based on the results presented in scientific papers (Kostrub 2017), this study develops the basic concept of teaching mathematics (a selected mathematics curriculum) with the support of digital technology, in which the only protagonists are 5th year elementary school students. Two principal findings (emerging within the qualitative research) are so determinative that it is necessary to focus the process of teaching mathematics on their elimination. It concerns the lower level of self-confidence of students and the loss of their assurance when they encounter unexpected difficulties in using digital technology in a mode available to them. The issue of self-confidence is paramount because it is connected with students´ emotions, which influence the quality of their learning processes. In thinking about how to design the teaching of a selected curriculum of mathematics to ensure that self-confidence is supported (and not suppressed), it was necessary to determine the factors that can be influenced by our efforts. The above mentioned scientific papers (Kostrub 2017) state that it concerns external influences resulting from setting of the teaching of other subjects, and lying in individual concepts of the teaching of colleagues who prefer transmissive models of teaching based on behavioural theories of learning.

Colleagues can change these models from the outside (e.g., based on our wishes), but (only) provided that they themselves realize that the transmissive model is not sufficient for their students and/or is ineffective or directly damaging. However, this study will not approach the topic from this aspect. The loss of students´ assurance due to encountering difficulties of an (for them) unknown character when using

digital technology is a professional challenge for our concept of teaching. We connected it with our intention to support students in their search for solutions to difficulties in using digital technology (and in coping with such situations), and we considered linking it to supporting their self-confidence. According to the inductive and participative model of teaching, it is unthinkable to act on students with a kind of training of self-confidence or ability to cope with obstacles or difficulties. On the contrary, the process of teaching is to be designed so that by a certain socio-cultural approach (by implementing free, autonomous and mainly meaningful discursive and cultural practices of students), the mentioned processes are evoked, enabling changes to be made. Within the teaching process, it seemed to be natural to engage students in activities (teaching activities) which would, by their intrinsic nature of the current world (the digital world of our students), captivate them to such a degree that they would achieve changes by applying their own inner motivation. For the students, the change was self-evident, in the sense: "We do not want to make errors, but we do not want to be afraid of them either." Concerning the support of self-confidence, the students were aware of the presence of mutual respect, acceptance and mainly interpersonal understanding. Students are not praised for desired behaviour or blamed for mistakes or a lack of attention; on the contrary, they are invited to become and be equal partners – colleagues like adults at work. The students are connected by the subject of their cooperation and by the result they want to achieve. This teaching method encourages collaborative learning; students take roles and perform them (which is typical for collaborative cultures); they do activities, discuss activities, search for common ground and apply their own skills. It is a conglomerate of skills in three frameworks (defined, e.g. by F. Frabboni 2001), such as: (1) the framework of verbal communicative means, (2) the framework of non-verbal communicative means, and (3) the scientific and environmental framework.

Constructionism allows for the teaching process as a design in which the developed entity elaborates information into the shape of intelligent human thoughts, products and artefacts that have intellectual (an idea), manual (a material product/artefact) as well as expressive (an art product/artefact) forms. The design of the teaching process is created by the learning subjects together with the teaching subjects – they are in the roles of designers. These subjects are the protagonists of the active elaboration of information obtained from outside, and they use their skills to distinguish and obtain relevant information while searching for information related to the learning problem and/or learning topic. Experimentation with selected mathematical curricula in combination with manipulation activities allows the involved subjects to change the perspective of viewing the curriculum – to see (understand) it in other contexts. The framework concept of teaching and its activities was considered based on recommendations from J. Raths (1971 In Sacristán & Péerez Gómez 2008). Constructionism in the teaching process is an activity of intelligence (to solve problems and issues, and to succeed in coping with them), where the subjects try to transcribe and translate relevant information (as an important entity) in their own intellectual activities based on the

implementation of thematically interconnected discursive and cultural practices. It mainly concerns the processes of transforming the known into the unknown, and the unknown into the known. This results in various versions of cognition. In this way, the students actively and consciously learn (and retain) more than required by the subject of mathematics. This study is focused on the implementation of teaching whose goal was to create, by experimenting with teaching materials (linked to the curriculum of mathematics), teaching sources, relevant information, and an explicative educational video by students and for students. Inductive and participative instruction and a qualitative methodology with a corresponding design were applied. *The results are threefold; the results related to the creation of the video, the results related to the constructionist design of teaching, and the results related to the students.* Of course, the results of the study described herein could also be linked to the teacher, but since the mentioned teacher is a researcher cooperating with the author of this scientific study, and in terms of methodology, it is action research.

The didactic reality is jointly and mutually created by the teacher together with the children, students and participants, from which it follows that the interpretation of didactic reality is created by these subjects based on their social construction of its representation. Therefore, it is given due attention by the researcher.

To think about the process of teaching is:

1. a question of importance – What importance do I, as a subject, give to the process of teaching? What importance do the other subjects of teaching give to the process of teaching? Is there a semantic agreement between the other subjects of teaching and me and between the other subjects and each other? Which interpretations of the importance of teaching process can be agreed on and which interpretations are impossible to agree on and why? The research question is linked to finding an answer to at least two determinative sub-questions: (a) Is the interpretation of the didactic reality of the teaching process important because the considered reality refers to and influences the concerned subjects? And (b) Is the interpretation of the didactic reality of the teaching process important because it presents (indicates) or reveals something (un)typical or (un)specific in connection with the steady behaviour of the subjects in the teaching process?

2. a question of conceptualization – Which terms related to the importance of the teaching process allow development and a more detailed specification of abstracting thoughts (integration of knowledge into higher and newer units based on the creation of systems, terms and their relations under the influence of the preferred values) and why? Which concepts and conceptions enter into the interpretation of the meaning/meanings of the teaching process? Do concepts and conceptions of the interpretation of the teaching process require a change, and under which perspective should such change take place? It concerns

the engagement of the dialectic process of "picking up", understanding and interpreting reality in which the experienced, the implemented and the realized allow for the configuring of the form of thinking that connects the subject with real questions, topics and issues of understanding the teaching process. It is also a question of critical thinking (in particular, methodological reasoning). Critical opinions form the precondition of the research (action) transformation of the teaching process to ensure that the vital practice of cultural and discursive practices of the teaching process can be re-dimensioned (repeatedly dimensioned). It refers to focusing on concepts (conceptions) that best describe the studied phenomenon.

3. a question of research – What seems to be necessary to be studied in the teaching process – why should it be studied by research? What specifically starts to emerge (appear) in studying the teaching process and why? Is it necessary to apply practical exploration (What needs to be understood?) or critical exploration (What needs to be justifiably changed?)? Why formulate and identify the existing problems (their profile, extent, impact on the structures of the teaching process etc.) which emerge? Various contrasts that are actually present and methodologically handled may help teachers (children, pupils, students etc.) emphasize new, different functions, elements, factors of the teaching process that might have escaped their attention before the study (and/or were not in the centre of their interest or were too distant for them – they did not concern them) (and now they have appeared and/or emerged), and identify and verify which functions, elements, entities and factors of the teaching process are relevant (or irrelevant) for their new concept of cognition and interpretation of the importance of the teaching process. The study shall help understand the problem and learn about the opinions of the subjects, describe the functionality of the studied phenomena in relation to the system (specific, not general connections) and outline a new explication theory and/or give rise to change.

The central idea is that the one who turns on the educational video should know what it is all about; how to proceed, in the case of the self- and autonomous measurement of subjects, without errors and mistakes in line with information given by the video-recording. The idea of constructionism "from you, through us, for you (the others)" means that the students have to first obtain relevant information from external sources, and adjust the information to their own learning intentions, which is not unambiguous, as the information is part of a certain information murmur. The students had to take a critical standpoint on the information they selected so that it could be usable by them. The elaboration of information also requires achieving a compromise with reality. After elaborating the information and using intellectual as well as social representations, the students search for, study and verify the truth of their arguments, but in particular, they make experiments with the selected mathematical curriculum. Even though (from their point of view) they are playing, in fact they are creating an educational video, more precisely a video in which they have to harmonize several important aspects that have a significant impact on the final product. The inspiration for how to do it (the know-how) is not learnable; what is learnable is the content of the

curriculum, the techniques and technology, but the inspirations are a result of the level of creative thinking in connection with creative competencies. The creation of a learning environment takes place as a result of the collaboration of the teacher and the students, but the creation of the video is a matter of the students themselves. The students create the educational video by which they present other students with certain types of problems related to the curriculum addressed by the video. This process includes abstraction, the student´s conception and consideration of the applicability of the sophisticated processing of the topic of the educational video. The students must consider the audience for whom the educational video can be a benefit. It means that they must coordinate several points of view and be able to put themselves in the place of the other students and their way of thinking, while the education needs are taken into account too.

Design studio, or "from you, through us, for you (the others)"

The creation of an educational video is an idea whose aim is to connect the learning preconditions of students with the selected mathematical curriculum and their own learning (development) potential. By applying inductive and participative teaching, a group of students becomes a learning group which (after taking the roles by particular entities), can represent a design studio in terms of symbolism. The students´ activities in the design studio represent cultural and discursive practices corresponding to a real design studio. The roles have an important task (and a substitutive function) in the implementation of cultural and discursive practices. As T. S. Popkewitz (2009, 138) states, the teaching process is a social construct of reality because it deals with the areas of cultural practices and applying content; collaboration means the performance of jointly and mutually shared decisions. Each actor has unique experiences and points of view that are discussed by means of collaboration practice. J. G. Sacristán, et al. (2008, 73) states that learning is fundamentally a by-product of the participation of individuals in social practices by which they become members of a social community. By taking the roles of developers, the students transposed their actions into the corresponding professional area. This was one of the assumptions for thinking and acting in the previously mentioned representative dimension. Mathematical knowledge must be actively construed; it cannot be passed on by the teacher, presented by a textbook, or forced by a workbook/worksheet at the time and just at that time when its understanding by the students themselves is expected. The students (the subjects of our research) implemented processes of the social construction of mathematical cognition based on the principles of comprehensibility, social acceptability (with the teacher´s support of the processes of cross-checking of correctness), and interest – attractiveness. We also bore in mind the support of self-confidence (e.g., self-affirmation, self-assurance, self-trust) (for more information see: D. Kostrub 2017, 103-124), which also needs to be externally enforced in the school context (as we determined by our research). It is not easy for a teacher to know how to support the self-confidence of a student. We provided students with opportunities (with the help of learning scaffoldings) to be important and beneficial for the other subjects, which means, among others, being responsible and

learning to see the world through the eyes of the others – placing oneself in the point of view of the others (interaction of minds).

As mentioned by S. Papert & I. Harel (1991), constructionism means learning based on a design, actions and constructing projects with use-specific materials and means (e.g., a computer, words, videos, media, etc.) via social collaboration and the social construction of knowledge indicated by the idea that "You can learn by performing activities (by making things), or even better, by speaking about what you are performing (doing)." The task of the teacher is to be aware of the plurality of teaching possibilities and environments that support and multiply them.

The students used conventional items (measuring instruments such as a rulers or measuring tape) as well as unconventional items (body parts, a cord or pieces of paper) to measure objects, whereby in the case of unconventional measuring, it was necessary to make some considerations outside the framework of common convention, which posed no problem to the students. The students defined their own unit of length (e.g., the dimension of a radiator, a mobile phone or a threshold, etc.) and using such length, they compared (determined) how many times the circumference selected by them is contained in the given length. The starting point was the teacher's proposal (an intellectual challenge) to draw a plane figure and then to measure its circumference and content. From this moment on, the teacher as well as the researcher were interested in the strategies developed by the students in such a "teaching" situation. The strategy of an open and direct approach prevailed. The students most often took a piece of cord, which they placed tightly along the circumference of their plane figure, and measured its length. They realized that when it concerned a direct line it was a unit of length. In measuring content, the students preferred a square grid they drew in their picture (the plane figure) and determined how many squares were contained therein. Some students determined the number of complete squares, while other students considered the partial squares, and others decided for rectangles with which they filled up their plane figure.

Education of Geomety using a constructivist approach and manipulative techniques and digital technologies lead to greater motivation of the students for the given topic, as well as to activating higher cognitive functions (Korenova 2017).

We obtained a large number of video-recordings that will be sorted out based on agreed criteria so that incomplete and unusable video-recordings will be excluded. The sorted-out video-recordings will be edited and modified for educational needs (an oral commentary will be added) and distributed to other users. The first video-recordings will be publicly analysed in a group to eliminate any errors and shortcomings in terms of content. Furthermore, a basic and usable list of criteria for creating videos will be drafted to prevent errors and deficiencies, which is necessary, because the students should be fully aware of them. Also, these activities related to the assessment and evaluation of video-recordings will be recorded. In this

way, a kind of specimen will be created showing the students how to think and act. It is important for us to identify conceptual schemes, and intellectual and social representations of students including their considerations on the selected mathematical curriculum and on the method of experimenting with them. Watching the sequences of the video together and commenting on it will enable the viewers to identify the misconceptions of students within an argumentation dialogue as part of teaching. Cognition is created together and mutually in the discourse (in a discussion commonly controlled and supported by the teacher) where narration plays an important role. The mutual interaction of the minds of involved subjects is inherent. This video-recording will also be used. A monothematic educational video will be created from among the selected video-recordings (and their discourse and evaluation sequences), containing a thematic unit of the selected curriculum with the accompanying students´ commentary, in which our aim is to ensure that the commentary is presented in the students´ language, with clear and correct pronunciation, and mathematical precision. We believe that an educational activity is of greater value when it connects the learners with reality: by touching, handling, applying, testing and selecting materials and objects. The teaching scaffoldings are based on collaboration, a global point of view (a perspective), coordination, communication and controlled participation. They are also based on the provision of corresponding conditions and circumstances to ensure that the learning subjects know how to get to the bottom of something which is still new to them, and to do something that they find to be still invincible for them. By means of the education scaffoldings, the learner can be helped so that the learning subject (subjects) first does (do) not solve the problem alone, but with the reasonable support of others (his/her peers, a teacher). Once the learning subject obtains the required cognitive tools, and the available and usable cognitive devices, and activates the required skills, external help becomes superfluous, in terms of didactic aspects, because the learning subject can continue on his/her own, and rely on his/her own potential (auto-regulation).

Results of the current stage of the research

1. Video creation: The students decide on the design and concept of the educational video because they feel committed to creating an educational video that will be valuable and instructive, but mainly they are fully aware of its impact on the target group. They know that as the creators they are responsible for it, and they divide their responsibility into the application of democratic principles, the protection of intellectual property and the quality of their product.

2. The constructionist design of teaching involves constructionism, design, architecture. It is a conceptual art shared jointly and mutually by the students and their teachers as a result of the discursive and narrative essence of teaching in which they make proposals, discuss, describe, present, approve, evaluate, judge, agree, create and rework the non-material form of their products into a material form and vice versa. This takes place in the form of intentional but indirect student and teacher participation in

teaching activities, controlled by the teacher, in which, however, the teacher acts as a consultant when he/she is invited by the students to comment on their ideas, while avoiding any reference to mistakes. Constructionist teaching takes place through didactically considered but conceptually open teaching activities, and through discourse (controlled argumentation, handling facts) in the form of individual as well as group exploration (learning groups), thanks to which common knowledge and understanding is established.

3. The students are authentic and complete (their whole personality is involved). The students apply corresponding cognitive tools, such as thinking and speech in connection with the cognitive prostheses available in their surroundings. Their minds are thus formed in a different way, which means that digital technology delimits and structures cognitive schemes in a way that was unfamiliar to students of previous decades. The confidence arising from the availability of conventional information is pertinent; nevertheless, on the basis of such information, a conceptually reflective teacher supports the formation of unconventional knowledge which can be used for other teaching contexts. The students are able to perform both specific and unspecific transfers, which is a precondition for the teacher to lead the teaching process on the basis of the principles of constructionism. The students communicate because they want to know and understand. The students create and re-create because they are inspired and fulfilled by the procedural aspect of the transformation of the known into the unknown and vice versa. Moreover, they focus on the product and during the creation of it they transform their intellectual plans and designs and simultaneously outline not only the rules but also the criteria influencing their creation, assessment and evaluation of their final product.

The research described herein took place based on the principles of qualitative methodology, which means that the findings were generated from the point of view of its subjects.

References

Korenova, L. 2015. “What to use for mathematics in high school: PC, tablet or graphing calculator?”, The International Journal for Technology in Mathematics Education, 22(2), pp. 59-65.

Koreňová, L. 2015. Digitálne technológie v školskej matematike. Bratislava: KEC FMFI Univerzita Komenského.

Korenova, L. 2017. “Symmetry in elementary education with the use of digital technologies and manipulations”. In APLIMAT: 16th Conference on Applied Mathematics. Bratislava, Spektrum, pp. 836–845.

Kostrub, D. 2016. Základy kvalitatívnej metodológie: keď interpretované významy znamenajú viac ako vysoké čísla. Bratislava: Univerzita Komenského.

Kostrub, D. 2017. “3x meraj, potom rež, len si žiakov neporež!. Interpretatívne skúmanie of výučby matematiky – Look Before You Leap, Just Don´t Jump On Your Students Interpretative Examination of Teaching Mathematics“. Pedagogická revue. r. 64, č. 1. pp. 103-124.

Osaďan, R. & Reid, E. 2016. “Recent migrants and education in the European Union”. Compare journal of comparative and international education 46 (4) , pp. 666-669

Papert, S. & Harel, I. 1991. Constructionism. New York: Ablex Publishing Corporation.

Popkewitz, T. S. 2009. El cosmopolitismo y la era de la reforma escolar. La ciencia, la educación y la constrcción de la sociedad mediante la construcción de la infancia. Madrid: Ediciones Morata.

Sacristán, J. G. & Gómez Pérez, A. 2008. Comprender y transformar la enseñanza. Madrid: Morata.

Open Access

ENHANCING KNOWLEDGE SOCIETY CONCEPT VIA EDUCATIONAL PROJECTS

OKSANA ZAMORA

Economics and Management Faculty,
Sumy State University, Ukraine

TETIANA KHVOROST
Engineering Technologies Faculty,
Sumy National Agrarian University, Ukraine

NATALIA KLIETSOVA
Law Faculty,
Sumy National Agrarian University, Ukraine

e-mail of corresponding author:pantomime@ukr.net

Key words: Knowledge society, prosumer, open education, MOODLE, e-learning.

Abstract: The research goal was to understand the importance of a coordinated response to the challenges aroused from offering educational services to foreign citizens and adults by Ukrainian universities. The paper presents the experiences on how the information and communication technologies may be used in addressing challenges of modern society while changing the teaching approaches.

Given Internet and informational-communication technologies role in effective building of the inclusive knowledge society the paper presents the overview of three case studies observed during a 4-7 years period at the basis of Sumy National Agrarian University: peer-design of the education courses and MOODLE use for distance learning of foreign students (15 courses, 80 students), and rural citizens (386 farmers) education via Internet. The conclusions were delivered under the context of explored issues, challenges and opportunities of the knowledge society, open education and lifelong learning concepts. The paper highlights the importance of identifying good practices in specific areas of youth and adult education within the educational projects under the increasing foreign students flow into the country and rapidly rising number of rural unemployed.

The researches outline the pressing need for collaboration in educational content development via engagement of not only peers but also learners in order to avoid a widening gap between educational institutions/scientists and individual learners. The need for development of adults' digital skills is increasingly becoming a key for implementation of the lifelong learning concept in Ukraine, and was also addressed in the paper. The validated framework, tools and methodology of the informational-communication technologies use should provide a structured approach to the educational content development within the current Ukrainian educational system. The results of the paper try to generalize the best approaches to reach the aforementioned goals which may be further used by universities working in the same field.

Introduction

The teachers' team consisting of the authors of the paper was among the first teaching staff of the Sumy National Agrarian University (Ukraine) who started working with foreign students in English and who was also involved in the MOODLE on-line courses development. The number of foreign students (mostly coming from African and Asian countries) has been constantly increasing since 2010, while due to the visa issues they couldn't start to participate in the educational process in time: some of them arrived 2 months later the academic year beginning. The university educational project aimed at engagement of the MOODLE platform into on-line courses design set the problem of development the content which would have been easily grasped by the foreign learners. This brought out the need to investigate the comprehensiveness of the open education and digital tools use within the educational process at the university.

A number of empirical observations made us to consider the effectiveness of an educational course design done by a single teacher, because, as the experience showed, the courses content delivered to a Ukrainian group of students and to a mixed one (or up to 100% consisting of foreign students) is expected

to be up to 50% different. This refers to several defining and significant factors: educational and cultural background, cognitive skills, teaching approaches used by previous teachers, places of future knowledge application (both in geographical and management-practice sense), personal motivation, teacher's and students' ability/experience of teamwork under the intercultural context, etc.

The need to teach foreign citizens in English and absolute lack of English-language literature available in Ukraine also pushed us to use as many Internet open access resources as possible. This brought up to the surface a number of issues to be learnt and solved: starting from intellectual property rights and finishing with technical implementation of the ICT tools into the educational process considering the lack of PC equipped classes, speed of the Internet, teachers' and students skills in ICT use, their motivation to do so, etc.

Additionally, during the FAO/EBRD educational project* implementation during 2014-2016 the researches team had to deal with the representatives of the farming sector of seven regions of Ukraine teaching them directly or on-line. This allowed to observe the empirical data of the MOODLE/Internet use by the farmers, representing both the adult education and the rural citizens segment. The summarized and generalized conclusions of the 5 years' experience in the topic are presented in the paper along with the processed theoretical implications which are currently discussed within the scientific community.

The research paper goal is to understand the importance of a coordinated response to the challenges resulted from offering educational services to foreign citizens and adults by Ukrainian universities. The paper presents the experiences on how the information and communication technologies may be used in addressing challenges of modern society while changing the teaching approaches. The research results may be used by the relevant universities which undergo the same transformation process on their way to the full knowledge society members.

In regards to the computer mediated information delivery, it is important to consider the cognitive load theory which was used by R. Mayer for his further developments of an e-learning concept. This theory (Alan Baddeley and Graham Hitch 1974) discloses that "working memory has two largely independent, limited capacity sub-components that tend to work in parallel – one visual and one verbal/acoustic". This principle is laid in basics of the further text-based digitalization of the educational process.

It is well-known that traditionally this process was built upon oral communications between teachers and learners which didn't provide time to reflect on the material delivered. The speech of the instructor may be also badly structured and specifically sounding, not all the students are capable to fix the necessary key points, etc. D. Garrison and colleagues (2000, 90) considered computer conferencing as one of very

*The two stages project "Successful Grain Agribusiness in a Small Area", which had been implemented in 2014-2016 with the support of "Central European Initiative" in partnership with Sumy National Agrarian University.

promising teaching tools and even offered the Community of Inquiry theoretical framework to describe advantages of the collaborative-constructivist learning activities during online discussion forums. This framework leads the process of learning experience through the development of three elements – social, cognitive and teaching presence. Lipman (1991) enlists the following characteristics of the Community of Inquiry: "questioning, reasoning, connecting, deliberating, challenging, and developing problem-solving techniques".

Nowadays the use of digitalized communication is becoming increasingly adopted by the higher education institutions all over the world. Many leading universities are looking at a computer-mediated communication with their learners as at something that is worth to invest in because it is a "versatile medium for the delivery of educational programs "anytime, anywhere" (D. Garrison and colleagues 2000, 87). This lays in line with the global trends of countries integration, migration for work and studies and, what is more important, with a philosophy introduced by the EU experiences and fixed in the Sustainable Development Goals of the UN 2030 Agenda for Sustainable Development (the UNO 2015).

This philosophy was expressed also by Wim Van Petegem (2009), the associate professor of the Katholieke Universiteit Leuven. He sees lifelong learning as an attitude which requires training of relevant skills. This statement is very important for us while considering the attitudes to studies of the rural citizens in Ukraine and the skills they possess. Of course, both are mostly limited by the initial poor educational background and available scarce resources forming decadent mind-set, namely that's why the vision of W. Petegem that "lifelong learning is a personal combination of formal, non-formal and informal learning, with individual and collaborative activities" adds significant value to our recommendation to change the governmental approaches in the educational system of Ukraine.

Still, with this paper we will outline the pressing need for collaboration in educational content development via engagement of not only peers but also learners in order to avoid a widening gap between educational institutions/scientists and individual learners. The modern knowledge shouldn't belong to the closed circle of "magicians" as it was in ancient times. Information and knowledge is power but not for the world to be ruled by a limited number of people. It is a power for enriching each individual, guaranteeing societal safety and prosperity. The input of a real sector of economics into educational programs development means a lot for their learning outcomes future applicability and efficiency of their graduates at work.

We also need to study the necessity for development of adults' digital skills which nowadays increasingly become a key for implementation of the lifelong learning concept in Ukraine. The validated framework, tools and methodology of the informational-communication technologies use should be

outlined and will provide a structured approach to the educational content development within the current Ukrainian educational system.

Why the IT Skills for All Is Still a Subject of Discussion in Ukraine?

Apart from Ukraine, which follows the current world trends with a 10-20 years gap, the European Commission issued a new Skills Agenda for Europe in 2016. This document promotes all kinds of actions "to ensure that the right training, the right skills and the right support is available to people in the EU so that they are equipped with skills that are needed in a modern working environment, including the promotion of digital skills" (EUROSTAT 2017). In fact, European Commission has recognised and has been supporting these developments for decades already. Strategic Framework for education and Training ("ET 2020") stresses on innovation enhancement through the use of ICT tools and along with the Digital Single Market Strategy contributes to the strengthening of the digital economy and society. Access to the Internet and open education development are seen to be essential for the development of e-government, e-business and e-learning. Ukraine, as any other post-USSR country, strongly lacks similar comprehensive approaches. Open educational resources are still considered to be of low trust and are rarely used in the educational process, while collaborative approach to knowledge creation is an absolutely new tool, still to be commonly accepted.

The difference in e-learning perception by the EU and post-USSR countries is vividly seen by the following example: Merriam-Webster's Dictionary, America's leading and one of the most-trusted providers of language information for English learners in post-USSR countries don't offer the definition for the e-learning term at all. This is a traditional approach to the language data base formation which lacks flexibility and necessary timely resources of a whole volunteers' community. While a free online encyclopaedia "Wikipedia" gives it with references to Richard E. Mayer, the founder of the e-learning theory, as a "cognitive science principles of effective multimedia learning using electronic educational technology". Wikipedia is an Open Educational Resource that can be modified and enhanced by the volunteers from around the world. This unique feature of the OERs allows free access for everyone to the information which once required special conditions of access and more complicated rules of reuse, translation and modification. Still, even though post-USSR countries enjoy the benefits of such resources they are not considered to be of scientific or teaching value for the schools and universities. D. Amemado notes this tendency even for the European universities which "do not adopt technologies primarily for pedagogical or teaching and learning task-related reasons" (Amemado 2014, 28). ICTs are rather used as an additional enriching tool which may be used by a learner's choice and will.

Modern Computer-based Educational Philosophy of Prosumers and Ukrainian Realities

Modern world educational philosophy, proved by practices, states that in the country that tends to be successfully developing, everyone should have access to high-quality education (free of charge, at low or high prices – depends on a state policy choice), its resources (including infrastructure) and the related opportunities (to apply the knowledge and competences in exchange to decent rewarding). Of course, there may be such barriers as learner's lack of finance, physical distance, difficulties in understanding, out-dated materials, etc. But namely these issues are offered to be solved by the use of OERs which allows the learner to enhance his/her knowledge and skills despite the barriers.

For example, Open Education Europa's Resources page counts a large collection of resources in the 24 European languages and at all educational levels, and there are lots of such data bases more. Massive open online courses (MOOCs), accessible to anyone with a computer and access to the Internet, allow enrolment of a significantly bigger number of students than it is possible for the traditional educational institutions. There are researches that call the MOOCs "to be an online crossroad where to learn from other areas of studies and from professionals and scholars of different backgrounds" (Amemado and Manca 2017, 22). They also stress that learning activity is currently "distributed across people, environments and situations" (Amemado and Manca, 2017, 25). It means that roles of the learners' or instructors' are exchanged sometimes and subjective human knowledge assessment is eliminated by automatic grading.

It is interesting to note that we are describing the trends that exist now, but were caused by the development of digital technologies and information society transformation, while in 1980 an American futurologist Alvin Toffler had already offered a term "prosumer" in his "The Third Wave" book. He referred to a person who consumes and produces media at the same time. Nowadays this term describes either online buyers or, in line with a new educational philosophy, learners who are involved in the development process of educational resources. The university students, graduates, adult learners received an opportunity to use more personalized teaching materials adjusted to their needs – either cognitive or professional, cultural or financial. And thus, involvement of the learners raises the material value, while educators may further use, share, and modify those materials, significantly multiplying the learning effect.

According to A. Peters and G. Britez "Openness is a concept that has come to characterize knowledge and communication systems, epistemologies, society and politics, institutions or organizations, and individual personalities" (Peters and Britez 2008, 3). It means that downloading someone's case study, adapting it to your students' needs and re-uploading a new version back on-line is not a crime but an act of creation the added value for the educators community. Commenting on possible adjustments and asking for more diversified/applicable examples or tasks is not a preference of a good student-teacher relationship any more, but rather an interesting challenge affordable by any stakeholder. Still, even though there are no

borders in the Internet or, sometimes, watermarks on the documents or pictures, the original content is a subject to national copyright laws. As it is open for use, it may be remixed or repurposed, but even then it is under the ethics and integrity rules of the society. Facing these challenges is a difficulty for the Ukrainian society as well, as for any other post-USSR country too. Legislation bottlenecks are accompanied by the low awareness on the issue or simply lack of mental readiness for the IPR responsibility.

All in all, the effects of the OERs and ICT tools on the quality of the learning process, its final outcomes, future learners' perception of the studies and, what is more interesting, of the author-produced knowledge have not been well studied yet because, as for any social and cultural process, it may take decades to see the results.

As for the "knowledge society" term, it was introduced by Peter Drucker in the late 1960s and developed by Robin Mansell and Nico Stehr 30 years later, being recognised by all the OECD members, emerging economies and even developing countries nowadays. The UNESCO world report 2005 "Towards Knowledge Societies" outlined the need of further transformation of the knowledge society onto a knowledge-sharing base, stating: "… for access to useful, relevant knowledge is more than simply a matter of infrastructure – it depends on training, cognitive skills and regulatory frameworks geared towards access to contents" (UNESCO 2005, 21). The issue of the content quality and accessibility motivated this research paper creation.

Research Methods and Background

The research question was inspired by the experience of the researchers' team in dealing with the creation of the university curriculum for foreign students and adults, as well as with participating in the professional and career development competences of a university teacher. Being an executive of the educational projects with the use of on-line resource enriched the researches team experience and observations data. The research question was to understand the importance of a coordinated response to the challenges resulted from offering educational services to foreign citizens and adults by Ukrainian universities.

By using MOODLE feedback analysis we obtained the results of on-line education potential for foreign students and for adults coming from the narrow professional field and being the rural residents (farmers). By means of the questionnaires and face-to-face communication we asked the users of our educational programmes about the challenges they faced during accessing the on-line learning and during the studying process itself. Our personal observations during 7 years of teaching foreign citizens (up to 15 students each year per each member of the research team, 80 students in whole both in bachelor and master studies) and 5 years of the educational projects implementation (15 on-line courses in English and 2 on-line courses for farmers) gave us the opportunity to present the experiences on how the information and communication

technologies may be used in addressing challenges of modern society while changing the teaching approaches. The number of farmers who were involved in the FAO/EBRD specialized training program "Successful Agribusiness Grain in a Small Area" was 220 (6 modules) in 2014-2015 and 166 (4 modules) in 2015-2016.

The conclusions were delivered under the context of explored theoretical issues, challenges and opportunities of the knowledge society, open education and lifelong learning concepts.

Observation and Analysis of Results: Ukraine Comparing to the EU

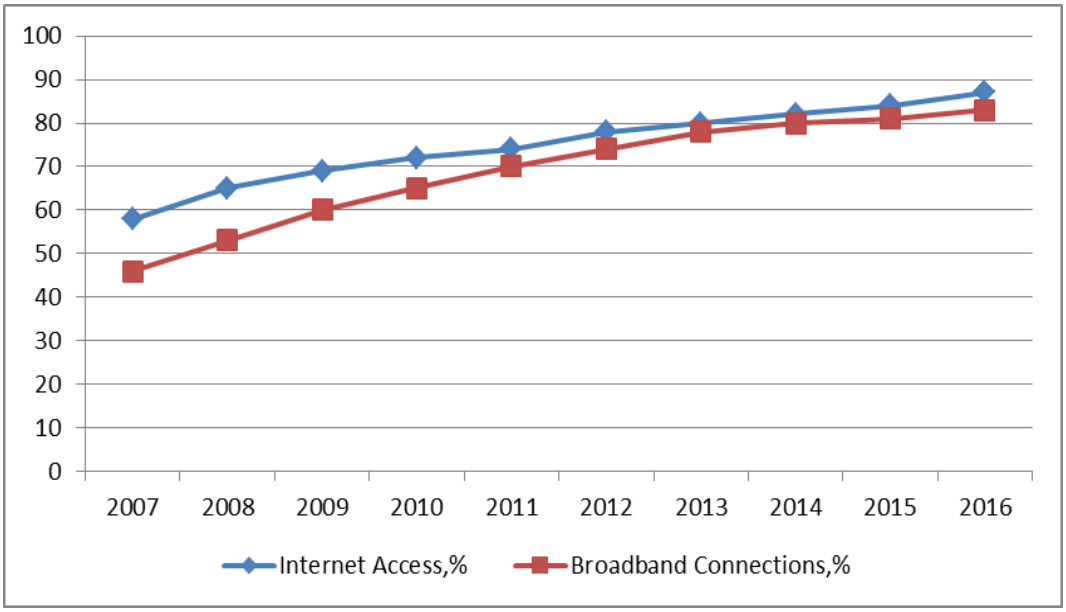
The major findings of the study are based on the analysis of the European and Ukrainian experiences in enhancing the knowledge society via open education and ICT tools development. Thus, according to the Deloitte Limited EU Funding guide (2014, 5-7) the main EU funding programmes of the 2014-2020 period are: "Horizon 2020" with a total budget of €77,03 billion, "Connecting Europe Facility" with €21,94 billion and "Erasmus+" with €14,8 billion. Apart from those there are also other funding programmes for education in particular (Consumer Programme 2014-2020, Customs 2020, Fiscalis 2020, Hercule III, Internal Security Fund Component for Police Cooperation, Pericles 2020) and separately there are those aimed at the ICT development (Ambient Assisted Living Joint Technologies Programme (AAL JP), Competitiveness of Enterprises and SMEs (COSME), Fiscalis 2020, Galileo, Egnos, Horizon 2020). These statistical data show the level of financial support provided for the innovations and ICT development, as well as for education in Europe. While, according to the official Ministry of Education and Science report, there is one computer per 27 students in state schools in Ukraine. 87% of schools have the Internet access, 96% of schools are equipped with some amount of the hardware (40% of it is old-fashioned) and software (13% of it are used without an official license). And the last emotional piece: 360 thousand teachers have been trained in the last 15 years. The Ministry of Education has just proposed to amend the Resolution of the Government (No. 65 dated 01.03.2014), which will allow to edit the state targeted programs in the field of ICT in education and procurement of modern computer equipment, equipment and software by educational institutions (Derevianenko 2016).

The insufficient infrastructure (number of computers, low Internet speed, relatively high costs for ICT skills training, mobile Internet traffic, Internet accessibility in rural and remote districts), low awareness in ICT potential for daily life and in applicable opportunities for advanced computer skills, weak state policy for digital society development and innovations support – all these and much more results in low computer skills and low efficiency of use of digital resources in Ukraine. Affordable and widespread broadband Internet access is very important for a knowledge-based society enhancement.

According to EUROSTAT (2017), 83 % of the households in the EU-28 had broadband access to the Internet in 2016 (see Graph 1), apart from the Ukrainian state-of-the-art (see Graph 2), which is 62% of citizens older than 15 (Factum Group Ukraine report 2016). 97 % of such EU users were recorded in

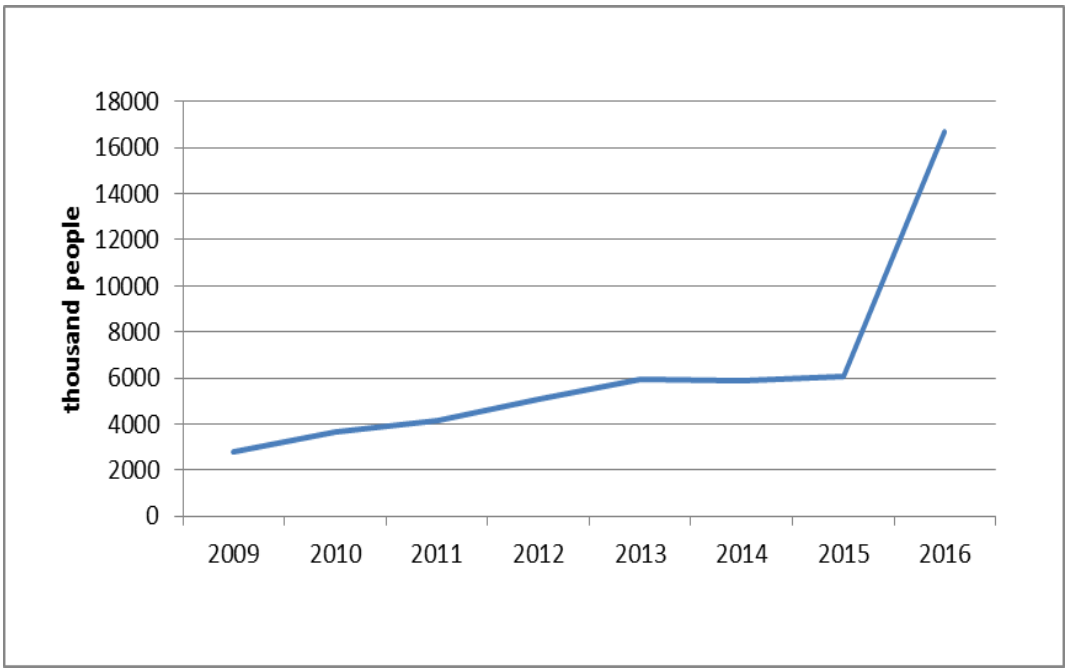
Luxembourg and in the Netherlands, while the lowest rate of 64 % households with internet access was observed in Bulgaria. More than 82 % of all EU citizens starting from the age of 16 used the Internet at least once in three months, 71% of whom accessed it on a daily basis.

GRAPH 1. INTERNET ACCESS AND BROADBAND INTERNET CONNECTIONS OF HOUSEHOLDS, EU-28, 2007–2016 (% OF ALL HOUSEHOLDS)



Source: EUROSTAT, 2017.

GRAPH 2. NUMBER OF INTERNET USERS IN UKRAINE, 2009-2016, THOUSAND PEOPLE



Source: State service of statistics of Ukraine, 2016.

It should be noted that similar to Ukraine, there is an urban-rural division within the EU-28 in terms of internet access. 86-88 % households in cities/towns have comparatively high access rates, while in rural areas their share is 80 %. The improving situation in Ukraine with those numbers doesn't mean the

improvement in computer skills for the rural population though. Almost 47% of rural households and 69% of urban ones have the Internet access (Factum Group Ukraine 2016).

It is important to note that in the EU-27 women and men shares in the number of those who participated in education and training in the 12 months before the interview were equal. According to the official statistics, men were sensibly more likely to get new knowledge in the Netherlands and Germany, while the reverse was observed in Finland, Lithuania and Latvia. It's a common sense that in 2011 the data showed, that younger persons (aged 25–34) would be twice more active than older workers (aged 55–64). The most interest for further training were shown by the persons with a tertiary level education (61,3 % for the EU-27 in 2011), while only 21,8% of those with the lower secondary education were the likely to have participated in it.

Except the background education, statistical observations in the EU-27showed the trend of three most commonly named obstacles for education and training (EUROSTAT 2011): 50% considered the training unnecessary; 21% claimed lack of time due to family responsibilities; 18 % complained for the conflict with work schedules (see Table 1).

TABLE 1. OBSTACLES TO PARTICIPATION IN EDUCATION AND TRAINING, 2011 (%)

Countries	Health or age	None within reachable distance ([1])	No time due to family	Did not have the prerequisites ([3])	Too expensive, could not afford	Lack of employer/ public service support	Conflict with work schedule	No need for (further) education and training	Other personal reasons	Could not find what was wanted([4])	No access to a computer or internet (for distance learning) ([5])
EU-28	8.5	6.1	20.9	4.2	13.2	8.0	18.0	50.0	14.6	8.6	1.6
Belgium	6.4	3.6	10.3	2.6	4.7	4.0	13.0	43.7	3.9	2.9	0.5
Bulgaria	3.1	3.8	6.2	2.4	8.9	1.9	7.2	88.8	2.8	2.2	1.4
Czech Republic	7.1	3.7	22.1	2.1	7.6	4.9	11.1	41.6	16.3	7.9	1.2
Demnark	7.0	2.2	12.0	2.0	14.4	10.7	16.8	:	5.5	13.0	:
Germany	12.1	5.6	23.0	7.0	13.3	10.6	21.2	76.4	19.0	10.0	1.8
Estonia	16.3	14.0	14.6	1.4	22.0	4.8	24.0	:	15.9	15.4	2.8
Ireland	3.1	2.4	28.4	3.1	8.8	2.0	6.7	6.0	4.8	2.7	0.8
Greece	18.3	10.4	39.3	10.4	28.4	5.7	23.2	42.2	21.7	21.3	2.5
Spain	5.6	2.3	30.7	3.2	6.6	7.5	20.5	11.5	21.6	4.7	0.6
France	5.1	6.3	6.5	4.5	11.6	14.1	15.7	78.6	5.8	9.8	1.9
Croatia	:	:	:	:	:	:	:	:	:	:	:
Italy	8.7	10.3	31.8	5.1	22.2	4.8	25.0	14.8	17.0	13.9	3.0
Cyprus	5.7	5.0	36.3	2.4	15.7	3.9	19.3	69.1	10.2	6.2	:
Latvia	3.8	6.8	9.9	4.9	19.3	7.3	15.3	87.7	4.6	9.4	2.3
Lithuania	14.3	3.9	9.4	4.3	19.0	2.0	20.0	68.4	16.4	2.8	1.3
Luxembourg	6.3	7.3	21.4	2.8	12.8	8.9	24.1	81.7	10.0	11.6	:
Hungary	4.6	5.1	6.7	2.3	11.4	4.1	8.2	87.3	1.6	2.0	1.3
Malta	4.4	1.4	17.7	1.6	6.9	2.3	19.1	:	7.9	1.9	:
Netherlands	16.2	11.7	37.3	4.3	19.5	12.0	28.4	51.9	19.9	15.7	2.6

Austria	5.2	8.0	13.2	3.0	7.4	5.1	12.2	:	4.9	5.3	1.6
Poland	11.6	2.9	21.6	1.8	15.5	5.2	11.8	60.1	13.6	5.7	0.6
Portugal	3.8	6.2	5.0	0.9	5.5	1.3	1.6	2.9	24.4	:	:
Romania	7.5	28.1	30.9	12.9	52.5	30.0	34.7	91.3	19.2	6.0	10.4
Slovenia	6.9	4.2	16.1	1.4	12.6	3.0	13.0	61.8	27.4	6.8	:
Slovakia	6.2	1.4	6.0	0.7	4.7	1.8	4.9	30.0	4.6	2.0	0.5
Finland	12.8	15.9	21.7	4.7	11.1	10.6	31.1	39.8	12.1	13.5	1.8
Sweden	8.1	7.9	18.4	4.2	10.2	8.6	16.6	63.3	26.0	9.2	:
United Kingdom	:	:	:	:	:	:	:	:	:	:	:
Norway	6.7	9.0	14.2	6.8	9.4	9.6	17.1	34.5	6.1	8.1	2.2
Switzer-land	18.5	15.8	34.6	8.0	31.8	19.3	39.2	70.4	71.5	22.5	4.8
Serbia	5.4	3.2	12.3	0.6	18.5	1.7	6.3	77.9	3.8	2.9	:
Turkey	3.5	3.0	14.0	4.6	4.3	0.9	3.5	82.8	3.9	2.0	0.2
Source: EUROSTAT, 2011.											

The abovementioned obstacles are also commonly cited in Ukraine by the rural citizens and citizens with medium or lower income. Still, there is a tendency for adults to start training for improving their professional qualifications, as well as for getting a higher degree for the job promotion. The input of a real sector of economics into educational programs development means a lot for their learning outcomes future applicability and efficiency of their graduates at work. Thus, the university graduates were involved in the curricula review providing their valuable and specific feedback.

Observation and Analysis Results: Teaching Foreigners and Adults in Ukraine

Another inflow of those who may study using the distance learning form of education are the foreign students, whose number has been constantly increasing since 2010. Mostly these are the citizens of African and Asian countries with either rather basic academic skills in the field of computer literacy and Internet navigation. The other difficulty is that in addition to their academic background that sometimes differs from Ukrainian significantly, due to the visa issues they are not able to start the educational process in time (1st of September). Some of them may be 2 months late for the academic year beginning, which means they should start learning something themselves. Sumy National Agrarian University has launched an educational project of the on-line courses at the MOODLE platform. The need to design the English language content and then upload it to the MOODLE set the problem of the teachers' e-learning basics literacy: we had to investigate the comprehensiveness of the open education and digital tools use within the educational process. Up to 80% of teachers cohort had their MOODLE training within next 3 years.

Students feedback and voluntary peer-review made us consider the effectiveness of an educational course design only by one teacher. A lot of factors that define the quality of the course and its future applicability by the students should be taken into account: educational and cultural background, cognitive skills, teaching approaches used by previous teachers, places of future knowledge application (both in geographical and management-practice sense). For example, the courses content delivered to a Ukrainian group of students and to a mixed one (or up to 100% consisting of foreign students) must be up to 50%

different, and if it refers to such courses as “Commercial Law of Ukraine” or any other course focused on Ukrainian legislation or experiences, the “international” content must occupy a bigger share.

For this, English-language literature had to be used which was absolutely absent at the Ukrainian market. The import costs of these books is usually 2,5 times higher than their original price. All these pushed the teaching staff to use as many Internet open access resources as possible facing more challenges to be learnt and solved: from intellectual property rights to technical implementation of the ICT tools into the educational process. It was a difficult and time and efforts-consuming process considering the lack of PC equipped classes, speed of the Internet, teachers’ and students skills in ICT use, their motivation to do so, etc.

EBRD/FAO Project Case Study. The observations results obtained during the implementation of two phases of a specialized modular training program "Successful Agribusiness Grain in a Small Area" (financed by EBRD and FAO under the support of the "Central European Initiative" Fund) represent a low potential for on-line education and OER use for rural citizens of Ukraine. They also demonstrated low motivation and very low ICT skills.

The training program was designed for representatives of farms with a land area up to 5 thousand ha and engaged 220 + 166 participants from 7 and 10 regions of Ukraine respectively to the project phase. The majority of the registered participants consist of the farms’ heads, their deputies (both cover 57%), agronomists, economists and engineers. The average size of participants’ farms area is 997 ha. During the project a tendency to attract more representatives of the households with a small land plot had been noted.

85% of the participants of the second phase were represented in the previous project stage. A deeper research on the topic showed that farmers if use the Internet for information search, use either news portals (as www.ukr.net or www.mail.ru) or specialised trading web-sites. More seldom advanced agriculture-targeted web-portals (as www.latifundist.com, www.fruit-inform.com or www.kurkul.com) are checked.

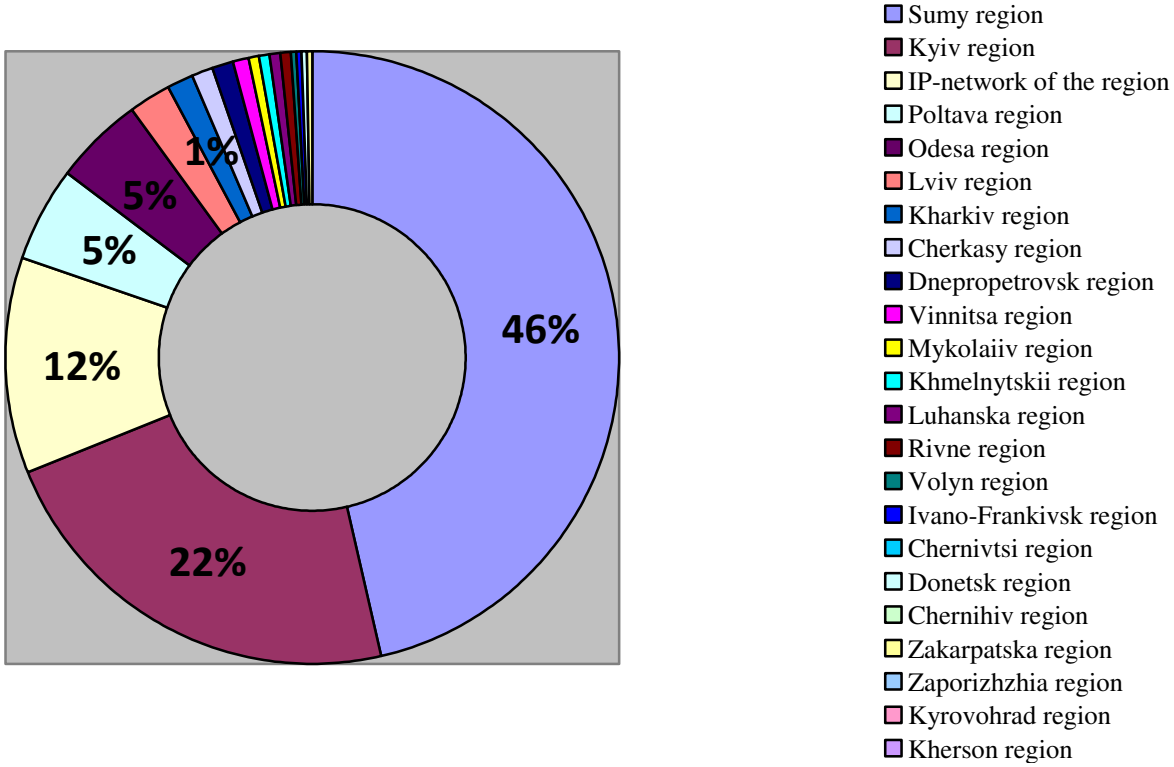
A specific training program was designed for each project phase containing face-to-face seminars, field trainings and an on-line course within the MOODLE platform (for example, at http://fao.sau.sumy.ua/login/index.php). The participants were informed about the on-line course opportunities and technicalities in live and also via direct e-mailing. The photo and video records of second phase project activities (trainings, press conferences at the regional and national levels) were placed at the project web-page (www.fao.sau.sumy.ua). On completion of each module the participants were tested on-line on mastering the theoretical and practical materials, the results of this formed each participant’s score within the entire project training course. The best results of the second project phase were awarded with an educational tour to France. Because of the presence of an additional motivation factor this paper presents namely the analysis of the second project phase covering 166 farmers form 10 regions of Ukraine.

For the wide promotion of the project results and an on-line course public access, there were a project web-page and a Facebook group links, as well as an inviting banner to the on-line MOODLE course created at the Sumy NAU official page (www.sau.sumy.ua). Promo videos and texts were constantly added to the project web-site telling about the launch\closure of the modules as well as about the invitation to the on-line course. The process of registration for participation in all the modules was carried out in several ways: online through the project website (2% of farmers used this tool), via email (only 10%) and, mostly, via direct personal phone calls. The results of the observations demonstrate that 100% of the farmers had the e-mail address, 70% used it personally and only up to 30% used it on a regular basis. Most of the project information requiring urgent farmers' feedback had to be delivered via the phone.

As for the reporting date of 02.03.2016 there were only 46% participants registered in MOODLE, originally coming from Sumy, Kyiv, Poltava, Odessa, Zaporizhzhya, Zhytomir, Kharkiv, Chernihiv, Lviv, Cherkasy regions of Ukraine. This number represents both urban and rural populated regions. According to the statistics of the targeted visits (1.10.2015 - 01.03.2016) there were 1867 unique visitors at the project web-site (for your information: a business website of a US SEO solutions firm "Brick Marketing" may get 1200 a day, a very large US law firm "Deckert" gets 3000 a day). The amount of traffic is got by the website depends upon the level of interest in what it is about. The project was strictly aimed at the small scale farmers who didn't surf the web much and thus were not visiting the web-site.

For the geographic structure of the project web-site visitors see Chart 1.

CHART 1. STRUCTURE OF THE VISITORS REFERRING TO THE REGIONS OF UKRAINE, %



Source: Own

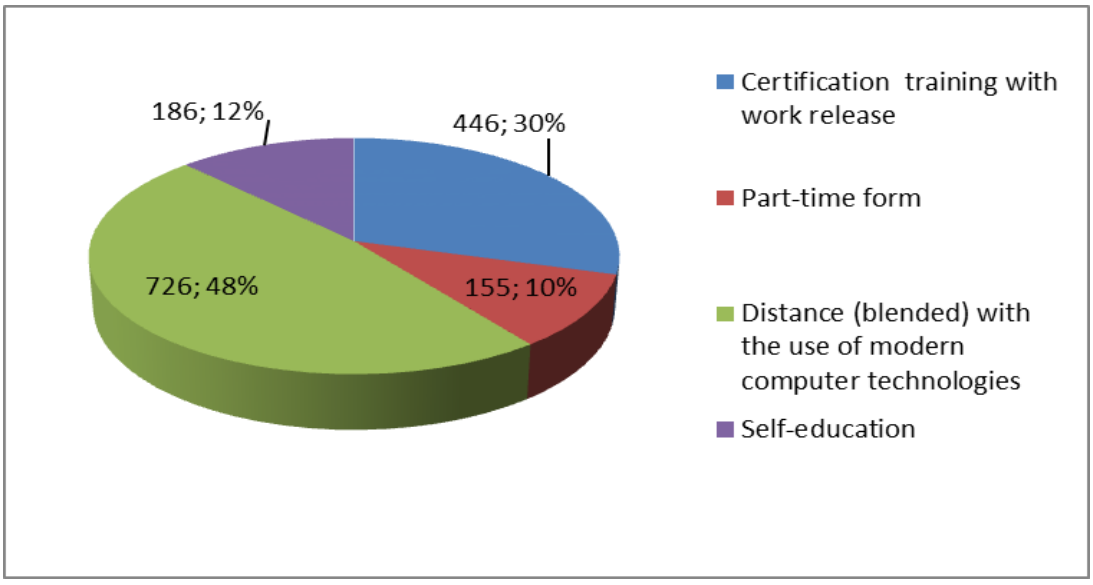
The main visitors of the project web-site come from Sumy, Kiev, Poltava, Odesa, Lviv, Kharkiv, Mykolaiiv and Cherkasy regions. Still, there were no applicants for the on-line course who were not directly contacted within the project scope. This shows low digital engagement of the target audience of the project which are the low scale farmers. Still we may note that the web-site was visited by people of different countries.

The project participants were also interviewed in order to obtain their feedback on satisfaction with the on-line learning process and difficulties they met. Handouts and information provided always pleased the majority of participants in terms quantity and being up-to-date, they also enriched personally and professionally the participants. It means that quality of the modules content did satisfy the majority of the participants. An overall assessment rate of the event level and its content was 4,77 points in average (maximum 5 points).

So Why the Knowledge Society Approach is Still Weak In Ukraine and Other Post-USSR Countries?

The Senior adviser at the Confederation of Finnish Industries Marita Aho (2009) expresses her vision of tomorrow's learning as a blended process of "combining for example e-learning and face-to-face classes, taking a formal course and working at the same time, learning with people with different backgrounds and nationalities, studying part-time and using learning services of both private and public providers". Her statement proves the current trends in modern educational philosophy implementation in the EU. Same, though, may be observed in Ukraine. According to the survey of a Centre for Senior Staff Retraining and Qualifications Improvement of the Ministry of Income and Taxes of Ukraine, which they conducted among their 1513 learners in 2014 (Chart 2), 48% of students defined distance (blended) learning form with the use of modern ICTs as the most desirable form of training. About 30% of respondents supported face-to-face training which means for them a release from their job functions for the training period (Lepekha, Sveshnikov, Demchenko, Kryzhanovs'kyj 2015).

CHART 2 - THE MOST ACCEPTABLE FORM OF CERTIFICATION TRAINING.



Source: Lepekha, Sveshnikov, Demchenko, Kryzhanovs'kyj, 2015

Another interesting point to be noted is that the largest number of students who have participated in online courses have done so hoping that "e-learning courses would be easier to absolve than the traditional classroom subjects". (Nagy 2015, 65) From the other hand, bad management of the teaching and learning process with the use of ICT may become stressful both for a teacher and a students in case they don't possess the necessary competences and don't have the opportunity/time/ability to gain them. Then "the process of learning may be reduced on pure formality which will grow into alienation" (Atanasoska, Andonovska-Trajkovska, Cvetkova 2016, 147). Being honest, teachers need advanced skills and some prior training or experiences for integrating ICT in the educational process. Gaining these skills depends on a number of factors of both subjective and objective nature. The studies of T.Atanasoska and her colleagues (2016, 153) shows that "the teachers use PowerPoint application in Microsoft Office mainly, and they use it every time when they are integrating ICT in the teaching process". Glance and colleagues (2013) found out that "the main tools used in a great number of MOOCs were formative quizzes, short video formats, peer and self-assessment and discussion forums". They consider it as a limitation to the educational abilities of MOOCs, as well as it demonstrates the lack of variety of tools necessary for the effective e-learning design. D. Laurillard (2006) found easy explanation for this phenomen more than 10 years ago: "Most staff using these technologies did not grow up with them". The issue is that this staff teaches the generation which was born within the knowledge society and will be using ICT since the early childhood.

In regard to this issue there is an important UNESCO document "ICT Competency Framework for Teachers" (2011) that defines the competencies for teachers who integrate ICTs into their professional practice. The Framework offers three consequent stages of a teacher's development: technology literacy,

knowledge deepening, knowledge creation. Ukrainian educational system is bound to meet the Framework approaches if it is to survive at the world market of educational services.

While the ICT tools potential to enhance the quality and scope of education is becoming ever better in the developed countries, not all universities and schools are able to use this potential possessing fewer resources. The UNESCO world report 2005 "Towards Knowledge Societies" states that "the concept of knowledge societies encompasses much broader social, ethical and political dimensions" (2005, 14). Being the representatives of a post-USSR society suffering from constant economic instability and political drawbacks, we think that namely social and political issues are the macro level obstacles for the knowledge society enhancement. Broad access to knowledge is a political risk of having "free minds", as well as a social risk of a growing number of "unsatisfied" who compared the state-of-the-art in their motherland to the other, more successful countries.

Frank La Rue, Assistant Director General, Knowledge Societies Division, Communication and Information Sector, UNESCO stressed during the world's largest annual gathering of the "ICT for development" community: "We need to guarantee public access to all, while improving content." (WSIS Forum 2017, 6)

Conclusion

The first phase of this comprehensive study was a thorough review of the education literature focusing on issues of the e-learning concept, the Community of Inquiry theoretical framework, lifelong learning in the context of the ICT skills development, pressing need for collaboration within educational content development. Further the authors deepen the research problem into the field of offering educational services to foreign citizens and adults by Ukrainian universities with the use of the ICT technologies.

As a describing background, the paper offers comparison of the general policy trends of ICT skills development and ICT tools support by the EU and Ukrainian government, their perception of the computer-based education under the influence of the new educational philosophy of prosumers. The main finding of this comparison is: the EU together with the UNO units has a strong strategy in this domain. Their approach is based both on comprehensive problem understanding (such as mental issues, psychological techniques) and material maintenance of its development (infrastructure, funding and training programmes). The majority of CIS countries can't boast with something even remotely similar using rather a "got problem – started to look for the solution – while was searching, the client dealt with it somehow" approach. Namely this issue makes it difficult even to use the Internet opportunities designed and launched by other developed countries (Open Education Resources, high quality hardware/software, prosumer philosophy for getting the information you need). Even if we imagine that suddenly the legislation is changed and all educational institutors are well equipped from tomorrow, Ukrainian society will find out that they lack even the teachers with relevant skills of implementation of the ICT tools into

the educational process. Same trend is noticeable under the circumstances of a growing Internet speed and thus the quantity of its users, but low awareness of the Intellectual Property Rights protection and of the open education concept. Also, similar challenge is imposed to the legislation in the field of ICT and Internet use. That is why a question for further discussion is: what is the best mode for enhancing the knowledge society in such post-USSR countries as Ukraine?

From this review, a conceptual framework of the successful computer-mediated communication with the learners was assumed basing on the experiences of the research team which were gained during the process of creation of the university curriculum for foreign students (7 years) and adults (4 years), as well as with participating in the professional and career development competences of a university teacher. The analysis of the data and observations obtained during the implementation of the educational projects with the use of on-line resource formed the following conclusions:

- On-line education is powerful tool for the learners having some barriers on their way to the university (as distance, health, finances, lack of time, etc.). Almost 50% of students defined distance (blended) learning form with the use of modern ICTs as the most desirable form of training;

- The insufficient infrastructure (number of computers, low Internet speed, relatively high costs for ICT skills training, etc.), low awareness in ICT and advanced computer skills potential, weak state policy result in low computer skills and low efficiency of digital resources use;

- Limited skills of teachers in the use of ICT skills for the educational process improvement limit the students' opportunities for the future, as well as reduce the OER and ICT potential;

Learners coming from the narrow professional field or a specific territory (being the rural residents or foreign citizens) have different requirements towards the learning outcomes, course content and the way it's presented;

- There is a tendency for adults to start training for improving their professional qualifications, as well as for getting a higher degree for the job promotion;

- Broad promotion of the Internet resources of the educational project, without specific skills and serious money inputs, doesn't guarantee a big number of their users, especially if the target audience come from the computer and web-marginalised territories;

- Bad management of the teaching/learning process with the use of ICT may become stressful both for a teacher and a students in case they don't possess the necessary competences and don't have the opportunity/time/ability to gain them;

- A lot of factors define the quality of the course and its future applicability by the students: educational and cultural background, cognitive skills, teaching approaches used by previous teachers, places of future knowledge application (both in geographical and management-practice sense).

The results gained were proven by the experiences of other teachers in Ukraine, that's why the further scientific work may lay in search of the modes of prosumers philosophy development in terms of teacher and student specifics. Next, there is also a need of developing the creativity in ICT use both by teachers and students, development of their critical thinking and self-managing learning skills.

As it may be seen from the overview and observations results given above the last decade in the EU and Ukraine is known as a period of intensive recognition of the educational needs of the knowledge society due to arisen opportunities that the ICT offers for the educational system. Majority of the critical principles of e-learning design include giving some level of control to the learner (like pushing the pause or forward button during the on-line course) who becomes a prosumer: a producer and a consumer at the same time. The Community of Inquiry framework theory developed between 1997 and 2001 assumes that "knowledge can be constructed through social negotiation and that discussion with others - peers or tutors" (Amemado, Manca 2017, 24)

Our society has been fundamentally changed by the impact of the Internet which means that increasing instability of employment and professions may be reduced by the development of people competences in enhancement of the emerging knowledge society of sharing. Adult education (both of teachers and other adult citizens) is an essential condition for its development. The range of possible benefits covers practically all areas of social life where knowledge and communication are crucial: "from improved teaching and learning processes to better student outcomes, from increased student engagement to seamless communication with parents, and from school networking and twinning to more efficient management and monitoring within the school" (UNESCO 2011, 4). However, much work is still to be done before we truly realise what a worthwhile educational experience can be delivered on-line.

Acknowledgements

The authors would like to thank the European Bank for Reconstruction and Development (EBRD) and Food and Agriculture Organization (FAO) for the opportunity to participate in the two stages of the project "Successful Grain Agribusiness in a Small Area" (2014-2016), supported by "Central European Initiative". The received statistical and empirical data gathered a valuable data base for the analysis and empirical conclusions presented in this publication.

References

Aho, M., 2009. “Learning in and for the knowledge society”. Open Education Europa. https://www.openeducationeuropa.eu/en/article/Learning-in-and-for-the-Knowledge-Society, accessed 22nd May 2017.

Amemado, D., 2014. “Integrating Technologies in Higher Education: the Issue of Recommended Educational Features Still Making Headline News”. Open Learning: The Journal of Open, Distance and e-Learning, pp. 28-29.

Amemado D., Manca S., 2017. “Learning from Decades of Online Distance Education: MOOCs and the Community of Inquiry Framework”. Journal of e-Learning and Knowledge Society Vol. 13, No 2, pp. 22-25. http://www.je-lks.org/ojs/index.php/Je-LKS_EN/article/view/1339, accessed 22nd May 2017.

Atanasoska, T., Andonovska-Trajkovska, D., Cvetkova, B., 2016. “Use of the Internet – Support for Teaching and Learning in the Primary Education in Macedonia”. The 11th International Conference DisCo 2016: “Towards Open Education and Information Society”, 20th to 22nd June in Prague. pp. 147-156.

Baddeley, A. D., Hitch, G. J., 1974. "Working Memory". In Bower, G.A. The Psychology of Learning and Motivation: Advances in Research and Theory. New York: Academic Press. pp. 47–89.

Business of Zacarpathia, 2016. "The Coverage of the Internet in Ukraine for the First Time Exceeded 60% - Statistics". Business of Zacarpathia. http://www.businessz.com.ua/news/events/616, accessed 2nd June 2017.

Deloitte Limited, 2014. “A Quick Guide to EU Funding 2014 – 2020”. Deloitte Limited, Grants & Incentives Unit (5-7). https://www2.deloitte.com/content/dam/Deloitte/cy/Documents/finance/CY_Finance_EUFunding2014-2020Guide_Noexp.pdf, pp. 5-7 accessed 22nd May 2017.

Derevianenko, O., 2016. Report “ICT in Education. Strategy and Priorities“, Mninistry of Education and Science – Parliament Hearings. http://osvita.ua/school/49783/, accessed 2nd June 2017.

EUROSTAT, 2011. “Adult Education Survey (AES)”. EUROSTAT. Your Key to European Statistics. February 2012. http://ec.europa.eu/eurostat/web/microdata/adult-education-survey, accessed 22nd April 2017.

EUROSTAT, 2017. “Digital Economy and Society Statistics - Households and Individuals”. EUROSTAT Statistics Explained. February 2017. http://ec.europa.eu/eurostat/statistics-explained/index.php/Digital_economy_and_society_statistics_-_households_and_individuals, accessed 2nd June 2017.

Garrison, D. R., Anderson, T., Archer, W., 2000. “Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education Model”. The Internet and Higher Education, 2 (2-3). pp. 87-90.

Glance, D. G., Forsey, M., Riley, M., 2013. “The Pedagogical Foundations of Massive Open Online Courses”. First Monday, 18 (5).

Laurillard, D., 2006. “Rethinking University Teaching: a Framework for the Effective Use of Learning Technologies”. Abingdon, Oxon., RoutledgeFalmer.

Lepekha, O. Y., Sveshnikov, S. M., Demchenko, H. V., Kryzhanovs'kyj, V. I., 2015. “European Experience in Implementing the Latest Learning Technologies in the System of Professional Development of Tax Authorities”. Centre for Retraining and Qualifications Improvement of the Senior Staff of the Ministry of Income and Taxes of Ukraine. http://2015.moodlemoot.in.ua/course/view.php?id=80, accessed 22nd May 2017.

Lipman, M., 1991. “Thinking in Education”. Cambridge: Cambridge Univ. Press.

Petegem, W. V., 2009. “Learning in and for the knowledge society”. https://www.openeducationeuropa.eu/en/article/Learning-in-and-for-the-Knowledge-Society, accessed 2nd May 2017.

Nagy, P.K., 2015. “College Students' Motivations for Signing up for E-learning Courses”. DISCO 2015 From Analog Education to Digital Education. Prague :Center for Higher Education Studies. pp. 65-75.

Peters, A. M., Britez, G. R., 2008. “Open education and education for openness“. Sense Publishers, Roterdam. https://www.sensepublishers.com/media/729-openeducation-and-education-for-openness.pdf, accessed 22nd April 2017.

Statistical Bulletin, 2017. "Status and Development of Ukraine's Communication for 2016". State Service of Statistics of Ukraine. http://www.ukrstat.gov.ua/druk/publicat/Arhiv_u/08/Arch_zva_bl.htm, accessed 2nd June 2017.

UNESCO, 2011. “UNESCO Information and Communication Tools Competency Framework for Teachers”. http://unesdoc.unesco.org/images/0021/002134/213475e.pdf, accessed 2nd June 2017.

UNESCO, 2005. “Towards Knowledge Societies” UNESCO World Report 2005. http://unesdoc.unesco.org/images/0014/001418/141843e.pdf, accessed 3rd June 2017.

UNO General Assembly, 2015. „Transforming Our World: the 2030 Agenda for Sustainable Development“ Resolution adopted by the General Assembly on 25 September 2015. http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E, accessed 2nd June 2017.

WSIS Forum, 2017. “WSIS Action Lines: Information and Knowledge Societies for SDGs Version 1.0”. The World Summit on the Information Society. Outcome Document. International Telecommunication Union (ITU), Geneva. https://www.itu.int/net4/wsis/forum/2017/Content/docs/outcomes/WSISForum2017_ForumTrackOutcomes.pdf, accessed 3rd June 2017.

Consulted Websites

Merriam-Webster Dictionary on-line: https://www.merriam-webster.com/about-us,

Wikipedia https://www.wikipedia.org/

Open Source Website: https://opensource.com/resources/what-open-education

UNO Website: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

Open Education Europa Portal: https://www.openeducationeuropa.eu/en/article/8-things-educators-need-know-about-copyright-and-open-resources

The Community of Inquiry: http://coi.athabascau.ca/

Brick Marketing Company: http://www.brickmarketing.com/blog/how-many-website-visitors.htm

Help Everybody Everyday: http://www.helpeverybodyeveryday.com/websocial-media/2094-how-much-traffic-should-your-website-get

POTENTIAL OF LIBRARIES IN OPENING THE ACCESS TO LIFELONG LEARNING

IVA JEDLIČKOVÁ

Faculty of Education
University of Hradec Králové, Czech Republic

e-mail of corresponding author: iva.jedlickova@uhk.cz

Key words: Libraries, Adults, Attitudes toward education, Questionnaire

Abstract: This paper deals with the role of libraries in opening learning opportunities to adult people. Wider access to learning activities of adults is understood as an important feature of a learning society. Libraries belong to those culture institutions, which can provide non-formal education and informal learning. It is important for supporting the participation of adults in further learning, because in many cases adults do not plan to enter formal education programs.

The aim of this paper is to present how the potential of libraries for opening access to lifelong learning opportunities is evaluated by adult people in present time in the Czech Republic.

A particular survey of attitudes of adult people was carried out in March 2017 in the region of Hradec Králové. The goal of the survey was to find out, if the role of libraries in lifelong learning is understood and used by adults as the target group of librarian activities. A quantitative research strategy was chosen – the questionnaire was distributed among adults with an experience with learning activities in the adult age and expected positive attitude towards learning. At first the opportunity of respondents to use regularly a library and librarian services was investigated, followed by the habits of respondents to use these services and their participation in educational programs of libraries – lectures, lecture cycles, workshops etc. The data were analyzed and interpreted in connection with the gender and age characteristics and the social status. According to the survey results, the access to libraries and using the librarian services are very high and reach more than 90 %, but the participation in educational programs organized by libraries is substantially lower and does not reach 50 %. As a conclusion, it must be stated, that the potential of libraries in lifelong learning is not used enough.

Introduction

Lifelong learning belongs to the most important characteristic features of the current, so-called knowledge society and learning society. It has become the topic of the national and multinational educational policy documents and also a natural part of leisure time activities of adults. As important topic of adult education theory the participation of adults in educational activities and the attitudes of adults towards educational opportunities are investigated (Rabušicová, Rabušic 2006). Lifelong learning includes, of course, not only formal education, but also (maybe first of all) non-formal education and informal learning. Adults in many cases do not plan to enter formal education again, they prefer to participate in non-formal education (Kopecký, Šerák 2015). As a potential institution of non-formal education libraries are understood, based on several reasons.

Libraries belong to traditional cultural institutions in many – not only European – countries. Focused on collecting, keeping and making accessible various information sources to either specialized target groups or wide population libraries (as specialized as public ones) are generally understood as a part of cultural heritage. Especially the type of public libraries, which are opened to the whole population in concrete location, is felt as the heart of cultural life, first of all in small places. That means, libraries have an important position in keeping cultural and intellectual level of population, across professional, educational and social groups of population. Besides making accessible collected information sources – for example (but not only) in printed books, there is the possibility to make access the outcomes of development of sciences in a different way, it means in the form of organized educational activities. Lectures or lectures

cycles, seminars, workshops and other forms of education activities are organized by the most of libraries, both public and specialized ones. Role of libraries in adult education has been already formulated as an important topic of scientific interest first of all by the theory of adult education (Allred 1989), from partial points of view by the librarians and library managers (Ashcroft et al. 2007).

Traditional librarian services focused towards public users, as collecting and lending books and other informational sources are understood by public users as the main purpose of libraries and used by them in a high volume. Although the other possibilities of making access to results of scientific development, such as above mentioned educational activities, have become an obvious part of librarian activities, it is not sure, that these activities are known in the wide population. There is a part of population, which does not expect lectures etc. organized by libraries and in libraries. It ought to be a topic of research if the educational activities are known to the population and if they are exploited.

The goal of the survey was to find out, if the role of libraries in lifelong learning is understood and used by the adults as a strong target group of librarian activities, if the adults know, that there are such librarian services, which are able to support them in their both non-formal education, and in-formal learning. It is important to discover it from several points of view:

a. from the point of view on the target group: for finding, if the education and learning opportunities are near enough for the majority of adult population (and "near enough" is understood here in the real sense of these words), if they are available to so many potential users as possible,

b. from the point of view of libraries and their founders (Ministry of Culture etc.): it is necessary in effort to more effective using of existing network of libraries or individual librarian institutions,

c. from the point of view of librarians, organizers of education and lecturers: for higher effectiveness of organization of education activities.

Survey concept

As the way for finding answers to these questions it was decided to carry out a particular survey of attitudes of the adults in one of the regions of the Czech Republic. For the survey the quantitative research strategy was chosen, taking advantage of this strategy, the possibility of comparatively wide data acquisition, and – of course – with respecting of limits of the quantitative approach. For the data collection a short questionnaire was created with six closed items. The purpose for this questionnaire form was to reach relatively high return rate with real and true answers. Of course, the above mentioned limits of this approach, as for the veracity of respondents and their answers, had to be accepted.

The Hradec Králové Region was chosen as the region for the survey execution. This region can be understood as a typical average region of the country (and its administrative center, Hradec Králové as a typical town, too): with no extreme characteristics, which could effect on the survey results, i.e. on the

attitudes of respondents towards learning (for example: it is not the capital region with highly developed labor market and education market, too, it is not a pure industrial agglomeration with special determination of demands on professional competencies, not an outstanding region with limited possibilities on the labor market with influence on the motivation of adults for further education etc.).

This survey did not have the ambition to be a complex research addressing a representative sample of the adult population; as the first step in this investigation of the attitudes of adults towards education activities organized by libraries we addressed as the respondents those adults, which are currently provably interested in any form of education activities – in formal education (they are full-time students, part-time students) or in non-formal education (they participate in other forms of educational activities, for example in the courses of the University of the third age). These respondents have an experience with learning activities in the adult age and generally positive attitudes towards learning. In their case a positive reception of librarian education activities can be expected. It will indicate the statement in a wider concept of investigation addressing the whole adult population.

The survey was carried out in March 2017 in Hradec Králové, during various educational activities organized by the university. The respondents were not exclusively inhabitants of the regional center – they live and work elsewhere, too. The survey sample made 420 adult persons, taking part in courses or lectures at the university. The only intentional aspect acting in addressing the respondents was the proportional representation of three age groups: till the age of 25 years, from 26 to 55 years, and the age of 56 years and more. The reason of this approach lies in one of the particular questions: if there are differences in the survey topic related to the age that means if young adults, middle-age adults and older adults differ in the use of librarian services and educational opportunities in libraries. Further demographic features as gender and social status belonged to the questionnaire items, too, but they were not the intentional aspects for addressing the respondents. In relation to these features it has to be stated that their application appeared not so simple: to begin with gender, firstly the majority of female respondents was very high (86.6 %) in the respondents´ sample, secondly there were no remarkable differences in answers between male and female respondents. As for the social status, another situation appeared. The respondents were asked to declare, if they study, work or care for child or if they are pensioners. Of course, these characteristics may be relevant for the attitudes toward using of librarian services and of the education opportunities of libraries, too. The answers showed, that nowadays the full-time students work quite often (in 46.1 % cases), the part-time students declare studies and work together and the pensioners have their work and some of them declare, they study (in more programs of the University of the third age). So the boundary between categories of social status at least in the feeling and opinions of our respondents disappeared.

The questionnaire focus was represented by two main items: at first the accessibility of libraries for respondents was found out, because it is the starting point for using librarian services – only those people can have the benefit from them, which have the access to any library. Using of librarian services – the extent and concrete way(s) of it – solved the question focusing in the survey topic. Following item asked the respondents about their participation in educational activities in libraries, the extent of this participation and – in the negative case – about the reason of no participation. These findings represent the key answer on the survey´s topic concerning the current using potential of libraries in opening more access to learning in the adult age.

Survey results

At first some basic data to the final extent of survey and characteristics of respondents: From 420 distributed questionnaires 380 could be analyzed, that means 90.5 % (28 questionnaires were not returned, further 12 had to be excluded, because of uncomplete answering). In the framework of this sampling was the distribution in the age categories as follows: in the first age category till the age of 25 years 134 questionnaires were analyzed (35.3 %), in the age category from 26 to 55 years 122 questionnaires (32.1 %) and in the third age category (56 years and more) 124 questionnaires (32.6 %). Gender characteristics of respondents were already described above: from 380 respondents 86.6 % were women and only 13.4 % were men. This fact influenced the origin plan to find potential differences in the attitudes of men and women rather negatively – the answers of such low number of male respondents can be hardly presented as a relevant state. As for the social status, the characteristics of respondents was not clear enough for making single-valued statement, as it was mentioned in the presentation of the survey concept.

According to the respondents´ answers, availability of libraries and librarian services is absolute: for all of them is at least one of the most frequented library types available: either public library or research library or university library (in rare cases respondents mentioned another, specialized library). Availability of one type of library declared 38.2 % respondents, whereas availability of all three (in the questionnaire item offered) library types declared 42.6 % respondents. The absolute availability of libraries is not surprising, of course (in relation to the tradition of librarianship in the middle Europe and the network of libraries); this item – among others – helped the respondents as the starting point for following items.

The fact, that for all respondents at least one type of library is available (and that they know it), does not mean, that all of them in fact use it, although there is no great difference between availability of a library and practical using of it. A huge majority of respondents declared either often and regular visits of a library (in order to borrow home books from library holdings) or occasional visiting of a library for borrowing books home or reading books, journals or magazines in place. Altogether 91.1 % respondents are the users of these traditional librarian services. This fact is very important for consequences concerning potential of libraries for wider access to education opportunities. For completing of received data it is necessary to

mention, that only 6.0 % of respondents declared they do not need to use librarian services or have no interest in it (as additional explanation one of the respondents named “large book collection at home”). Only 2.9 % respondents do not visit a library due to lack of time, nobody (!) due to lack of finance.

The most important questionnaire item focusing on the education potential of libraries asked the respondents, if they visit educational activities organized in libraries often/regularly, sometimes/not very often or not at all (as educational activities were “lectures, lecture cycles, courses” mentioned for clear understanding the question for all the respondents). Participation in these activities is considerably lower, than the using of traditional librarian services: only 11.1 % respondents participate often or regularly in lectures, courses etc., further 34.1 % respondents participate sometimes or not very often in them. That means that less than a half of librarian visitors (45.2 %) use the opportunity of educational activities in libraries. This finding shows the unused potential of libraries in the topic of our interest. As for those respondents, who do not participate in educational activities, 26.6 % declared, that it is due to lack of time, 2.9 % due to lack of finance, and 17.6 % respondents answered, they do not know, that there are such possibilities (further 9.7 % were not interested in the offered topics). The number of those, for whom the content of this question was a new information, could be even higher, than it was declared through the answers. When a part of target group of educational activities does not know, that there are such activities, it ought to be surely an impulse for improving the state.

More detailed data from answers in this item are remarkable, too. In this item the subgroups of respondents differed in a big range: Differences between answers of those adults, who attend the educational activities of libraries, are crucial from the point of view of age – while young adults and middle-age adults attend these activities in a comparable rate (29.9 %, resp. 35.2 %), older adults participate in these activities significantly more often – in 71.8 %. There are also differences in some aspects of negative answers, it means answers of those respondents, who do not attend educational activities in libraries. These differences are connected with the age structure, too: Young adults did not know about these educational activities or they were not interested in them more often (41 %), than the older adults (16 %). Similar result we find in the case of other reasons for no participation in educational activities of libraries.

Both positive and negative answers concerning orientation of adults in the educational opportunities of libraries and their attitudes towards them together with more detailed data give an important feedback to libraries.

Conclusion

This chapter deals with chosen aspects of the role of libraries in supporting adults in lifelong learning. It focuses on the potential of libraries in opening more access to educational activities, because the availability of libraries based on the density of their network is very high. This fact enables a very good

access to educational activities organized in libraries and by libraries, namely for those adults, who do not want (or do not dare) to enter formal education or long-term non-formal education. As a contribution to this topic this partial survey investigated some aspects of using the libraries by adults. Used method of a short questionnaire brought important data concerning both the availability of the libraries and librarian services, and attitudes of adults towards educational opportunities in libraries. Of course, the survey results are seen with accepted limits for their generalization according to survey regional execution and above mentioned characteristics of respondent sampling. This survey was declared as a partial contribution to the potential of libraries in supporting lifelong learning of adults that means further surveys in this topic are necessary.

Presented survey confirmed general availability of libraries and a very high rate of using librarian services by adults across the age subgroups of respondents. This positive fact could be a good way out for using the educational offer of libraries by adults, but the current situation does not correspond to this expectation. Less than a half of respondents and less than a half of those who visit libraries (to borrow books, read journals etc.) participate in educational activities. This disproportion of potential and real participants of educational activities of libraries shows where the effort of librarian creators and organizers of educational activities ought to be focused – firstly in new ways of promotion of educational activities to adults, secondly in investigating the needs and expectations of adults concerning education.

References

Allred, J. 1989. vLibraries and Adult Education“, in: Titmus, C. (Ed.) Lifelong Education for Adults: An International Handbook. Oxford, Pergamon Press, pp. 302-306.

Ashcroft, L., Farrow, J. Watts, C. 2007. “Public libraries and adult learners“, Library Management, 28 (3), pp.125-138.

Kopecký, M., Šerák, M. 2015. “Adult Education and Learning Policy in the Czech Republic“, in: Milana, M, Nesbit T. (Eds.) Global Perspectives on Adult Education and Learning Policy. Palgrave Macmillan UK, pp. 29-43.

Rabušicová M., Rabušic, L. 2006. “Adult Education in the Czech Republic – Who participates and Why“. Sociologický časopis/Czech Sociological Review, 42 (6), pp. 1195–1218.

THE MAIN CHALLENGES TO OPEN EDUCATIONAL RESOURCES IN UKRAINIAN CONTEXT

OLHA ZHORNOVA

Academia for Monitoring and Expertise, Ukraine
OLENA ZHORNOVA

Institute for Consolidation and Partnership, Ukraine

e-mail of corresponding authors: zhornova@ukr.net; acadmonex@gmail.com

Key words: Open educational resources, work with open educational resources, Ukrainian universities, teaching staff,

Abstract: The study is focused on the possibilities and problems of using Open educational resources in Ukraine.
In the context of this study the definitions of the work of open educational resources relate to higher education teaching and learning is to make effort to free use, adaptation, and distribution teaching, learning or research materials that are in the public domain or released with an intellectual property license.
The brief overview of the literature reviewer shows: the open educational resources issue is not considered a priority for classification of keywords; the problem of development of open educational resources is not fully appreciated by the educational researchers; existing studies and reports on related issues are a serious basis to further researches.
Information about work with open educational resources was received from the semi-structured interviews and consultations with Ukrainian experts, namely 21 teaching staff. In additional, there was a workshop that focused on the preparation of Ukrainian teachers to the work of open educational resources. The workshop included the discussion about the programme to learn work of open educational resources and self-assessment of it competence.
The challenges are embedded in existing problems of higher education and widely – of reform in Ukraine. Two challenges where are illustrated by means of examples from key informants.
We think that realising the full benefits of open educational resources can in practice be more challenging than learning how to work with open educational resources. This is a prerequisite for realising the full benefits of open educational resources.

Introduction

Without any doubts OER has an important role in the development of society (UNESCO). OER gives the additional opportunities for higher education institutions to better make the efforts to growth well-being of society as to promote productive self-identity in the field of education. First, self-identity in the field of education is a social practice. This means that the results of self-identity in the field of education as the social practice should be analyzed in the context of changes in habitual actions of the individual, which were conducted as a result of its rediscount achievements and perspectives in learning educational programmes.

Second, the self-identity should be analysed in the field of education of the limited scope of the actual experience of daily life. These frames refer primarily to peculiarities of the personal understanding of the educational reality in which it is located. This understanding is manifested in the judgements in general, different and specific conditions for learning programmes. The learning programmes are for the individual a fragment of organized activity. For the individual, this fragment is important regardless of the process of poverty alleviation.

Self-identity in the field of education management is individual and collective efforts to change lifestyle. Moreover, self-identity in the field of education is the practice of selecting future lifestyle for selected learning programmes – a kind of "permission" to use education as a resource for overcoming poverty (Zhornova 2014, Жорнова 2014, 2015).

However evaluating universities' efficiency by their place in the world rankings which is a trend of recent years has led to the goals unattached to growth well-being of society because the overcoming poverty is not the indicator in it rankings (Жорнова 2013).

Some NGO made and continues to make the efforts to strongly promote the idea of the existence of total issues in higher education institutions and raise the question of the real cost of Higher Education for Ukraine. However the answer to this question is why "low quality, high expenses needs more persuasive arguments than following interpretation from the Accounting Chamber of Ukraine "According to the Accounting Chamber of Ukraine, in 2012 about 41% of school leavers were admitted to privately funded programs, in 2015 this number amounted just to 26%. The state paid for the education of almost three quarters of applicants. This completely undermines the idea of the competitive admissions and decreases the quality of education" (Repko 2016).

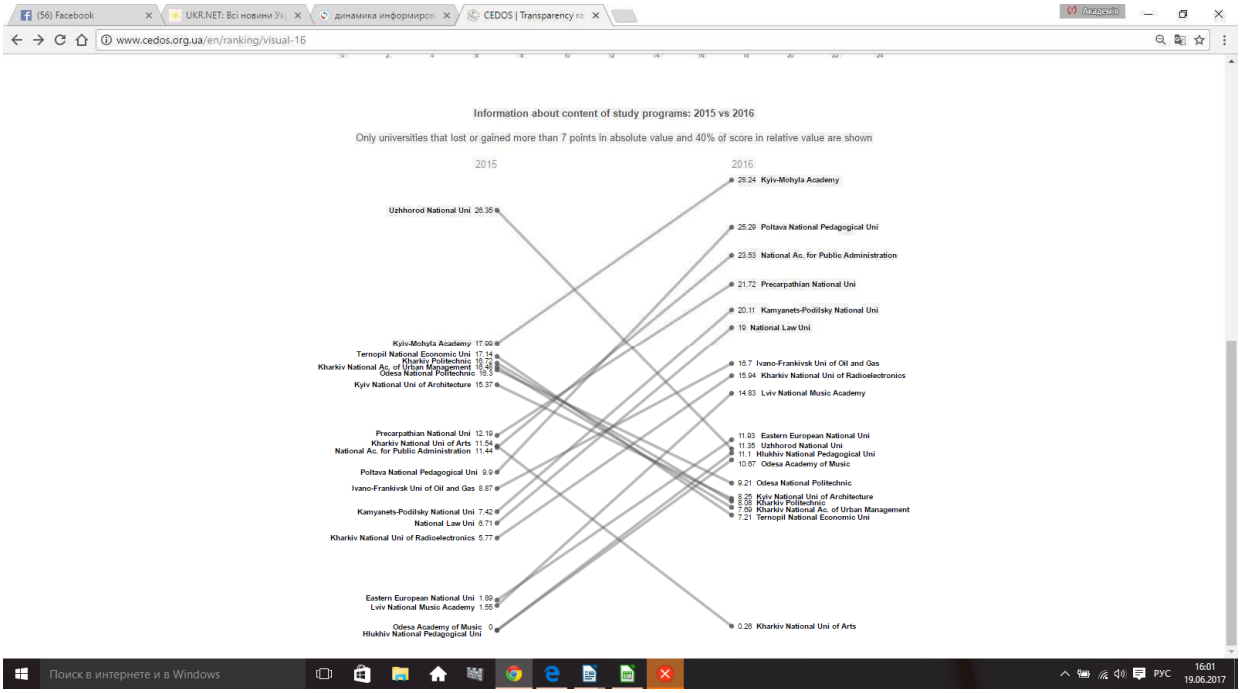
Today there are more than 700 of universities, institutions and agencies focused on providing various educational services. We did not found official statistic on the number of open learning materials from universities. May be such data is absent.

It is necessary to say, that attempts to find out in which measure educational materials from universities are open for society. In CEDOS' view the main purpose of the Transparency Ranking of Ukrainian universities is one of many quality assurance instruments to find best practices among HEIs and offer those practices (CEDOS).

The indicator "Information on HEI's website about the content of a study program" which shows how universities use their websites to inform about the content of their study programs, in particular, list of academic disciplines, short description of discipline's objective, knowledge and skills it helps to gain, information about the number of hours or the number of ECTS credits within information about academic discipline, types of work within information about academic discipline, points distribution within academic discipline, who is teaching each academic discipline, presence of information about opportunities for internships, Ukrainian and English version of ECTS information package are of most interest in the context of our study.

There are different views on the Transparency Ranking of Ukrainian universities (from defiance to active use). Each university got individual recommendations based on results of the Ranking on how to improve content of their sites. We see changes of position from high to low. The picture 1 shows how content of study programs was changing.

PICTURE 1. INFORMATION ABOUT CONTENT OF STUDY PROGRAMS: 2015 VS 2016



It should be noted that among strong adherents of OER's idea, there is IT community. The representatives of this community started platform “Prometheus” (Prometheus). The part of teachers which supports OER's idea as the access to the really curriculum and really learning content from really Ukrainian universities shares the critical attitude towards platform's policy. They insist that the open courses from the platforms are simple texts as examples of pop-science. Such unreal picture could have negative impact on image of quality of higher education and learning outcomes. Another aspect is the lack of proper attending to WOER focus, which leads to contrary cause of incorrect and/or unauthorized use of the open texts. So far it is easily possible to notice academic plagiarism (Vesti).

Thus promoting of the idea of OER in Ukraine is often single and chaotic and calls for planned efforts focus on reinforced motivation of the teaching staff as key subject of educational changes. Over the past two-five years, numerous of supporters of OER's idea have emerged in teaching, management and academic circles. Such supporters of OER's idea need achieve critical mass for real turn in the university’s policies towards OER. So our main research question is how to turn irregular and unimportant work with OER into regular and substantive one.

Key definitions of research

We introduce the concept of work with OER proceeding from the fact that the concept of OER implies that educators, students and self-learners not only understand, know how to use adaptation, and distribution of digitized materials from repositories but they already do it. Where Ukrainian colleagues do not have such experience; the use, adaptation, distribution of digital materials did not become an obligatory

component of their professional activities. Therefore, at this stage of development of OER in Ukraine, it is better to refer about Work with OER (hereinafter – WOER).

The definitions of OER from Wikipedia and UNESCO (UNESCO) are the basic for the definition of the WOER which is purposeful effort to gain experience for free use, adaptation, and distribution teaching, learning or research materials that are in the public domain or released with an intellectual property license. In the context of this research the definitions of WOER relate to higher education teaching and learning is to make efforts to free use, adaptation, and distribution teaching, learning or research materials that are in the public domain or released with an intellectual property license. OER' competence is understanding how to use, adapt HE teaching, learning or research materials that are in the public domain or released with an intellectual property license.

Method and methodology

The methodology relies on conducting face-to-face semi-structured interviews and consultations with experienced practitioners or/and expert as key informants. The semi structured questionnaire was developed by the authors of this research and includes information schedule about the possibilities to make the WOER regular and actual, the level of ambitious of it efforts, mind of additional or more appropriate target which should be suggested, the basic difficulties of WOER, the impact of WOER in teacher's career.

In our view, the possibilities to transform the WOER from irregular and irrelevant to regular and actual could be described if we find out: Who and how form agenda of teachers' professional development for your university?

For determine the level of ambitious of this effort we asked: Do you believe that teaching, learning and research are improved when educational resources are more open and more accessible? How the WOER could impact to well-being? and Who can be leader of the WOER?

The starting point for an understanding of additional or more appropriate target was that the need to consolidate the efforts to share the OER' idea.

To describe the basic difficulties of WOER, we clarified: What difficulties do they face? What do they do in order to reduce these difficulties? What the collection and/or repositories of courses do you know and use? What the gaps in the materials from it collection and repositories do you see?

To characterize the impact of WOER in teacher's career we asked: What is the professional advantage of young teachers? What is professional advantage of seniors?

In additional, there was a workshop that focused on the preparation of Ukrainian teachers to WOER. The workshop "Enhanced preparation to WOER" included the discussion about the programme to learn WOER and self-assessment of OER' competence. The self-assessment of OER' competence was in two

stages: in the period immediately prior to start of the workshop and in its final stage. The basis for the questionnaire “The self-assessment of OER' competence” is the list of skills from “Introduction to Open Educational Resources” by Judy Bake (Mahony 2016).

The answers to this question were received from the semi-structured interviews and consultations with Ukrainian experts, namely 21 teaching staff. This interview and consultations were organized by The Academy for Monitoring and Expertise and Institute for Consolidation and Partnerships from January to May 2017.

The sample of this research consisted of 21 key informants: female – 14, male – 7; under 35 years – 5, from 35 to 60 – 12, over 60 – 4. All of them have the professional experience more than five years and at least at two universities. Also each of them takes active part in science conferences and they are the experienced practitioners.

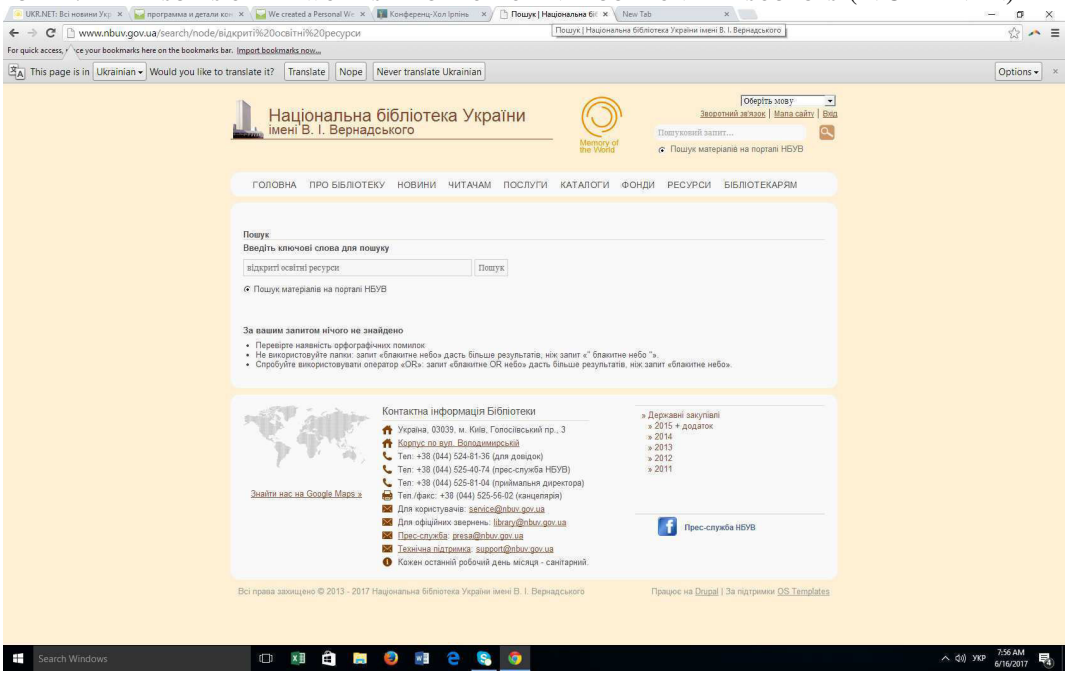
Participants of workshop were 12 teachers: female – 9, male – 3, under 35 years – 4, from 35 to 60 – 5, over 60 –3.

Literature Review

A keyword search for ‘open educational resources’ on Vernadsky National Library of Ukraine returns zero results, apparently on screenchots (picture 2, 3). We explain why we chose it is this library.

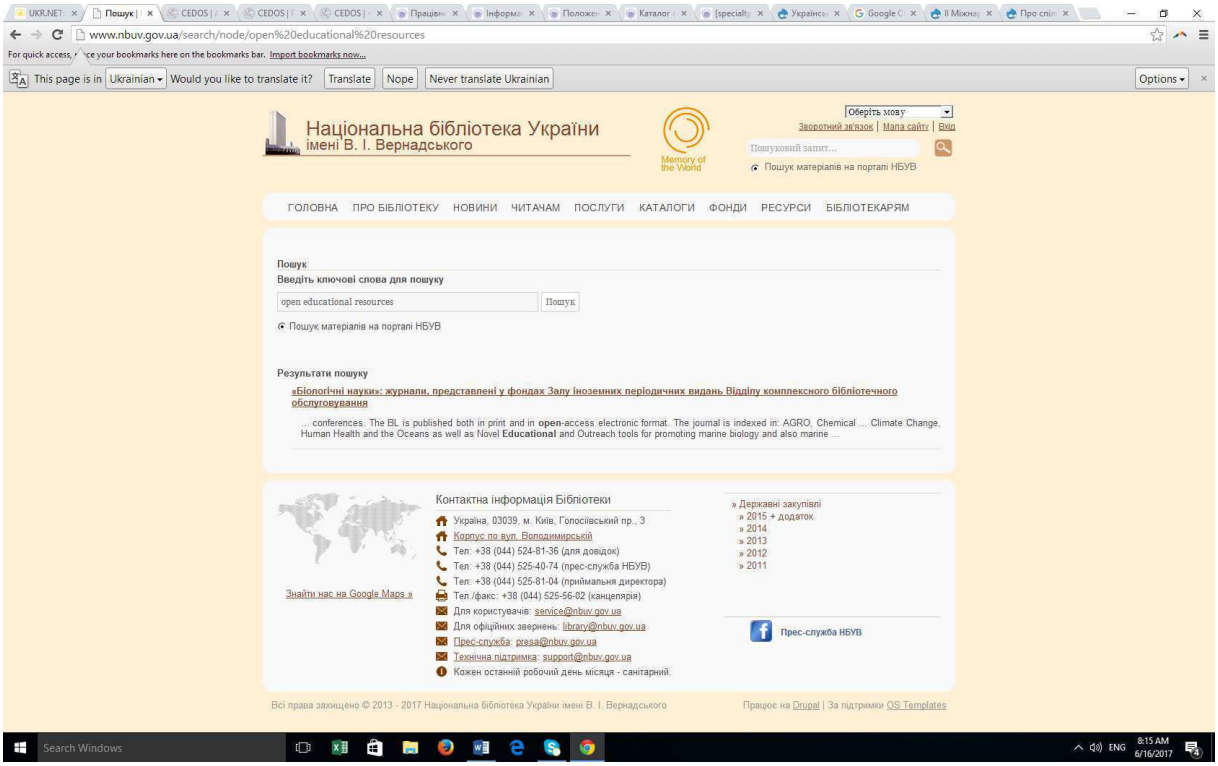
As stated on website is “Vernadsky National Library is the largest library of Ukraine, Chief Scientific Information Center of the State. Ranked among the top ten national libraries of the world“ (National Library of Ukraine).

PICTURE 2. THE RESULTS OF KEYWORD SEARCH FOR 'OPEN EDUCATIONAL RESOURCES' (IN UKRAINIAN)



Source: own

PICTURE 3. THE RESULTS KEYWORD SEARCH FOR 'OPEN EDUCATIONAL RESOURCES' (IN ENGLISH)



Source: own

A keyword search is particularly useful to understand what topics are related and providing relevant researchers. We must state that there were results to the keyword search that could be regarded as partly relevant. One of the argument that its sovereignty claim is Ukrainian scientists have number of studies which shows following.

We were among the earliest who spoke of the significance of OER. We have previously reported that OER are of essential importance for laying a foundation that should support further reform and modernization of education (Жорнова, Жорнова 2013).

The results of analysis of basic terms used in a research on a designing of electronic educational resources for educational purpose from Melnik (2015) are show the definitions of the different scientists of the terms, specifies the semantic content of such concepts as “modernization of education”, “information and communication technologies”, “design of electronic educational resources”, “electronic educational resources for educational purposes”, “electronic educational games”, “learning tool”; defines the synonyms of certain of the terms that have spread in the scientific and pedagogical literature both in Ukraine and abroad.

However, the concept of OER is not found along with the concepts of “design”, “electronic educational resources for educational purposes”, “electronic games for educational purposes”, “learning tools”. Thus the keywords of the article “Priority fields of teachers’ professional development in such terms of open

education worldwide" by Avshenyuk (2016) are open educational resources, Massive open online courses (MOOC), MOOC platforms, connectivism, cognitive behaviorism, teacher professional development. As stated in abstract "The author analyzes the project "Massive Open Online Courses" (MOOC) as one of the modern achievements in the area of ICT for the development of adult education, namely teachers' professional development in the context of globalization". The Ukrainian context as local context is not the subject of the given research.

Our attention attracted the article "The Mobile Space and Mobile Targeting Environment for Internet users: Features of Model Submission and Using in Education" by Bykov (2013). Article submitted the results of the analysis of the use of mobile devices in education. Keywords of it article are educational process, mobility, migration model, remote technology, open technologies, the mobile space, mobile-oriented environment. The author points out that the paradigm of open and equal access to quality education is basic for the use of mobile devices in the educational process. However, in the article the idea of the PR is traced only in the background and, to some extent, as a consequence the creation and storage of mobile communications resources.

A review of Reporting Scientific Conference of the Institute of Information Technologies and Learning Tools NAPS Ukraine was undertaken to gather additional information. We analyzed Reporting for the last 4 years (2013 – 2016) (Reporting Scientific Conference). We emphasize that scientific research subject of the Institute aimed at developing basic and applied research on the creation and use of modern means of education and information technology in education (Institute of Information Technologies and Learning Tools). The analysis showed that the OER is not among the keywords. Although indicated on the site of the Institute that "The main efforts of the Institute aimed at solving problems to create learning environment in secondary schools, adequate state of technological development of society, in particular the development of ICT implementation of ICT-based distance learning system to enhance the professional skills of educators ". However, the study of the issue how Ukrainian universities to improve the idea of the OP is absent.

It should be given credit that the Institute is an organizer ICTERI. ICTERI is "the first traditional scientific and practical international event of high level in Ukraine in the field of educational sciences. Over the past more ten years ICTERI brings together who interested in the dissemination and exchange of experience in innovative technological developments and achievements, implementation and use of ICT in education (ICTERI). This year the Conference included three international workshops (Professional Retraining and Life-Long Learning using ICT; Theory of Reliability and Markov Modeling for Information Technologies; Rigorous Methods in Software Engineering) which indirectly related with OER for higher education.

The brief overview of the literature reviewer is shows:

The OER issue is not considered a priority for classification of keywords.

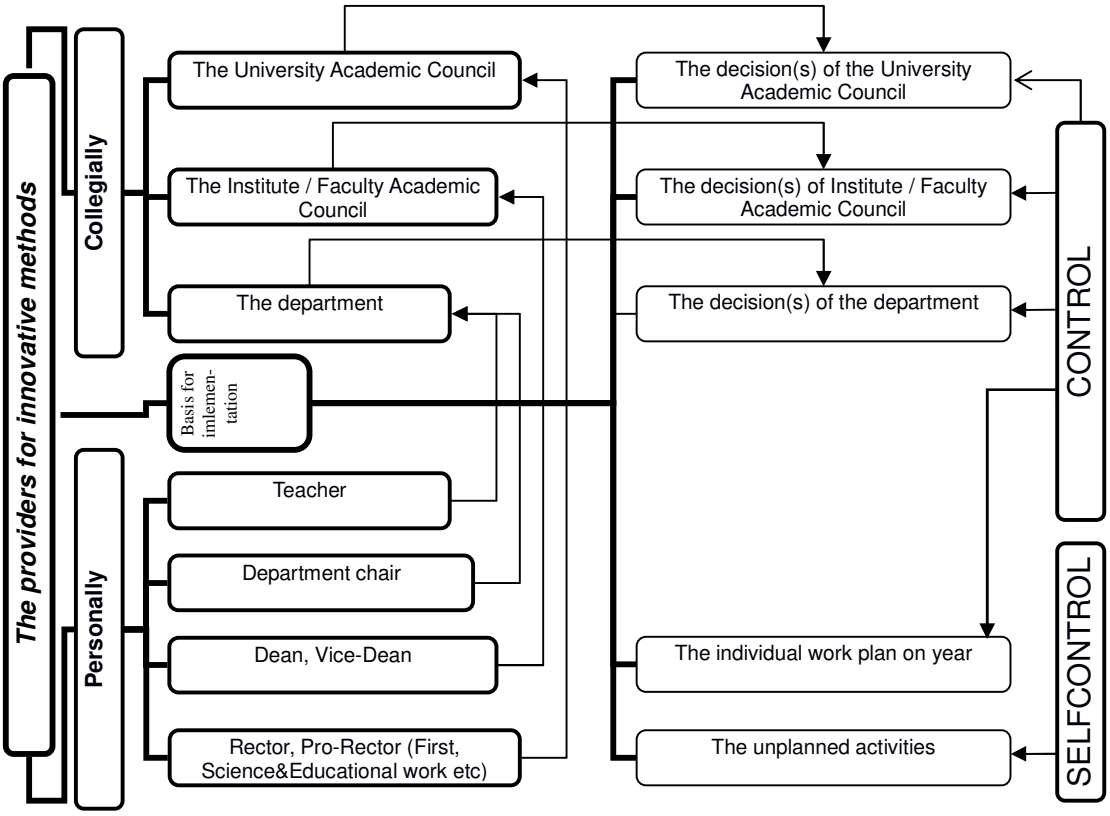
The problem of development of OER is not fully appreciated by the educational researchers.

Existing studies and reports on related issues are a serious basis to further researches.

Empirical research

The information about providers to innovative methods of teaching by key informants is on figure 1.

FIGURE 1. THE PROVIDERS FOR INNOVATIVE METHODS HE TEACHING : ANSWERS OF KEY INFORMANTS



Source: own

Clarify: among key informants: 7 are the member of University Academic Council, 5 are the member of Institute or Faculty Academic Council, 9 are participants of gathering of department. Below are some of key informant's remarks.

“Very difficult to be heard if you don't have a voice on Academic Council” (the participant of gathering of department).

"The result of all this innovative methods is usually weakly " (the participant of gathering of department).

“Need to facilitate the match between OER' demand and supply from teaching staff. As a pilot project can be created component registry Ukrainian PR. Teachers will give their content exclusively on its own

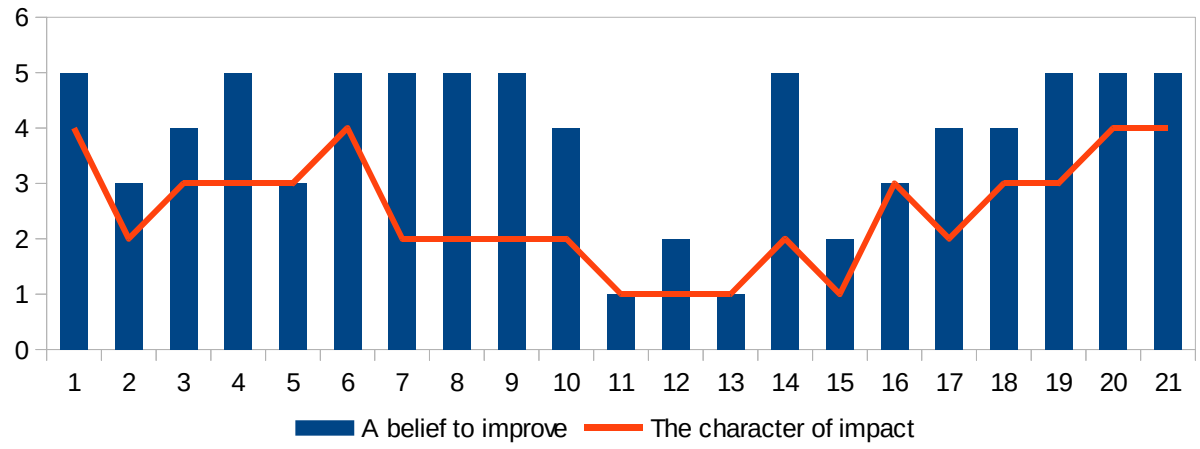
initiative and free. Provider of the service may be NGOs. This will prevent pressure on the teacher. The register usually collects, codifies and stores three set of information: 1) learning and teaching material; 2) data on author; 3) on cooperation supply. Today, many different services record such data on IT platforms that accept the storing and simple recovery of need dataset" (the member of Faculty Academic Council).

"I am unlikely to be only person who has the feeling of deja vu when referring to additional innovation" (the member of University Academic Council).

"Most of the questions in this interview are a surprise from what is being discussed today." (the member of University Academic Council).

We attempted to examine whether there is a connection between the answers to these questions: 'Do you believe that teaching, learning and research are improved when educational resources are more open and more accessible?' and 'How the WOER could impact to well-being?' A belief to improve is described as: strongly believe (5) – believe (4) – either way (3) – disbelieve (2) – strongly disbelieve (1). The character of impact is described as: very good (5) – good (4) – both characters (3) – bad (2) – very bad (1). In the figura 2, see the results of the answers to the questions.

FIGURE 2. A BELIEF TO IMPROVE AND THE CHARACTER OF IMPACT TO WELL-BEING



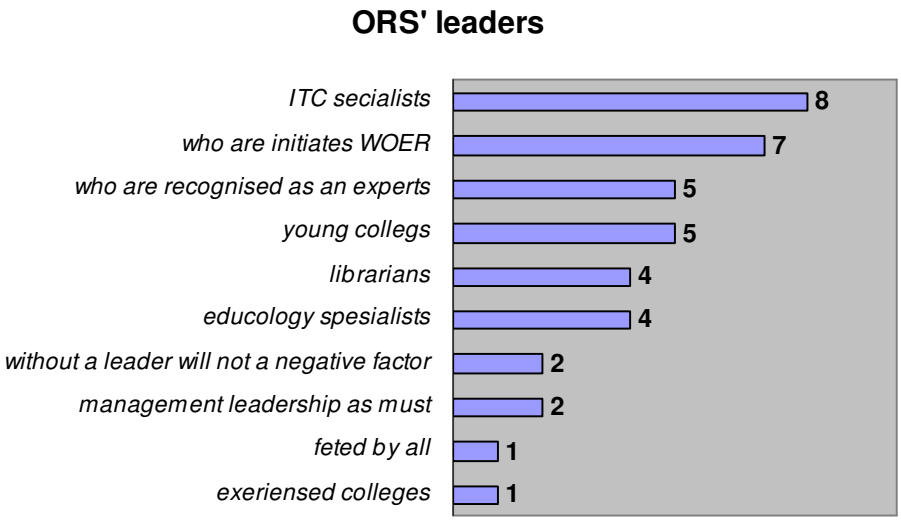
Source: own

The figura 2 is presented follow: our key informants more believe that teaching, learning and research were improved when educational resources are more open and more accessible then well-being of staff could growth if WOER will as daily practice.

When we asked the key informants who on your mining can be leader for the WOER that they named following post/positions: "management leadership as must", "who is initiates WOER", "who is recognised as an expert", "an educology specialist", ICT specialists, "experienced colleges", young colleges,

librarians, “feted by all”, “without a leader will not a negative factor”. In the picture 3 shows the named positions. It is striking that no one called their position.

FIGURE 3. OER'S LEADERS



Source: own

This can be explained as shifting responsibility. All were called or position, or a specialty. So they specified the person, in their view, who would be responsible for OER. It is a specification of personal responsibility whereas in previous answer about the sources of innovation they talked mainly about collective responsibility.

All replies confirmed that teachers agree that: the different institutions and organizations who understand how important OER is in reforming higher education need consolidate their own efforts to share the OER’s idea; the teachers are actively engaged in sharing the results informally with colleagues within and outside their organization. There are contradictory replies how to do it. For examples:

“When staff introduces innovations on their own initiative, they try very hard but they like it.

That's all that matters.”

“Put enough funding at stake to create an incentive for staff to improve WOER, and see what will”

“The big achievements in field of OER will be, when will be the understanding that practical use and creating of OER is important to the quality assurance of modern teach. The WOER must become an everyday reality for staff and management.“.

"I'm tired of having to implementation of innovations by trial and error. Such efforts ought to be the one in trouble. It's all such a mess. I should stop making the same mistakes over and over again”.

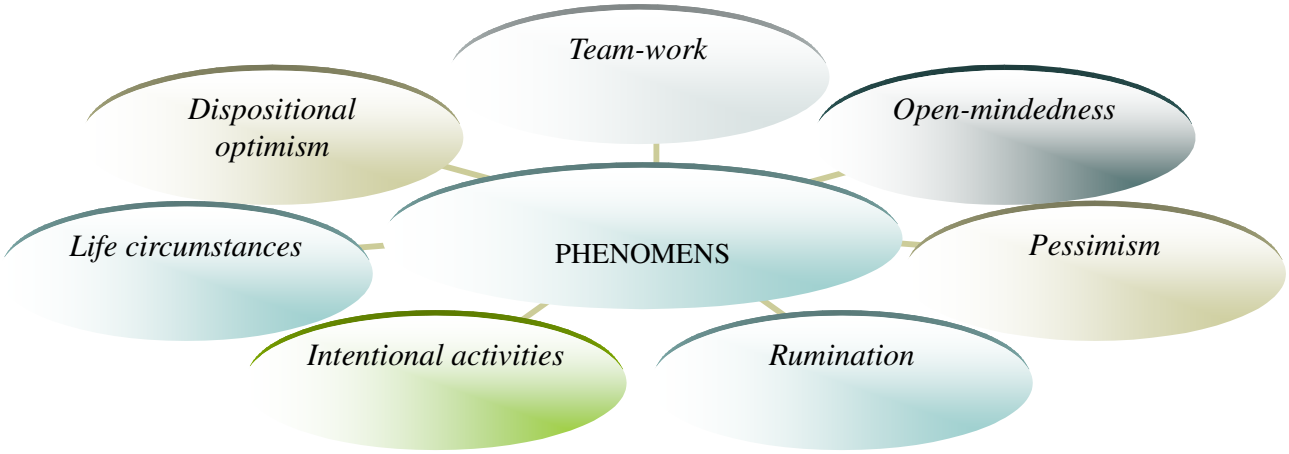
“We need basically build teams. The promotion of OER is team efforts.”

"Like it or not, it'll happen and OER will become habitual for Ukrainian teachers. I am sure."

"Each teacher must ask himself/herself: Can I influence the OER from my university and its future? I think the stronger "Yes" is as indicator of quality of teaching".

All replies could different on basic their relationship with the phenomens which show on figura 4.

FIGURE 4. THE BASIC PHENOMENS FOR WAY TO OER



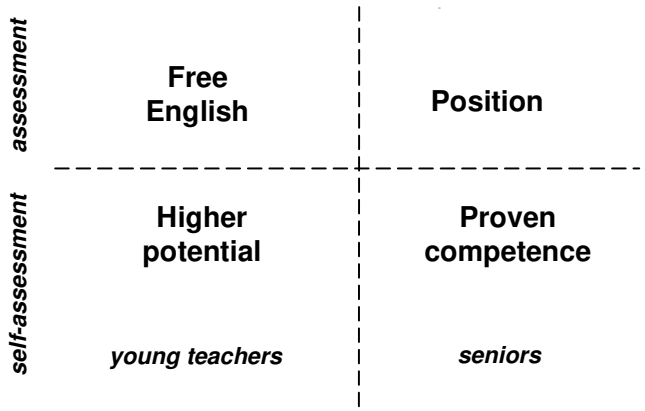
Source: own

Next questions related with definition of professional advantage. We asked what is professional advantage of young colleagues and what is professional advantage of senior colleagues. We shared all respondents into two categories (before and after 35 years, respectively - young and senior) in order to separate the start and top career. So each respondent called two professional advantages, one of which concerned his age group, and the second – the other. We have four blocks of professional advantages:

1. The professional advantages of young teachers from their point of view.
2. The professional advantages of seniors from their point of view.
3. The professional benefits of young teachers in terms of seniors.
4. The professional benefits of seniors in terms of young teachers.

We defined the above-mentioned blocks of professional advantages as a self-assessment and evaluation of professional advantages. We are interested to find out how the professional advantages relate with WOER. The following is a generalized list of professional advantages on figura 5.

FIGURA 5. THE BLOCS OF PROFESSIONAL ADVANTAGES



Source: own

Below see some characteristic examples of replies by key informants.

"Today those who do not speak English generally considered disadvantaged. These individuals are generally older and they have more professional experience."

"Who have experience as well? Who speak English. No matter what are you a specialist, the main thing is to speak English fluently. "

"Young people can do research that no one would ever forget."

"The higher position provides success and additional opportunities."

Analysis of empirical results

By interviewing informants we were elicits responses that focus on how the reformed system of higher education contains opportunities for perceptions of WOER as irrelevant. Almost half of the respondents (43%) believe that corruption is an obstacle to educational reforms anyway.

Answers to the first pool of questions allowed to find out that:

1. There are collegial and personality providers for innovative methods of teaching. If this is collegial provider then "many managements and much ado about nothing", if this is personality provider then "do it yourself and don't hurt anyone".

2. Absent of the management's pressure is key advantage of self-control. The extended results are the main advantage of control.

3. The intentional activities besides official non-existent and uncontrolled should enable teachers to fulfill their potential as innovator and realize their views on new style of HE teaching.

4. The intentional activities is way to avoid unnecessary procedural discussions with biased or/and incompetent colleagues.

Therefore, almost all expressed deep concern that current arrangements to stimulate innovative methods of HE teaching is inefficiencies and need of change.

Impact evaluation of WOER on/to well-being of teachers are carried very rare, almost not carried because it requires lot of resources as they are lengthy and costly. However, they are indispensable to:

- decide whether materials from OER were adequately designed, targeted, sequenced and used;

- measure the impact of work with OER on individuals in terms of their health as physical, psychic and social well-being (Zhornova and Zhornova 2013);

-compare the quality of different materials;

-demonstrate what materials are most useful and for whom.

For more understanding of relationship between age and position of key informants, their level of English, how strongly they believe to improve teaching, learning, research and what they definite the impact of WOER to well-being of teachers we used correlation analysis. In the **table 1,** the results of correlation analysis.

TABLE 1. CORRELATION BETWEEN AGE, POSITION, LEVEL OF ENGLISH, BELIEF TO IMPROVE AND CHARACTER OF THE IMPACT OF WOER TO WELL-BEING OF TEACHERS

po		Age	Level of English	Belief to improve	Character of impact	Position
	Age	1,000	-,287	-,654**	-,455*	,388
	Level of English	-,287	1,000	,532*	,557**	,176
	Belief to improve	-,654**	,532*	1,000	,613**	,223
	Character of impact	-,455*	,557**	,613**	1,000	,100
	Position	,388	,176	,223	,100	1,000

Sig. (2-tailed)
**. Correlation significant at the 0,01 level (2-tailed)
*. Correlation significant at the 0,05 level (2-tailed).

First of all note that there has been found to be a strong positive correlation between 'A belief to improve' and 'Character of impact' (0,613). Also there is strong positive correlation between 'The level of English' and 'Character of impact' (0,557). Also there is strong but negative correlation between belief to improve and age (-0,654). For age, there are strong negative correlation with 'A belief to improve' (-0,654) and with 'Character of impact' (-0,455). The only exception is 'Position' which is not correlation.

In our view, some indicators appear to be more important than others to obtain the WOER as component of normal teaching practice.

From this we can conclude that young teachers are better messengers for OER' idea at this stage of development of OER.

Then there's the OER' leader situation. So, was named ten positions. We called it the scattered positions. Common to such a scattered position is the responsible for OER as the part of the responsible for the innovations is the competence provider of best modern practices for all staff. In this role they must have competence to promote, design and implement OER' instruments related to improve the efforts of higher educational institution to improve the principles of openness and accessibility of higher education. Wide growth well-being of society supports productive self-identity of anyone in the field of education.

The answers of the next pool of questions demonstrated that informants feel uncomfortable because they do not have answers to these questions. Some are confused by open educational resources with big data, some said that they heard about open source because their friends used the picture solar cell on sites of open resources. Hence a conclusion about a place of work in the agenda is today the WOER is low on the agenda.

All key informants agree that the different institutions and organizations, who understand how important OER is in reforming higher education, need to consolidate their own efforts for /to share the OER's idea and also need to coming in OER's community. Young teachers could serve/become/be as a basic of the relationship with OER's community. Relative majority of young teachers (compared to more old groups) believe that the dialogues with foreign colleges is a really effective way to "coming" in community. But their views how improve the world standards and/or best practices in Ukraine are not unanimous and even contradictory.

The question is why the best practices by OER's leaders slowly implement or don't implement in Ukraine? If foreign OER's practices are "straitjacket" then question "How to avoid best practices "straitjacket"?" is very actual. Best foreign OER's practices promote certain and predictable results. However, non supporters/sticklers cite rigid adherence to their practices as a factor leading to brake of the motivation to create educational innovations and slowness to their implementation in constantly changed situation. The key informants have stated that foreign practices must be flexible and relevant to Ukrainian teachers. The OER's practices will not be effective unless they are well-communicated and accessible.

The database of OER is not accessible because there are HE teachers who don't speak English, they cannot good search cases for their own teaching disciplines.

If we compare how teachers define professional advantages then become clear following:

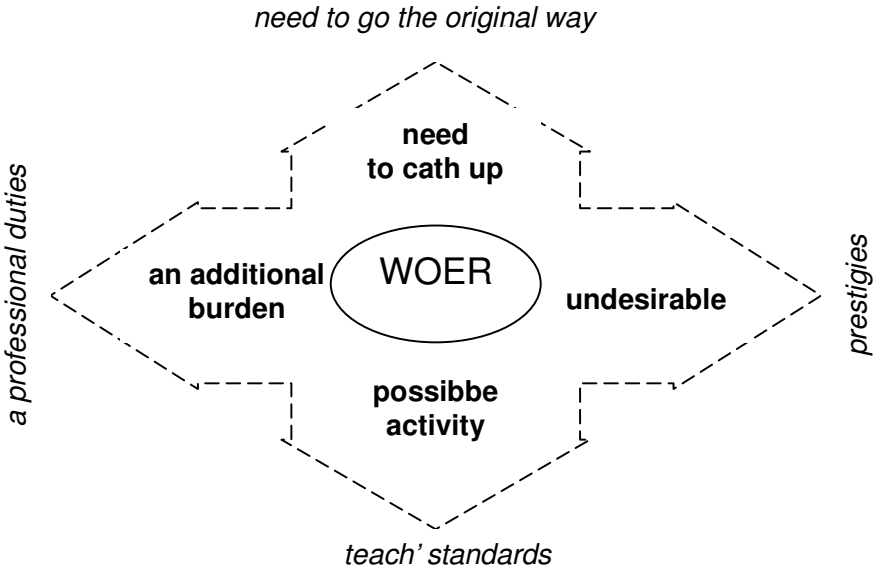
1. Assessment is more concrete than self-assessment.

2. Self-assessment of young and self-assessment of seniors has different vectors of deployment. So, speaking of the professional advantages of their own group, young teachers focused on the future, seniors - in the past.

It is possible to speak of professional advantages as abstract and concrete, past and future. But complete separation of points between young teachers and seniors gives rise to pretentious self-assessment of their own professional advantage. This self-assessment is consequence of exaggerating input into development of higher education. We believe that pretentious self-assessment is unfortunate situation which is consequence of growth constraints faced higher education institution in Ukraine.

So the WOER is understood very widely: from undesirable to prestigious; from an additional burden to a professional duty; from possible activity to teacher's standards; from need to catch up with OER's leaders to need to go the original way. Generalized continuum as result of empiric study is on figure 6.

FIGURA 6. GENERALIZED CONTINUUM OF WOER



Source: own

Our next step was the workshop "Enhanced preparation to WOER". This was in addition to the interviews with key informants to confirm the preparedness of Ukrainian teachers to become a proud member of OER' community. All participants have the experience of preparation of curriculum and textbooks.

The main task of the workshop is to discuss the programme to learn WOER. The participants were informed about the topic of the workshop. Everyone knew about the upcoming tasks and what will happen to workshop.

Short plan of workshop: 1. The incoming self-assessment of OER' competence. 2. Introduction. 3. First group work on training programme "The WOER". 4. Work on the book "Introduction to Open Educational Resources" by Judy Baker. 5. Second group work on training programme "The Work With OER". 6. The outcomming self-assessment of OER' competence.

Introductory talk for acquaintance with the experience of the participants of the work-shop focused on following questions: How quickly can you change the content of course if to appearance the results of new researches? What have you learn and are learning from their example? How does your colleges' experience influence your style of teaching? How do you change your style of teaching to become closer to the eligible state of professional experience? How will your professional experience differ from its current state? What kind of HE teaching and learning does your universities strive to become in 7-10 years?

We also asked about the arsenal of teaching materials and the tools for activities in field of OER (lecture presentation, course materials, topics for seminar discussions, tests, a reading list, class-based task or exercise, exam questions, textbooks, streaming videos, software and other). Our questions are who creates materials, how they are created?

Look at the results of self-assessment. Remember that self-assessment was in two stages: in the period immediately prior to start of the workshop and in its final stage. We said the participations that this is a questionnaire designed to measure what they are thinking about the level of their OER' competence at this moment (from -2 as I don't know to 2 as I know). In the table 3, see statistical evaluation of the significance of the change which was assessed using Sign test (Z) and Wilcoxon signed-rank test (W).

TABLE 2. THE RESULTS OF INCOMING AND OUTGOING SELF-ASSESSMENT OF OER' COMPETENCE

I know how to		Respondents											
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1	Define and describe OER.	1	1	1	0	-1	0	-1	2	0	1	-2	0
1^2		2	2	2	2	1	1	1	2	2	1	1	2
2	Identify sources of open course ware for use in their own teaching disciplines.	1	1	2	0	0	0	1	1	0	-1	-1	1
2^2		2	2	2	1	1	1	1	2	1	1	1	2
3	Define copyright, fair use, the TEACH Act, and intellectual property	-1	-1	0	0	-1	0	-1	0	0	1	-1	0
3^2		1	1	1	1	1	1	1	2	1	1	1	0
4	Identify resources for use of primary sources as learning materials in their own teaching disciplines.	2	2	1	2	1	1	1	1	0	1	1	1
4^2		2	2	2	2	1	1	2	1	2	2	1	2
5	Identify resources for locating OER in their own teaching disciplines.	1	1	1	1	1	1	0	2	1	2	1	1
5^2		2	2	2	1	2	2	2	1	2	1	1	2
6	Establish criteria for selection of public domain textbooks.	0	0	0	-1	-1	0	-1	1	0	1	0	-1
6^2		2	2	2	2	1	1	1	2	2	1	1	2
8	Identify the requirements for OER in order to comply with ADA Section 508 requirements.	0	0	-1	1	0	0	-1	1	0	0	-1	1
8^2		1	1	1	1	1	0	1	2	1	1	0	2
9	Determine cost-effective printing options for students.	2	1	1	1	1	0	0	2	0	1	-1	1
9^2		2	2	2	2	1	1	1	1	1	2	1	2

TABLE 3. STATISTICAL EVALUATION OF THE SHIFT IN OER' COMPETENCE

#	H_0	Criterion	Relevance	Decision
1	Median of differences between first and secondly self-assessment of competence to define and describe OER equals 0.	Z	,002[1]	The null hypothesis is rejected
		W	,004	The null hypothesis is rejected
2	Median of differences between first and secondly self-assessment of competence to define and describe OER equals 0.	Z	,002[1]	The null hypothesis is rejected
		W	,003	The null hypothesis is rejected
3	Median of differences between first and secondly self-assessment of competence to define and describe OER equals 0.	Z	,002[1]	The null hypothesis is rejected
		W	,004	The null hypothesis is rejected
4	Median of differences between first and secondly self-assessment of competence to identify resources for use of primary sources as learning materials in their own teaching disciplines. equals 0.	Z	,062[1]	**The null hypothesis is accepted**
		W	,034	The null hypothesis is rejected
5	Median of differences between first and secondly self-assessment of competence to identify of resources for locating OER in their own teaching disciplines equals 0.	Z	,109[1]	**The null hypothesis is accepted**
		W	,052	**The null hypothesis is accepted**
6	Median of differences between first and secondly self-assessment of competence to define and describe OER equals 0.	Z	,001[1]	The null hypothesis is rejected
		W	,003	The null hypothesis is rejected
7	Median of differences between first and secondly self-assessment of competence to define and describe OER equals 0.	Z	,002[1]	The null hypothesis is rejected
		W	,003	The null hypothesis is rejected
8	Median of differences between first and secondly self-assessment of competence to define and describe OER equals 0.	Z	,021[1]	The null hypothesis is rejected
		W	,013	The null hypothesis is rejected

We see there are positive shifts in the ability:

to define and describe OER, copyright, fair use, the TEACH Act, and intellectual property;

to identify sources of open course ware for use in their own teaching disciplines, the requirements for OER in order to comply with ADA Section 508 requirements;

to establish criteria for selection of public domain textbooks;

to determine cost-effective printing options for students.

For the ability to identify resources for locating OER in their own teaching disciplines we do not see so strong shift. There is not shift in the ability to identify resources for use of primary sources as learning materials in their own teaching disciplines.

Over the workshop there was shift towards OER' competence and we think such exercises should be done regularly.

Comments show informants' intent>

Before workshop:

"Do you really need OER for Ukraine?"

"If you ask me do I know the actually problems of OER I honestly answer: No, I don't see the new way of OER' development. But I am ready to discuss common problems with my colleagues"

"Management of universities must create additional motivation for teaching staff to study OER' issues."

After workshop:

"The collection of negative comments and recommended response to them has to have each teachers who decided to start the WOER. Who has been created it collection? Nobody. The program is the good solution to show the difficulties of the WOER. It is the best lessons for future WOER."

"Not only management of universities, but each teacher must be motivated to WOER ".

Table 4 shows synthesis of the on-the-job training programme "The Work With OER" (objectives, target groups, additional criteria for participation etc.) which proposed by the participants of workshop "Enhanced preparation to WOER".

TABLE 4. ON-THE-JOB TRAINING PROGRAMME "THE WORK WITH OER"

	Before	**After**	**Comment**
Type of programme	Training organized in universities	Training organized in universities or self-learning	The offer of self-learning as fact of the emergence of initiatives and increase accountability for implementation of innovation
Objective	To provide teaching staff with training opportunities to improve level of WOER	To supports staff with training opportunities to have productive experience of WOER	There was a replacement 1)' to provide' was modified 'to supports' 2)' to improve level of WOER' was modified ' to have productive experience'
Target group	Anyone who want and who have not good experience of WOER	All wanting staff (managers, researchers, teachers, librarians etc.)	Expanded range of persons who are included in the Target group
Additional criteria for participation	The teachers who filed application	Staff who decided to improve their own work with OER	
Programme duration	Training of 1-2 months, plus mentor support of minimum 6 month	Training of how need long, plus mentor support when is need	
Type of service providers	Universities through Teachers who are ICT specialists and want to train their college	Who have strong/ good experience of WOER or the expert WOER	Upgraded qualification provider
Additional obligations	Universities are obliged to ensure learning conditions Participants of training are required to present on lessons	Universities are supported to self-learners Participants of training are obliged to share the practices of WOER	1) Focused on the self-learners. 2) The 'obligation to ensure' was modified to 'support'. In fact more partnerships between the University and the teacher. .

The question is how to start the WOER transformed to the question is how to turn situational it work into sustainable or property. The answer of this question relate with the new key role for the teachers. The teacher is not only the participant in the programme to improve the WOER, but is the active participants in their own learning. It is noteworthy that no participants mentioned another provider of training to WOER than universities. In fact teachers do not trust to other educational services' providers, and it is an indicator of insufficient awareness about them. When one participant asked if someone could give an example of such a program, then no one gave examples.

There are some opinions about the program.

"The program must focused not only on preparation of teachers for the role of creator or/and customer by OER, but also to the sustainable future of the OER as a whole and to the image of Ukrainian education as competitive."

"The program must include not only lectures and training by teachers of own university but also webinars, on-line conference by specialists of other universities. "

Conclusion

The difficulties of OER from key informants are completed to deeper understanding to basic of current state of OER in Ukraine. The main challenges for OER in Ukraine are named as regulated infantilism and illusory involvement. Regulated infantilism and illusory involvement are conceptualized to the mechanisms that are distributed across the field of HE and are determined the vision of changes in the modern arsenal of teaching tools. The challenges are embedded in existing problems of HE and in reform in Ukraine.

Challenge 1: regulated infantilism.

Regulated infantilism is mechanism to maintain situation when there is a lack of innovation. It mechanism can be made more visible when need to stifle the initiatives of teaching staff. We found that it mechanism based on inefficiencies existing documents and inefficiencies decisions to promote OER. In addition, the WOER not based on modern standards or rules of teaching but only on own initiatives of teaching staff.

Also professional career does not depend on experience of WOER because a list of teacher' achievements does not contain such indicator. This is a significant finding but it should not be taken as the negative signal.

The establishing of a system to monitor the performance of the WOER could prevent increasing of regulated infantilism. The first step to establish a system to monitor the performance of the WOER is to

identify the WOER's objectives, its target groups, duration, compensation levels, a method to record and update the information, opportunities to generate the all materials.

Next step is to develop performance indicators to measure gross outcomes of work with OER;

These indicators help teaching-staff conduct self-evaluation of WOER and allow managers better managers to better administrate active development of OER.

Challenge 2: illusory involvement (Illusory ownership and illusory partnership are variations)

Illusory involvement is result from the determination of professional advantages as fake. One issue which should be emphasized was surgery ownership. This ownership is based on the aspirations of teachers who are seeking their own professional development and who don't understand the potential benefits of cooperation between different generations. It is difficult for them to implement innovative methods of teaching and change the arsenal of teaching tools.

The big part of the Ukrainian materials from OER (especially those for teachers) must be written in national language and structured so that they are casual and understandable to each teacher.

The biggest repositories of famous universities (for example MIT) might include the materials from Ukrainian universities as their partnership.

"We don't change the stay of English OER. We make the effort to open the experience from Ukrainian teachers " - this *slogan may be the way to* become real participant of future development of OER.

So who are really interested in WOER and involved in this question is very important part of the solution to improve WOER.

Today, the representatives of graduate students are the greatest supporters of OER. The representatives of doctoral candidates also agree with such views. Their views are more compromising towards the professors who are thesis advisors. The doctoral candidates articulate that young colleges need implementation of ICT innovations, even if seniors cannot participate in process because they are not interested in using ICT. However, the professors' values of their own reputation in Ukraine as researchers and as lecturers push them distance themselves from work with OER.

It should be noted that in Ukraine there is no university which has stronger OER that should serve as an examples for other universities. However, these universities, institutions and agencies do not ensure proper coordination and cooperation to meet the needs of the society. Meanwhile, the availability of extensive information about/on the materials/OER from universities is a necessary condition to increase a reliable quality of higher education monitoring. Today Ukrainian universities need the innovative development strategies to ensure that the work with OER is a tangible reality for each student and each teacher.

Generally speaking, higher educational institution's interests to OER by key informants are as follows:

To positive guide development of the higher educational reforms;

To authoritatively articulate openness, transparency, accessibility of education as principles of democratic society and also reflect values of quality education;

To promote uniformity of best teaching practices;

To promote a leadership role for these universities which made famous contribution to development of OER or/and have famous achievement to support of OER.

OER is the modern way to educate, learn and collaborate. But corruption in Ukrainian universities remains a serious obstacle to positive changes in higher education. First of all, each teacher should tackle corruption daily. If the WOER will help to do avoid it then such activity must be immediately implementation.

Major negative from the WOER is possible negative impact to well-being of teaching staff. Also key negative aspects for OER are:

OER as an aim in itself;

OER as an unimportant component for teacher's growth;

OER as only a foreign trend;

OER as one of the variant of modern education.

From the viewpoint of ensuring the effectiveness of WOER it is necessary to reflect and institutionalize the WOER as: efforts of each teacher; the everyday act of professionalization; the index of teacher skill; the reason for/to professional career.

Recommendation

1. Development of national and universities strategies of WOER that is focused on actual need to share knowledge as the real efforts of universities to growth well-being of society as to promote overcoming poverty.

2. Analysis of best practices of foreign or national institutions, synthesis of difficulties in development of OER in Ukraine and coordination of the efforts of all institutions for solution of these problems.

3. Consulting the previous functional reviews and assessment done previously for the AUDIT in order to determine the most efficient and cost-effective personnel structure.

4. Regular AUDIT of WOER by management's bind teaching-staff is not likely an option for higher education development. However, if the management will focus to work with OER at the level of recommendations then it may assist in increasing the attention of teachers to OER's issues.

The document include recommendations which are not obligatory. Probably only small part of the teaching-staff will aware of it. However, it is important that there are management and teachers in Ukraine who realize the importance of support for work with OER.

We think that is necessary to create the special note. The note must offer step-by-step guide to: a) measure the outcomes of work WOER; b) collect data about improving WOER; and c) carry out the preparatory work for conducting net impact evaluations of WOER to promotes overcoming poverty.

Also, to take active steps in the course of increasing the WOER the university's leaders under active facilitation of the Ministry of Education and Science of Ukraine, would establish the Ukrainian Network of OER (UNOER).

The UNOER is determined to support and share an OER's culture in national educational space in accordance with the following tasks:

to shape the community of like-minded and like-acted (community) OER;

to raise interest and understanding on the importance of WOER in wider universities' staff, including entities management and researchers and other staff;

to impact policy-making and guidelines on OER at the university level as well and /as at the level of other institutions and different organization sharing OER's idea (for example NGOs, consulting companies which take non-formal educational services).

We think that realising the full benefits of OER can in practice be more challenging than learning the WOER. The learning of WOER is prerequisite for realising the full benefits of OER.

The WOER is a supportive and inspiring teaching and learning environment. Searching for ways to overcome described challenges, as well as implementation of better world practices and creation of serious national solutions for OER is an especially important task for the Ukrainian system of higher education, each institution, university and each teacher.

References

Avshenyuk, N. 2016. "Priority fields of teachers' professional development in terms of open education worldwide." Comparative Professional Pedagogy.Vol. 4 (6). pp. 15-19.

Bykov, B. 2013. "The Mobile Space and Mobile Targeting Environment for Internet users: Features of Model Submission and Using in Education" Інформаційні технології в освіті (17), pp. 9-37.

CEDOS, http://www.cedos.org.ua/ranking/index?locale=uk, accessed on 30th May 2017.

ICTERI, http://iitlt.gov.ua/eng/info/news/konferents-/icteri-2017/, accessed on 30th May 2017.

Institute of Information Technologies and Learning Tools, http://iitlt.gov.ua/eng/working/result_ndr.php, accessed on 30th May 2017.

Mahony, S. 2016. “Open Education and Open Educational Resources for the Teaching of Classics in the UK“, in: Bodard, G & Romanello, M (Eds.) Digital Classics Outside the Echo-Chamber: Teaching, Knowledge Exchange & Public Engagement, London: Ubiquity Press, pp. 33–50.

Melnik O.M. 2015. “The analysis of basic terms used in a research on a designing of electronic educational resources for educational purpose” / Проблеми освіти, Інститут інноваційних технологій і змісту освіти ,МОН України, 83 (2) pp. 83-87.

National Library of Ukraine, http://www.nbuv.gov.ua/node/125, accessed on 30th May 2017.

Prometheus, https://prometheus.org.ua/ accessed on 30th May 2017.

Repko, Mariya. 2016. “Low Quality, High Expenses: The Real Cost of Higher Education for Ukraine“ 136, JULY 19, 2016 https://voxukraine.org/2016/07/19/education-ua/ Mariya Repko, accessed on 30th May 2017.

Reporting Scientific Conference of the Institute of Information Technologies and learning NAPS Ukraine http://lib.iitta.gov.ua/872/1/tezy_2013.pdf; http://lib.iitta.gov.ua/id/eprint/4534; http://lib.iitta.gov.ua/165919/1/Tezy_conf_IIT%D0%97%D0%9D_2015.docx.PDF;http://lib.iitta.gov.ua/166216/1/Tezy_IITZN_2016.4.PDF, accessed on 30th May 2017.

UNESCO http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/open-educational-resources/, accessed on 30th May 2017.

Vesti, http://vesti-ukr.com/strana/239386-disserhejt-plahiat-v-dissertatsijakh-obojdetsja-ukraine-v-2017-hodu-v-4-milliardnyj-ushcherb, accessed on 30th May 2017.

Zhornova, Olena. 2014. “How self-identity in the field of education promotes poverty reduction: on the possibilities of personality to change lifestyle”, in: Eugen Iordănescu, Irina Bondarevskaya (Eds.) Proceedings of the II International scientific and practical seminar: April, 2014, Sibiu: Editura Universităţii Lucian Blaga", pp. 85-90.

Zhornova, Ol’ha, Zhornova, Olena, 2013. "The Health Of The Nation As An Effect Of The Modern Higher Education: Results of a pilot study," Proceedings HASSACC (HASSACC - Human And Social Sciences at the Common Conference), ISBN: 978-80-554-0808-8, ISSN: 2453-6075, vol. (1), pp. 140-146.

Жорнова О.І. 2013. Міжнародні індекси і рейтинги — для вітчизняної психології: до постановки проблеми // Проблеми політичної психології та її роль у становленні громадянина Української держави. - 2013. - Вип. 14. - С. 281-288. - Режим доступу.

Жорнова О.І. 2014. Драматизм подолання бідності: рух від некомпетентності до компетентності у зміні особистістю стилю життя // Компетентнісний підхід в освіті: теоретичні засади і практика реалізації: матеріали методол. семінару 3 квіт. 20, м.Київ: [у 2 ч.]. Ч.1 / Нац. акад. пед. наук України; [редкол.: В.Г. Кремень (голова), В.І. Луговий (заст. голови), О.І. Ляшенко (заст. голови) та ін.] – К.: Ін-т обдарованої дитини НАПН України, 2014 – С.172-178.

Жорнова О.І. 2015. “Освітня кар’єра особистості: про можливості подолання бідності як стилю життя/Психологічні науки: проблеми і здобутки : зб. наук. ст. / КМУ і ІСПП НАПН України ; [ред. колегія: В. О. Татенко, Н. Д. Абрамян та ін.]. – К. : Київський міжнародний університет, 2015. – Вип. 7 (15). -С. 36-51.

Жорнова О.І., Жорнова О.І. 2013 Методична компетентність викладача ВНЗ : Навчальний посібник. – К.: Інтер-сервіс.

Media and information literacy

MEDIA AND CORRUPTION: POTENTIALS OF NEW MEDIA IN SENSITIZATION

TAMÁS BOKOR

Faculty of Social Sciences and International Relations
Corvinus University of Budapest, Hungary

e-mail of corresponding author: tamas.bokor@uni-corvinus.hu

Key words: new media, corruption, media literacy, gamification

Abstract: Knowledge society presupposes knowledge on our own society's operating mechanisms as well as on 'social games' like corruption.
During the summer of 2016 a representative exploratory research was carried out by Transparency International Hungary on the topic of relations between corruption perceptions and media usage patterns amongst youngsters between 18 and 29 years.
Beside the represented problems about the Y-generation's political indifference, as focus group results showed, young people seclude the minor, petty corruption cases (i.e. everyday bribery, kickback etc.) and organised, politics-related cases (cartels, collusions etc.) in their reasoning. The definition of corruption is applied mostly only to the latter, while everyday cases (resorting of a service without paying taxes, avoiding violation fee with kickbacks etc.) are either win-win situations without any more serious or broader social consequences in youngsters mind-set. Meanwhile, being actors in a corrupted society, awareness of corruption as a means of economic stability in the knowledge society is crucial.
These outcomes in the research warranted further studies on how new media (the most consumed media type of the above mentioned generation) can be improved, which tools might have enough potential to be well-known and well-used for developing sensitivity and consciousness towards social integrity.
A possible resolution for digitalized integrity education is to support two kinds of changes. On the one hand, by raising civic awareness, citizens could be helped by informal open education to recognize that petty everyday corruption is at least as important as the major political issues. On the other hand, a changing language of media news edition as well as a new toolkit in civics education may lead us to take these issues into account more seriously.

Introduction: media shapes interests

"Corruption is what you are excluded from." It seems that we all live in a world where corruption (an unavoidable social phenomena which can be defined as different kinds of abuse of entrusted power for private gains) may well be legal, while practically and judicially illegal corruptive acts can be handled as normal (indeed usual) social practices. Moreover, we all live in a world where mediated communication overwhelms us, and can totally overwrite our (inter)personal experiences. Truism, however it proved to be true several times: our own everyday experiences are interwoven with second-hand information, and their compound shapes people's sights about the world's crucial questions. In our highly mediated world, media has a critical role in shaping peoples' interests – including problems of corruption.

Literature review and theoretical framework: from corruption to gamification

During the last years, various studies have been carried out in the territory of European Union (including Hungary) to examine the possible relations of media and corruption. Perhaps the biggest EU-funded project is the Anticorrp research program with 12 different work packages for revisiting corruption and society (Anticorrp 2016). The currently running, as well as the finished projects are mainly concerned with media representation of corruption (Szántó, Tóth, Varga & Cserpes 2012) or how media ownership's expectations influence the content or create a bias in terms of agenda setting. Not surprisingly, these analyses mostly point out that the political direction of a certain medium actually influences which topics would appear in their agenda, moreover the same can be detected in the field of investigative journalism, even if the direct political control or manipulation cannot be detected. E.g. "The influence on the Hungarian media of some business groups and advertisers is […] notable. A large part of the Hungarian

media is owned by a few entrepreneurs with strong political affiliations, and that may affect the work of these editorial offices. Also, the news outlets often depend on their public and private advertisers. These relations are not conducive to free and unbiased journalism" (Hajdu, Pápay & Tóth 2016, 52.) –we can add: to free and unbiased gathering of information on public life.

Although there are quite a few studies about the relations of media and corruption, it is hard to find studies based on the question of media consumers and attitudes towards corruption, and there seems to be only a few concerns about new media and corruption (Delli 2001; Camaj 2012; Dahlgren 2013).

Beside these, there is a third pillar: the ways how education system can use media to increase sensitivity towards corruption. As Beetham and Sharp (2007, 2) stated round ten years ago: "[A]s – in the West at least – the boundaries are becoming blurred between school and college, formal and informal education, learning for work and learning at work, it also makes sense to consider the continuities across different contexts of learning. How people learn, and how they can best be guided to learn, are no longer concerns that belong behind school gates". Concerning this inevitable truth, anticorruption and pro-integrity trainings, gamified applications and other informal educational tools for reducing corruption broke out of the formal education system. Even more anti-corruption and (after 2011) pro-integrity trainings appeared in the scene, mostly in professional vocational training programmes (e.g. Pallai 2016). These not necessarily use new media toolkit (Petruzzi & Amicucci 2015), but used a gamified process to reveal the hidden mechanisms of corruption.

Elaboration of ethical issues by gamification is a well-searched field (Elena 2015; Kim & Werbach 2016; Sicart 2015) moreover gamification fruitfully contributes to various forms of education (Bokor & Pelle 2015; Idone Cassone 2016; Dichev & Dicheva 2017) even in examination of "social games" (Bishop 2015; Deterding & al. 2015).

Therefore we aimed to reveal the possible connections between the way how media consumers use media, what they consume actually and how they think of corruption, what counts to them as corruption. Based on the outcomes, we took some notes on the potential of new media in developing sensitivity towards corruption.

Methods: a corruption research

During the summer of 2016 a representative exploratory research was carried out by Transparency International Hungary with the contribution of Corvinus University of Budapest (Martin 2016). It aimed to map the relations between corruption perceptions and media usage patterns amongst youngsters between 18 and 29 years. The programme consisted of both qualitative and quantitative methods: on the one hand, Publicus Institute (a Hungarian research centre) carried out a computer assisted telephone inquiry (CATI) with 500 people at this age category, providing a representative set of results in terms of corruption

perceptions. This query, which lasted about 7-8 minutes/person, consisted of three bunch of questions: firstly on actual corruptive cases, secondly general attitude questions in relation to corruption in private and in public life, and thirdly, questions about media consumption habits.

After cross-platforms analysis and evaluation we were able to elaborate a screenplay for the second phase. At this stage, Ph.D. students at Doctoral School of Social Communication, Corvinus University of Budapest helped to organise five focus groups to deepen the examination and reveal the hidden contexts between corruption perception and media use habits. This qualitative method covered the main regions of Hungary, the structural framework was the same in each groups, while the duration of these groups was one and a half hour in each session. (Results were officially presented in August, 2016 in the Sziget Festival, Budapest, with the honouring participation of Coleen Bell, the former US, and Iain Lindsay, the UK Ambassador to Budapest.)

Results: new media rules in public news

By the end of the two stages, we got a five key points to sum up the results.

a. Members of the Y generation in Hungary feel the presence of corruption stronger in political sphere than in their everyday life. However more than half of them have already met corruption personally. It's a pleasure to say that an extremely increasing amount of youngsters declared they would report the corruption cases they experienced to the authorities. In 2012, this ratio was 25%, in 2016 it rose to 66%.

b. 84% of the interviewees claimed that corruption is an unavoidable part of our lives while most of young people also think that it is essential for moving forward in personal career: 71% of them reported that honest people with a high level of integrity have less chance to prosper than their less honest fellows. These two concerns are contradiction of course: due to personal greed or necessity, individuals are reluctant to comply with their reporting obligations, precisely because they would be in a competitive disadvantage compared to their environment.

c. In terms of gathering public news, media usage patterns of the Y generation is based mostly on new media, especially social networking sites. "Queen of living rooms", the television with its 42% nominal frequency can only be second, while radio (12%) and print newspapers (round 10%) are in the end of the media list. Four-tenths of young people do not read a single newspaper, and only one-quarter of them claim to read more than two newspapers regularly. The dominance of online news portals is extremely high among graduated people, but the proportion of newspaper readers in this group is also high.

d. Reading frequency of print media heavily declines amongst 18-29 years old people. Concerning corruption-related news, youngsters are reported to be overwhelmed with big cases

involving hardly imaginable money sums and distant public figures while they have very little deal of knowledge about everyday corruption cases and only a thin reflection on their own corruption involvement.

e. Given that most members of the Y-generation gathers information on public and political life from new media resources (mainly from Facebook's news feed), new media has the biggest influence in terms of representing events and cases relating to corruption, let it be a petty or a big case. A post from news portals is usually read only by its first 2-3 rows, clicking and full-reading is quite rare. The chance for thorough reading of an article heavily increases if the headline is found to be potentially interesting – reported the interviewees.

Discussion: need for sensitization

Although 18-29 year old people have some thoughts and concepts on corruption, the differentiation and detailed information-seeking proved to be difficult.

At one point of the focus groups, participants were asked to set up order among representatives of different professions depending on how much they are subject to corruption. Not surprisingly, minister, parliamentary representative and city mayor took the lead, while repairman, second-hand car-dealer and nurse were settled at the end of the list. Some participants couldn't imagine in what way these latter professionals can be corrupt. (During the reasoning, two main concerns were outlined. Firstly, representatives of professions who are considered the most corrupt, steal public funds for private affairs, while repairmen, nurses, and traders enter into some kinds of mutually beneficial agreements with private individuals. Tax evasion in these cases may only harm a virtual third party, i.e. the state, but the mutual advantage of actors makes small corruption absolutely acceptable. Secondly, as the media mainly deals with major issues of politicians and other public figures, they are considered to be primarily corrupt by citizens.) There is maybe an important potential in gamification methods to help people thinking of corruption in social magnitude instead of a personal level. Many training programmes and teaching materials involve game theory in order to present models how a set of individual misbehaviour for private gains can conclude to collective loss (see e.g. the tragedy of common pastures, peace-war game, volunteer's dilemma etc.). If these are involved into e-learning or social simulation platforms, the multiple players' collective behaviour can be modelled in social magnitude.

In terms of corruption news in media, especially new media, some participants in focus groups claimed: "There is so much happening that we take it natural to happen." In two other groups, similar opinions were put out: "Sometimes I freak out from domestic politics and completely exclude all this kind of news for weeks" and "sometimes I'm so fed up that I can't go near news portals. Another person said: "Ignoring is how we try to rule out reality because we cannot get it." (Martin 2016, 41.) Following this, the second problem of media news is the issue of magnitudes. As a group member said: "I'm afraid there's a

level above which I cannot perceive the difference. I can't judge what the difference between the very big things is". Another added: „A common citizen in his everyday life finds it difficult to separate millions and billions of Forints and Euros. It almost does not matter, and therefore I'm afraid that none of them will take care of corruption." (Ibid.)

Regardless of the types of media, in all kinds of news, be it online or print, participants detected a bias of journalists. According to a comment: "It is hard to believe that someone as a journalist is completely independent of political pressure. And of the pressure of money, because he wants to work continuously at his place." (Ibid., 40.)

All three issues have serious implications. The overwhelming amount of corruption news results in overexposing, and this more or less disables the news value in the long run, pointing out that less is more. It is difficult to grasp the true meaning of large sums of money, hence the importance of corruption cases inflate: after hearing from several serious bribes, cartels and sudden enrichment, we are unable to distinguish. And thirdly, the trust level in journalists seems to be quite low, and it's valid in investigative journalism as well.

As we saw, media users in Y-generation mostly gather their information on public life from social media, especially from Facebook news feed and online news portals. During the conversations in focus groups it turned out that they rarely read the whole articles thoroughly; on the contrary, they mostly just skim the title and lead, and that's enough to decide whether the topic accords to their personal world view and may interest them or not. This resonates to a recent study which claims: "[T]he preferences of the readership […] set some limits on the scope of investigative work. The readers usually prefer short articles that are easy to understand, and what is more, they often just read only the leads of the articles" (Hajdu, Pápay & Tóth 2016, 46.).

Old media will easily collapse in the next years among Y-generation in terms of obtaining information, at least in some parts of the undergraduate population. As we now tend to think, corruption news require longer explanation, some thorough outline of the topic's background. If media can't change the way they presents corruption cases, audience won't be able to see the forest for the tree.

Conclusions: potentials of new media in integrity education

A possible resolution for digitalized integrity education is to support two kinds of changes.

1. On the one hand, by raising civic awareness, citizens could be helped by informal open education to recognize that petty everyday corruption is at least as important as the major political issues. Good practices are presented by Integrity Action which developed a story-based online video game (http://game.integrityaction.org/), helping to recognise good and bad behaviours in different ethical issues. Further examples are provided by

http://www.kongregate.com/games/robproductions/the-corruption, http://msmemorial.if-legends.org/games.htm/corrupt.php, even the Chinese Communist Party launched a "serious game" in order to blast corruption (https://sinosphere.blogs.nytimes.com/2014/01/10/chinese-online-game-offers-chance-to-blast-corruption/?_r=0). These open access online games can only be effectively used and go beyond the stage where users are driven by curiosity to try them out, if they offer a free, user-friendly, familiar and easy-to-use system moreover they can be complied to different kinds of everyday situations.

2. On the other hand, a changing language of media news edition as well as a new toolkit in civics education may lead us to take these issues into account more seriously. As Carpini et al. (2001, 168.) underline: "sex, lies and videotapes" rule the new media politics. Given that understanding of media is the origin of understanding political communication nowadays, and the latter can result in understanding of public life, this warrant the change of media understanding to increase civic awareness. Media literacy development, therefore, is a crucial part of proliferating a new, open-access integrity toolkit in informal education systems. According to the V4 countries' joint media literacy recommendations (Pelle 2016, 236-238.), methodological enrichment and self-education can ultimately lead to a more self-aware society.

In order to maintain a –more or less– wide circle of self-conscious political audience beside the tabloid-oriented, "politically entertained" (potential) voters, we have a great tool in our hands: different types of new media (including online gamification and open education platforms) can enlighten the hidden corruptive mechanisms in simulations, can raise civic awareness towards political and everyday corruption – and at the same time, helps stepping over the extremely personalised political communication.

References

Anticorrp 2016 = Anticorruption Policies Revisited. Online: http://www.anticorrp.eu, accessed on 17th May 2017.

Beetham, H. & Sharp, R. (Eds.) 2007. Rethinking Pedagogy for a Digital Age. Designing and delivering e-learning. London & New York: Routledge.

Bishop, J. 2015. Reducing corruption and protecting privacy in emerging economies: The potential of neuroeconomic gamification and western media regulation in trust building and economic growth. IGI Global.

Bokor, T. & Pelle, V. 2015. "Perspectives of Gamification in Teaching Sustainable Development", in: Beseda J, Machát Z. (Eds.) DisCo2015: From Analog Education to Digital Education. Prague: Center for Higher Education Studies, pp.31-45.

Camaj, L. 2012. “The Media’s Role in Fighting Corruption”. The International Journal of Press/Politics Vol 18, Issue 1, pp. 21-42.

Dahlgren, Peter. 2013. The political web: media, participation and alternative democracy. Basingstoke: Palgrave Macmillan.

Delli Carpini, M. X., & Williams, B. A. 2001. “Let us infotain you: Politics in the new media age“, in: W. L. Bennett & R. M. Entman (Eds.), Mediated politics: Communication in the future of democracy Cambridge, UK; New York: Cambridge University Press., pp.160-181.

Deterding, S., Canossa, A., Harteveld, C., Cooper, S., Nacke, L., & Whitson, J. 2015. “Gamifying research: Strategies, opportunities, challenges, ethics. Conference On Human Factors.”, in: Computing Systems - Proceedings, 18(CHI 2015 - Extended Abstracts Publication of the 33rd Annual CHI Conference on Human Factors in Computing Systems: Crossings), pp. 2421-2424.

Dichev, C., & Dicheva, D. 2017. “Gamifying education: what is known, what is believed and what remains uncertain: a critical review”. International Journal Of Educational Technology In Higher Education, 14(1).

Elena L., I. 2015. “Game as motivation and action in the corruptive social.” Aktual′nye Problemy Èkonomiki I Prava, Vol 9, (4), pp. 96-103.

Hajdu, M., Pápay, B., & Tóth, I.J. 2016. Case studies on corruption involving journalists: Hungary. Corvinus University of Budapest – Anticorrp. Online: http://anticorrp.eu/wp-content/uploads/2016/12/D6.2_Hungary.pdf, accessed on 17th May 2017.

Idone Cassone, V. 2016. “Lude et labora. Notes on gamification at work.” Performance Research, 21(4), pp.101-107.

Kim, T., & Werbach, K. 2016. More than just a game: ethical iss.ues in gamification. Ethics & Information Technology, 18(2), 157.

Martin, J.P. (Ed.) 2016. Korrupcióérzékelés és médiahasználat a magyar fiatalok körében. Budapest: Transparency International Hungary.

Pallai, K. & Gregor, A. 2016. “Assessment of Effectiveness of Public Integrity Work-shops for Civil Servants – a case study”. Teaching Public Administration Journal, pp. 1-23.

Pelle, V. 2016. Developing media literacy in public education. A regional priority in a mediatized age. Budapest: Corvinus University of Budapest. Online: http://portal.uni-corvinus.hu/fileadmin/user_upload/hu/tanszekek/tarsadalomtudomanyi/mki/hajni/V4_publication.pdf, accessed on 17th May 2017.

Petruzzi, V., & Amicucci, M. 2015. “ACT - A new game-based methodology for Anti-Corruption training”. Journal Of E-Learning And Knowledge Society, 11(3), pp.59-71.

Sicart (Vila), M. A. 2015. “Playing the good life: Gamification and ethics”, in: S. Waltz, & S. Deterding (Eds.), The Gameful World: Approaches, Issues, Applications , MIT Press, pp. 225-244.

Szántó, Z., Tóth, I. J., Varga, Sz., & Cserpes, T. 2012. “Korrupciógyanús esetek médiareprezentációja Magyarországon (2001-2009)”, in: Szántó, Z., Tóth, I. J., & Varga, Sz. (Eds.) A (kenő)pénz nem boldogít? Gazdaságszociológiai és politikai gazdaságtani elemzések a magyarországi korrupcióról. Budapest: Corvinus University of Budapest, pp. 39-57.

MEDIA LITERACY OF A CHILD AT AN EARLY SCHOOL AGE FROM THE PERSPECTIVE OF TEACHERS, PARENTS AND PERSONS PREPARING TO BECOME EDUCATORS

MONIKA FRANIA
WIOLETTA HADZIK

Faculty of Pedagogy and Psychology
University of Silesia in Katowice, Poland

e-mail of corresponding author: monika.frania@us.edu.pl

Key words: Early Education, Media Literacy Education (MLE), parents, students, teachers

Abstract: Forming digital media competences and media contents awareness should start from the young age. Only carefully designed and comprehensive actions give a chance for growth of responsible members of the information society. Media education takes place in the family, school and other environments in which children operate.
The aim of the qualitative and quantitative scientific explorations was to survey professionally active teachers, people preparing for taking up the profession of a teacher and parents, about media education in the early education process. 120 students of the University of Silesia (Poland) and Teacher Training College of Bytom (Poland) took part in the survey, as well as 32 early education teachers. 12 parents of children at the age of 6-8 took part in the interview.
80% of the respondents (N=152) who were surveyed believe that media education should be mandatory in the process of early education, at the same time both students (3,4 in the 5-point scale) and professionally active teachers (3,7) assessed its significance rather low. 88% of the surveyed teachers incorporate the elements of media education in their work. In the case of apprentice teachers – 65% of them want to implement those elements in the future. Teachers who were asked to provide a self-assessment, assessed their media competences and knowledge about media as good, while students assessed them as average. The section evaluating knowledge of the respondents revealed a diversified level of information held. The surveyed parents have a relatively low knowledge, at the same time in the interviews they present high expectations towards the school MLE.
The approach to the media literacy produces a practical pursuit to its accomplishment. The study was designed to show opinions of representatives of three environments that have a genuine influence – or will have one in the future – on the form of actions in this regard aimed at young learners.

Introduction

A member of a dynamically developing knowledge society is a person who has been aware for a long time that the space of contemporary life has been filled by media and new technologies for good. Regardless of the age, the interaction with media as well as mediated communication has become an everyday reality. The question regarding media literacy and media education is constantly valid in the light of a dynamically developing media civilisation.

The purpose of media literacy is to counteract the mechanisms of media and digital exclusion of persons who do not have relevant competences and thus are media illiterate in the mediatised, networked world. The role of media literacy is also to remove the differences in users' competences by increasing the level of knowledge and competences of excluded persons and thus make them fully and actively function in the society again (Ogonowska 2013, 10). Furthermore, the purpose is not only to incorporate the excluded persons, but to develop these competences throughout the entire life, shape a conscious, open and critical attitude characterising all media users.

Education actions regarding media literacy, as in the case of other sub-disciplines, may be organised in several ways. The following activities may be distinguished:

- formal – within institutions such as e.g. schools, universities, teacher training centres, by including media literacy in the curriculum;

- informal – within other educational or cultural institutions;

- accidental – contact with education without formalised or organised actions, e.g. at home during everyday activities (Muszyński and Stunża 2011).

The task faced by media educators was metaphorically described in Polish literature by Tomasz Goban-Klas. In his opinion, the users of new media should not surrender to the trend of "surfing the internet", they should rather learn to "navigate the network". His words were supported by the following description "surfing is a magnificent sport where one slides on the waves on a board, while navigating is a sea voyage with a designated purpose, requiring one to master the navigating art and using the instruments (compasses, maps) and knowledge" (Goban-Klas 2005, 257). This is what using media should be like – it should be intentional and rational. When analysing the media resources available today – their multiplicity and quality diversity – a competent selection consistent with the assumed outcome is crucial.

This process applies to each user and is quite widely discussed both theoretically in the ideas of such researchers as Bronisław Siemieniecki, Maciej Tanaś, Stanisław Juszczyk, Wacław Strykowski, Janusz Gajda, Marek Sokołowski, Adam Lepa and others, as well as practically in literature and studies on the national/Polish level (see, for instance, Murawska-Najmiec 2015; "Wnioski i rekomendacje... 2014"; Morbitzer 2012; Lipszyc (ed. 2012; Frania 2012, Drzewiecki 2010) and the international level (see, for instance, Pelle 2016; Alexander 2016). However, from the point of view of this article, the object of interest was only a fragment of the topic, namely the media literacy of early-school children in the local environment of southern Poland.

With regard to the essence of pedagogy, media literacy has developed its own objectives constituting an essential element of the teaching practice, and it thus requires knowledge not only from the recipient, the child in this case, but also from the child's parents, supervisors, teachers, everyone who participates in the child's upbringing (Bis 2009, 51). We, as the authors, accept the fact that the opinions of these persons, their knowledge, competences and the awareness of the needs or their lack actually affect the practical execution of media literacy, for instance, at school and in the family.

Outline of the author's methodological own research

Entities initiating the process of implementing media literacy or the strategy of deepening the media awareness and competences among early-school children are extremely important, as we tried to demonstrate above.

The purpose of the conducted quantitative-qualitative research was to examine the opinions of active teachers, persons preparing to become teachers as well as parents on the importance of media literacy in early school education[*].

Formulating the research problems makes it possible to arrange the scientific explorations and refer them to the designed objective. The research problems, formulated in the form of questions regarding a fragment of the research presented in this article, relate to three groups of examined persons. They should be particularised as follows:

- What is the attitude of professionally active early school education teachers towards media literacy?
- What is the attitude of persons preparing to become early school education educators and teachers towards media literacy?
- What is the attitude of parents of early-school children towards media literacy?

When searching for the answers to the formulated research problems in the exploration process, we adopted a scheme of the primacy of the research method in relation to more detailed terms: "research technique" and "research tool". A diagnostic survey was the method, a survey was the technique, and a survey questionnaire was the research tool. It included both open questions – asking for subjective opinions and closed questions – with a selection of answers, introducing the proper question, as well as questions with a scale of estimates (Rubacha 2008, 173-175). The survey questionnaire was created in two versions. One of them was intended for the students of pedagogy of the first and second degree (who prepare to become educators, teachers, teachers of initial classes), while the second one was addressed to professionally active early school education teachers. The questionnaire for teachers consisted of eleven questions. Six questions were closed questions, only one of them was a multiple-choice question. One of the closed questions was expanded with the possibility to present a subjective statement, a short justification of one's choice (it thus contains the features of an open question). The questionnaire also included four questions with a scale of estimates. The questionnaire for students contained the same set of questions, but they were adequately adapted to the group of the respondents. According to the division of surveys used in the social research taking into account the distribution method, the author's own tools are classified as background surveys. This type applies to questionnaires which are distributed directly by the

[*] The research presented in this article regarding the opinions of teachers and students is a fragment of the diploma paper by Wioletta Hadzik entitled "Stosunek do edukacji medialnej studentów pedagogiki i aktywnych zawodowo nauczycieli zintegrowanej edukacji wczesnoszkolnej" [Attitude to media literacy from the students of pedagogy and professionally active integrated early-school education teachers], prepared under the supervision of dr Monika Frania in 2015 at the Faculty of Pedagogy and Psychology at the University of Silesia in Katowice. The research results used are a fragment of explorations and have not been published previously.
The research conducted among the parents to whom this article refers is not part of the above the diploma paper.

researcher in a given environment (Sztumski 1999, 114). In the case of the described research, this is the environment of employees of primary schools and university students.

Additionally, an interview was conducted among the parents of early-school children with the use of the questionnaire. The interview was open, oral and concerned opinions on media literacy in aspects raised in the other tools. It contained eight open questions.

The research sample in explorations covered intentionally selected representatives of three populations: students of pedagogy at two Polish universities in Silesia, teachers at primary schools ~~in Silesia~~ as well as parents of early-school children. The first group of the respondents were students from the University of Silesia in Katowice (Poland) as well as the Teachers' College in Bytom (Poland). 120 students participated in the research. 80 students of the first degree – the bachelor degree, including 48 students of the 2nd grade and 32 students of the 3rd grade. All of them were full-time students. There were 40 students of the second degree – the master's degree, including 32 students of the 1st grade of full-time studies and 8 students of the 2nd grade of extra-mural studies. The questionnaires were completed by 119 women and one man. Students of the University of Silesia were the majority of the respondents – 83% (100). They included students of the 2nd and the 3rd grade of bachelor's studies as well as students of the 1st and the 2nd grade of master's complementary studies. This university is one of the largest universities in Poland, and it has a 40-year old tradition. It consists of 12 faculties, almost 70 programmes and more than 200 specialisations. Currently, it educates approximately 35,000 students (www.us.edu.pl). This university is located in Katowice, which is the 10th biggest city in Poland in terms of size, it occupies 164.5 km^2, and is inhabited by 325,000 people. Katowice belongs to a unique space on the European scale referred to as the Silesian Agglomeration. It is also the capital city of the Silesian Province (website katowice.pl 2015). In turn, students from the Teachers' College in Bytom constituted only 17% (20). This group of the respondents included only women, students of the 3rd grade of bachelor's studies. The Teachers' College was established in 1992 and is a public teacher training centre. It educates in the full-time system – 6 specialisations, as well as in the extramural system – 3 specialisations, but only in the first degree (www.kolegiumbytom.pl).

The teachers are the second group of the respondents. The research covered 32 women teachers at various stages of their professional development: 5 teacher trainees, 8 contract teachers, 5 appointed teachers and 13 certified teachers. The least experienced respondent has not even worked for a year, while the longest working teacher has worked for more than 33 years. The majority of the respondents, 11 of them, work in Katowice. They are more than 1/3 of the respondents from the teachers' group.

The questionnaire interview involved 12 parents of 1-3 grade children from the Silesian Province, including from the capital city – Katowice, and from the neighbouring cities. The majority of them, 9

respondents, are mothers. Only in two cases the parent participating in the research had more than one early-school child.

Since the presented research was of a slightly wider nature, the subsequent section will present only the most important results.

Opinion on media literacy by active teachers and persons trained to become teachers

This passage refers to the results of explorations among professionally active early school education teachers as well as among pedagogy students preparing to become teachers. The selected research results obtained in the diagnostic survey are presented below with regard to three selected aspects:

a) opinions on the importance of media literacy in early school education and the presence in school education; recommendations from entities responsible for media education;

b) the implementation of media literacy during practical classes;

c) self-assessment of media competences and knowledge about the media.

As far as the first aspect is concerned, the students were almost unanimous, as many as 80% (96) of them answered that media literacy should be obligatorily implemented at school. Only 20% (24) of persons were of the opposite opinion. The teachers' answers are similar to the students' opinions. 78% (25) of the respondents opted for the obligation to implement media literacy. 22% (7) were against, which is as many as 1/5 of the respondents. When it comes to the aspect related to separating media literacy as a separate subject, the students' opinions were diverse. 41% (39) of them believe that it should be implemented as a separate area, while 59% (56) of them are of a different opinion and they are a slight majority. When it comes to the teachers, the difference is visible again. Only 32% (8) of the teachers said "yes", while 68% (17) of them answered "no".

The above results show that media literacy, both in the opinion of students and teachers, should be obligatorily implemented in early school education. However, it is not necessary to introduce it as a separate subject at school. This may be examined in two ways. First, professionally active early school education teachers often complain that they have too much on their shoulders, the curriculum is overloaded, and there is too little time to pursue it. Students preparing to become teachers are also aware of the reality of the Polish education. It may be suspected that the fear against more and more duties contributed to such answers from the respondents. However, introducing a separate subject related to media literacy would enable the implementation of the curriculum. This would involve specific guidelines which would limit the problem with choosing relevant content, issues adequate for early-school children, as well as such topics which would have a practical application. The conducted explorations also indicated a conflict in the examined groups. 80% of the respondents (N=152) taking part in the questionnaire believe

that media literacy should be mandatory in initial teaching, while both students (3.4 on a five-grade scale) and professionally active teachers (3.7 on a five-grade scale) assessed its importance as rather low.

The entity responsible for this task is a very important aspect in actions for media literacy. Therefore, the following question becomes crucial: who should educate the youngest in this field?

As much as 89% (107) of students stated that this task should be entrusted to the school. They also assigned an important role in the teaching process to the family – 63% (75). The media ranked at the 3rd place – 25% (31). The lowest number of answers indicated the role of peers – 10% (12). One person chose the answer "others" (this person believes that media literacy should be taught by outsiders, not connected with the media).

The school is also the most important institution in the introduction to media literacy according to active teachers, such response was selected by 91% (29) of them. As in the case of students, they also assigned great significance to the family – 84% (27). However, the percentage difference is definitely smaller here. When it comes to the media, we may again a great convergence of answers. The media obtained 28% (8) of the teachers' answers, namely only two percent less than in the students' case. The peers were again ranked last – 6% (2).

The research thus showed that the responsibility for implanting the grounds of media literacy should be divided between the teachers, or the school in a wider perspective, and the family. These are the two basic environments of a child at this stage of development. Family as the first environment with which the child is in contact should implant the grounds which may then be continued by the school in the future. The question regarding the parents' level of knowledge and awareness in this respect remains open.

When analysing the media literacy from various aspects it is also worth focusing on its practical execution. Information included in the core curriculum indicates that it should be implemented at the stage of initial education and in future education. Prior results showed that it is important in the awareness of the respondents and it should be implemented but how does this compare to the actual situation? Persons preparing to become educators, teachers, were asked about their plans related to the implementation of media literacy in their future professional work. The largest number of the respondents, as many as 65% (78), stated that they would use these elements in their classes. Only 7% (8) do not plan such activities. 28% (34) of students claim that they have not thought about it yet. It is worrying that so many students have never thought about the implementation of media literacy elements in their future work.

The teachers were asked the same question, but they were not asked about plans but about implementation. Almost all the teachers, 88% (28), answered that they used media literacy elements in their work. Only 12% (4) gave a negative answer. The negative answers may result from several factors:

- the teachers' ignorance and fear of conducting classes in a field they do not know;

- the lack of knowledge of the core curriculum, or its incorrect interpretation;
- the lack of willingness to conduct classes, professional burnout;
- the lack of willingness to develop, to learn about a relatively young field.

When comparing the answers of teachers and students, we may see that the vast majority either implement media literacy elements or plan to use them in their future professional career. In the question regarding the frequency of actions in this field – the majority of teachers – 57% (16) – chose the answer "once a week". 25% (7) of them answered "once a month". Only one teacher admitted that he used its elements less frequently than once every quarter. 14% (4), namely the remaining teachers, use media literacy more often than once a week. The answer "every quarter" was not chosen.

It is beyond doubt that knowledge in a given field is necessary to be able to conduct classes in that field in a reliable manner. Additionally, one's knowledge should be continuously widened and updated in such a dynamic field. Media competences in the research were understood as knowledge and analysis of media phenomena, evaluation and the ability to use the media as well as the combination of these aspects in a harmonious manner (Bednarek 2012, 105). The respondents were asked to self-assess themselves in the scale from 1 (insufficiently) to 5 (very well). When answering, the respondents could choose non-full grades, for instance 3.5. Respondents from the group of students assessed their own level of media competences as moderately high. The majority of them, 39% (47), graded themselves as sufficient (3). In turn, 29% (35) of the examined graded themselves as good (4). There were also extreme grades. 4% (5) graded themselves as insufficient (1), and only 9% (10) graded themselves the best – very good (5). With regard to the self-assessment of the level of knowledge with regard to the media, the largest number of students graded themselves 3 (sufficient) – 38% (46) and 4 (good) – 33% (40). The same number of the respondents graded themselves 2.5 and 3.5 – 3% (4). The lowest number of students indicated the grade 4.5 and 1 – 2% (2), and no one chose the grade 1.5. 7% (8) chose the highest grade – very good. The results show that the majority of the students have in their own opinion at least basic knowledge in a specified field.

The teachers also assessed their level of knowledge on the media. The lowest chosen grade is 2, indicated by 6% (2) of the respondents. 22% (7) of the respondents chose 3 (sufficient), 4 (good) – 38% (12) and the highest grade – 5 (very good) was chosen by 28% (9). There were also such grades as 3.5 and 4.5 which were chosen by 3% (1).

The aspect of the relation between the level of competence and knowledge about the media and programmes preparing teachers for the profession was interesting from the point of view of these explorations. When analysing the answers given by university students and their current subjective assessment of preparation they owe to various classes in the curriculum, it is worth starting from the

comparison of limit grades. It is alarming that only 2% (3) of the students decided to choose the 5th grade in the scale when as many as 12% (14) chose the 1st grade. The largest number of the respondents – 33% (40) answered 3, and almost as many – 26% (31) – chose the 2nd grade. Grade 4 was chosen by 18% (21). The average grade from the students is only 2.7, which would not even be enough to pass a test from a demanding lecturer. The fault may be seen in the insufficient preparation of classes at the university, which would enable the students to appropriately prepare to conduct classes in this field. The programme of classes does not include the subject media literacy as an obligatory one, and the classes including its elements are not comprehensive in terms of the topic, they are held during the last year of the studies, or are too general. It may also be presumed that the students incompetently draw conclusions from the classes and thus feel unprepared. What were the answers from the students regarding the participation of other forms of education in their preparation to conduct classes related to media literacy? The majority of students – 55% (65) – denied any other influence on their preparation. The remaining 46% (55) claimed that they tried to raise their competences.

The teachers indicate other forms of searching for knowledge regarding media literacy. The educators most often pointed out self-education – 75% (24) and workshops – 50% (16). However, participation in other forms in their case is definitely more frequent. Training courses were selected by 44% (14), courses – 34% (11), and Internet courses – by 25% (8). The answer "scientific conferences" was chosen by the smallest number of times – only 13% (4). 6% (2) of the teachers also chose the answer "other", in which they indicated – "adult children" and "studies".

Opinion on media literacy by the parents of early-school children

The family is an important pillar in activities preparing the child to live in the knowledge society. The parents are the first persons who have the possibility to deepen the media competences of their children. They teach the young how to interact with media messages, information and new technologies. It may be assumed that their opinions on the essence, the need or the lack of media literacy will determine their more or less impressive functioning. 9 mothers and 3 fathers of children in the initial classes were asked about these aspects in an interview. The obtained results are presented below in the form of a collective summary according to the adopted categories:

a) what is media literacy and media-digital literacy; is shaping media competences and the conscious reception of messages important in the context of early-school children;

b) who and how should educate the children in terms of the media; what is the role of particular environments of the child's development in actions related to increasing media literacy

c) does the parent feel competent in terms of media literacy; how does the parent assess his knowledge and competences in this matter.

The majority of the examined parents provided correct but intuitive answers in the first criterion. These were not definitions from the literature on the subject, which should not be surprising, but rather descriptive observations. One of the fathers incorrectly identified media literacy with the operation of devices, technologies and actions related to computer science.

In the opinion of the respondents, the conscious receipt of media messages was related, first of all, to electronic media, e.g. animated movies on TV or computer games, while magazines or newspapers were referred to much less frequently.

In ten out of twelve cases the parents appreciated the weight of actions related to media literacy in terms of the youngest children.

Example of a statement in aspect a):

- *"It is important to teach children that the media may manipulate, that one may find both the truth and lies in the media. This applies to all elements, also animated movies on TV. One thus needs to talk to the child from the earliest years about the media. Together with my husband we're trying to talk to Antoś about such topics and we don't leave him in front of the TV set alone".*

  [„Ważne jest nauczenie dzieci, że media mogą manipulować, że można tam znaleźć zarówno prawdę, jak i kłamstwa. Dotyczy to wszystkich elementów, także bajek w telewizji. Trzeba więc zaczynać rozmawiać o tym z dzieckiem od najmłodszych lat. Razem z mężem staramy się rozmawiać z Antosiem na takie tematy i nie pozostawiać go samego przed ekranem telewizora"].

The parents indicate, first of all, the school (in eight cases this was definitely the first indication), and then themselves (the family is the second most frequent indication) as the main entity which should be responsible for media literacy in the second category. No other proposals were indicated in the interviews. The parents did not indicate the media themselves, the peers, non-governmental organisations etc. Many statements emphasised the school's institutional tasks in this respect, referring to the teachers' competences (as compared to the poor self-assessment of their own competences in several cases) Some of the respondents believe that such actions are conducted at school. The request often appeared as a demand.

Example of a statement in aspect b):

- *"We at home control Ania and we're trying, for instance, to limit her access to TV or the computer. We sometimes talk to her about what she saw, but it is the school that should teach the children about the media, manipulations and threats. The teachers know all the novelties better than we do, although nowadays the children know how to use various devices. The teachers should pay greater attention to this topic".*

[„My w domu kontrolujemy Anię i staramy się na przykład ograniczać jej dostęp do telewizji czy komputera. Czasami z nią rozmawiamy o tym co widziała, ale to szkoła powinna uczyć dzieci o mediach, o manipulacjach i niebezpieczeństwach. Nauczyciele znają wszystkie nowinki lepiej niż my, choć w dzisiejszych czasach to dzieci same wiedzą jak używać różnych sprzętów. Nauczycielki powinny zwrócić na ten temat większą uwagę"].

Answers in the third category were diverse. The self-assessment of one's own knowledge and competences was a difficult task for the parents. Four persons (three mothers and one father) assessed their competences very highly. The remaining respondents had great difficulties in this case and the majority of them referred to the help of the teachers or the school as an institution.

Example of a statement in aspect c):

- *"Yes, I assess my knowledge in this respect as high. We're good in this respect and our daughter hasn't had any problems so far".*
- *"It's difficult for me to say whether I fulfil my tasks related to media literacy when it comes to Amelka. We try to talk to her with my husband, but I don't know if my knowledge is great. I try to be up to date with the novelties, teach my daughter what and how she may use, what websites to browse. However, classes at school about safety in the media would be a very good idea. I think so".*

  [„Tak, oceniam swoją wiedzę w tym zakresie jako wysoką. Dobrze sobie radzimy w tym zakresie i raczej nie pojawiły się żadne problemy do tej pory u córki"].

  [„Trudno mi powiedzieć, czy wypełniam zadania związane z edukacją medialną w stosunku do Amelki. Staramy się z mężem z nią rozmawiać, ale nie wiem czy moja wiedza jest duża. Staram się śledzić nowinki, uczyć córkę co i w jaki sposób może wykorzystywać, na jakie strony zaglądać. Zajęcia w szkole o bezpieczeństwie w mediach bardzo by się jednak przydały. Tak myślę"].

Conclusion

According to the respondents, media literacy should be obligatorily included in the teaching process at the early-school age. It should be introduced, first of all, by the school with the support from the family environment. However, the majority of the respondents do not notice the need to introduce it as a separate area.

The details of classes related to media literacy in the core curriculum thus remain a request for the future. The publication of the objectives and the amount of teaching hours would not only facilitate the implementation, but would also be an obligation to be regular. Perhaps, it would be an answer to the teachers' uncertainty and the need formulated by the parents.

In addition, the significance the respondents attach to media literacy on a five-grade scale is 3.55 on average. It may be assumed that such low significance, with the simultaneous belief that it should be obligatorily implemented, results from the lack of a clear relation to this field of pedagogy. This, in turn, may be associated with the fact that media literacy is a new area which is either still unknown, or changes in this area are so dynamic that it is difficult to catch up with them.

According to the examined teachers, media literacy is implemented by them in the initial classes of the primary school, most often once week, and the students plan to follow this route. The self-assessment of the level of knowledge regarding media literacy among the students is not satisfactory. The need to expand the preparation in this field is visible because self-education and classes conducted at universities will not bring the expected results. The teachers and the students need to be sure that the knowledge they have is sufficient so that they are able to pass this knowledge to subsequent generations. The majority of them are willing to expand their scope of knowledge. Taking into account the research results, the students' preparation in terms of media literacy should be expanded, either by creating a new subject, or by discussing it in more detail during classes and lectures. Such actions could be the beginning of groundwork in order to educate a professional and competent teaching staff in the near future.

This seems particularly important in the light of the expectations of parents of early-school children who emphasise the great role of the school in this matter, who see the need to cooperate with the teachers and who expect assistance from the educators in this respect.

Taking into account the regularities of the research process in humanities and social studies, the obtained results should not be generalised on the entire population. The explorations rather supplement the view of the present status of contemporary media literacy in Poland. This is a voice in a discussion which may also be a guideline for pedagogical and teaching practice.

References

Alexander, B., 2016. "Instructional Strategies for Analyzing Media Literacy in the Classroom", Society for Information Technology & Teacher Education International Conference, Vol. 2016, No. 1.

Bednarek, J., 2012. „Nowe kompetencje medialne społeczeństwa wiedzy", in: Skrzydlewski, W., Dylak, S., (Eds.), Media edukacja kultura: W stronę edukacji medialnej, Poznań – Rzeszów.

Bis, T., 2009. „Edukacja medialna wyzwaniem dla współczesnej szkoły", in: Kozieja, S., (Ed.), Szkoła w perspektywie XXI wieku. Teraźniejszość – przyszłość, cz.2: Nowe technologie i perspektywa przemian w procesach edukacyjnych, Kielce.

Drzewiecki, P., 2010. MEDIA AKTYWNI Dlaczego i jak uczyć edukacji medialnej? Otwock – Warszawa, http://presscafe.eu/images/MediaAktywni.pdf, accessed on 10.05.2016.

Frania, M., 2012. „Znaczenie szkolnej edukacji medialnej w kontekście rozwoju społeczeństwa opartego na wiedzy", „ Chowanna'', Vol.2, Katowice, pp. 301-312.

Goban – Klas, T., 2005. Cywilizacja medialna: Geneza, ewolucja, eksplozja, Warszawa. http://www.kolegiumbytom.pl/index.php?option=com_content&task=view&id=10&Itemid=13, accessed on 8th March 2015.

http://www.portal.katowice.pl/katowice_opis_miasto.php, accessed on 28th March 015.

http://www.us.edu.pl/node/42571, accessed on 8th March 2015.

Lipszyc, J., (Ed.). 2012. Cyfrowa Przyszłość. Edukacja medialna i informacyjna w Polsce – raport otwarcia. Fundacja Nowoczesna Polska. Online: https://nowoczesnapolska.org.pl/wp-content/uploads/2012/01/Raport-Cyfrowa-Przyszłość-.pdf, accessed on 1st April 2017.

Morbitzer, J., 2012. Medialność a sprawność edukacyjna ucznia, http://www.ktime.up.krakow.pl/symp2012/referaty_2012_10/morbitz.pdf, accessed on 10th May 2016.

Murawska-Najmiec, E., 2015. "Edukacja medialna w Polsce: krajowe podejście instytucjonalne w kontekście polityki europejskiej oraz dorobku społeczności oraz organizacji pozarządowych", in: Fedorowicz, M., Ratajski, S., (Eds.), O potrzebie edukacji medialnej w Polsce, Warszawa.

Muszyński, D., Stunża, G.D., 2011. "Co to jest edukacja medialna?", Narodowy Instytut Audiowizualny, http://www.nina.gov.pl/edukacja/artykul/2011/09/06/co-to-jest-edukacja-medialna-, accessed on 6th February 2014.

Ogonowska, A., 2013. Edukacja medialna – klucz do zrozumienia społecznej rzeczywistości, Kraków.

Pelle, V., (Ed.), 2016. Developing Media Literacy in Public Education. A Regional Priority in a Mediatized Age, Budapest.

Rubacha, K., 2008. Metodologia badań nad edukacją, Warszawa.

Sztumski, J., 1999. Wstęp do metod i technik badań społecznych, Katowice.

Wnioski i rekomendacje po I Kongresie Edukacji Medialnej zorganizowanym przez Polskie Towarzystwo Edukacji Medialnej PTEM w 2014 roku. (2014), http://ptem.org.pl/wnioski-i-rekomendacje-po-i-kongresie-edukacji-medialnej/, accessed on 10th May.2016.

INNOVATION OF THE COURSES OF INFORMATION LITERACY AS A WAY FOR OPENNESS, PERSONIFICATION AND COMPETENCIES

MICHAL ČERNÝ

Faculty of Arts
Masaryk University, Czech

e-mail of corresponding author: m.cerny@phil.muni.cz

Key words: Information Literacy, MOOC, e-learning, OER, nonlinear learning

Implementation of massive open online courses in the university environment is still widely debated topic. Whether it involves activities that universities targeted towards the general public, for example through EDX courser or Udacity. Or conversely courses that are designed to satisfy demand within the institution, but are realized through e-learning. We can discuss on the form, content, but also the meaningfulness and effectiveness of individual activities.

In this paper we focus - form of case study - one of two courses of innovation that tries to combine classical university courses with openness to the public. We will attempt to describe the motivations, challenges and interesting aspects of the feedback received, which relate to both courses.

The first is the Information Literacy Course that is newly built on a web-based and open to the public without restriction, offering the possibility of studying nonlinear. It is based on text materials and skills development. Course at university normally has between 500 - 1400 students and is an introduction to information work, making professional text or information searching. Although it is fully e-learning is based on pragmatic education. Paper presents basic information about the course evaluation by students and attempts a comparison with previous years, when it was a classic course in LMS IS MU and was closed.

The second course, which is also innovative and open (for any interested person) is Creative Work with Information, which studying about 200 to 300 students each year. The course was developed in collaboration with NOSTIS, on whose platform running. It focuses on creative thinking and work with information through unconventional ways (with the support of technology). Format partly follows the usual MOOC - offers peer assessment of the ongoing tasks, study materials are in the form of video and PDF text support. Originally, it was also a common course located in the LMS, standing on tutor repaired tasks and texts. Now he can besides students of Masaryk University also frequented by the public. The paper will perform a critical analysis of the changes made

Introduction

Information education in a university environment is undoubtedly one of the topics that are both vividly discussed and actively addressed in a specialized forum such as IVIG. We do not want to open a debate here about who should be the guarantor of information education at university or about the obligation or facultative nature of such education.

On the contrary, we would like to pay attention to the format of such educational content if it is processed in the form of e-learning. Whatever we try to work on with more general theories and concepts, we would like to take our reflections on two courses that are being implemented at KISK (Department of Information Studies and Librarianship) in the academic year 2016/2017. We do not have the ambition to offer the only right solution, but we believe that the two courses we mention will saturate some of the problems that have emerged in previous forms of distance development of information literacy. From this point of view, we believe that the contribution can be an interesting stimulus to discuss how to do this information education or not to do it at its own university workplace.

Default situation

Information education at Masaryk University is realized by a relatively wide range of activities, including both presenter courses and courses of faculty libraries as well as online educational activities. Nevertheless, the pair of KPI11 (Information Literacy Course) and KPI22 (Creative Work with

Information) courses are crucial within the university, both in range and the number of students studying across faculties, as well as in the scope and structure of both projects.

KPI11 is a basic course of information literacy, which is based on the problem of creating text and other competencies that students need for successful accommodation in the academic environment. The traditional target group of the course is students of the first year of bachelor study or those who write their first qualifying work. In this respect, the course is actually academic propedeutics, which also creates a specific view of what is the role of information literacy, or how it is treated with it. It is not a new course, it is taught since spring semester 2006, since 2012 has been moved to the autumn semester (Chytková 2011). The number of students is oscillating from about 600 (autumn 2016) to about 1400 (autumn 2013). It is therefore a course with a relatively significant impact in terms of the number of students.

The course has undergone a major innovation change in 2016 in the context of the CEINVE project (Zadražilová 2012, 34-39) when it has changed both in terms of content (significant refinement of the search for information and the enhancement of the topics related to their analysis and creation), thus formally - learning materials, tests and the end of the course. Gradually added videos (2014) or audio stories accentuating the narrative level of the course (2015).

The course took place all the time in the IS MU environment, which allows relatively simple management of the number of students and their tasks or testing. In terms of content delivery, an interactive layout was used that allows for basic HTML formatting. Learning materials consisted of PDF files. (Černý, Chytková, Mazáčová, Šimková 2014, 65-72) The emphasis on this concept was at a certain level of school - defining educational goals, learning and testing, including a summary of each module or a self-test option. In this respect, the whole course was based on a somewhat cognitive paradigm with constructivist elements (Siemens 2014, Kop 2088), which manifested itself in the partial tasks and especially in the creatively conceived final work. Some limitations of cognitive functions have been achieved by introducing webinars, trying to use Facebook for communication and other elements that have led to greater interaction between students and teachers, so that ultimately it was possible to talk about the predominant constructivist concept.

Otherwise, creative work with information is taught from 2010, originally in autumn 2012 in the spring semester. From the beginning it is conceived as a smaller (for a maximum of about 300 students), which tries to emphasize creative thinking and its development in relation to information. He was originally conceived as a constructivist, except for the IS, he also uses Facebook to share interesting information; He even had a blog on Posterous, but ended up with the end of the app. The study materials were from the beginning mostly text, sometimes supplemented by video. At the time of the CEINVE project, the course

was combined with the participation of seminars, where various techniques and themes were presented. (Mazáčová 2013)

Motivation for innovation

From the above, the basic motivational framework for implementing the fundamental innovations in the two courses described above is evident. In either case, it is a change or at least a rewrite of the basic paradigmatic framework on which we are based, or the identification of a pedagogical school - for example, changes in the KPI11 course are based on Dewey's pragmatic pedagogy (Kadlec 2007; Šíp 2016, 134-151; Dewey 1992). This grasp of the pedagogical framework is something that is not done at many e-learning courses, or is governed by "traffi" handbooks and intuitions. We think that a thought-based thinking base can be the key to doing better, logically more sophisticated courses that will have a consistent character. One of the motivations for change was the loss of consistency of the courses, which was associated with their gradual expansion, adaptation and replenishment. Gradually, the individual elements, but neither the language nor the overall ideological framework of the course, created the impression of complexity and clear delimitation.

The second problem was the over-schooling of both courses, which was largely related to IS MU's e-learning environment, which is visually unpleasant and too linear. Learning materials in PDF format were a textbook impression. We were not completely satisfied with that. We believe that learning - especially in the field of information work - should respect the information behavior and students' environment, not to be extravagant, sterile and too theoretical. This requirement does not reduce the demands on students or the difficulty of the whole study, but to a great extent redefines some goals or means. In both courses, we focus more on competencies and attitudes than on knowledge that would be a prerequisite, for example, for information workers or library students.

Openness is another important concept that we wanted to change during the innovations. The starting point is the social responsibility of the university towards society. There is an aspect of public funding, where we believe it should be logical and correct that products that are used for education are not only for the students of the given field, but can be used for wider development of education. This openness is closely linked to the possibility of impact on the educational activities that courses are pursuing. We were looking for a design that would allow both courses to be offered to the wider public, either for their own study or for the further implementation of individual materials or the whole course in educational practice. Therefore, our ambition is not to preserve study materials for our students only, but to offer the opportunity to educate as wide a range of candidates as possible.

In this area it is possible to mention not only the motivation given by the long-term intention of the university or the simple accent of social responsibility, but also more pragmatic reasons. An open course (Tait 2000, 287-299; Hannafin, Land and Oliver 199, 115-140) may have a greater impact on the

professional community and potential citation or infrastructure involvement in further cooperation. As both courses are designed, they can serve as advertising (in good terms) for those interested in studying.

Another motivation for the changes was gradually becoming less logical and a pure content structure that required more interference than continuous patching or replenishment of news. Also, strategic documents related to information education, which are relevant to KPI11 in particular, have undergone some development over the period and could be used as a basis for innovating courses.

Last but not least, the motivation was to reflect on changes in the technological and design environment of online services and online education. The gradual emergence of MOOC courses (McAuley 2010) or web courses has been a significant competition for classical linear projects, often based on a weekly structure and thematic strength. These courses, which are also often open, represent a certain competition that the university environment must deal with. They can do this either by kutikular closeness or by trying to innovate and adapt to current trends.

Further incentives for innovation were given feedback from students from the subject survey and other research methods. This set of motivations together created the environment of the basic innovation framework in which we tried to transform the two courses.

Innovation of Information Literacy Course

The Paradigm Framework for Innovation Information Literacy Course in the autumn semester of 2016 was the implementation of pragmatic pedagogy by John Dewey. At first glance, this might act as a certain contradiction; to link pragmatic pedagogy and an online course, but we will try to show that it is not.

The first building block of pragmatic pedagogy is the combination of theory and practice. One should learn what he needs for a practical life. Working with information is one of the functional literacy (Elmoborg 2006, 192-199) that is necessary for adaptability in the information society. In this respect, the ability to adequately handle information is something that is needed for life. The entire course is set up so that the student chooses the subject of his / her work, works with resources and databases that are relevant to his / her field and interest. The fact that every student can work on something that is interesting for him / herself, and this throughout the semester, we perceive it as essential, and it is also something the students positively appreciate in the feedback of the course. (Černý, Chytková 2013, 33-39)

The combination of life needs and the course is related to the choice of tasks that do not focus on the practice of any universal skill, but on clearly identified important tasks and competencies that are always associated with the subject. Students should not, ideally, create any role in the drawer, but they should systematically prepare themselves for the creation of their own text, which they will continue to use.

A fundamental change has gone through the whole environment. Instead of IS or Moodle, the entire educational content is transferred to Wordpress (Patel, Rathod, Parikh 2011, 182-187) so that the entire

course acts as a website that focuses on the topic of working with information. Instead of a textbook or a script, both the language and the form were directed to a regular site that students read outside of normal learning. The aim was to create a material that would have an ordinary and natural impression. For these reasons, we tried to avoid all the shapes, such as repeating, learning, the frames etc. that are typical of teaching materials, and we have focused on really using the common language.

Also, individual chapters are always set up so that it may be a separate article that has its own message, content and can be interesting in itself. The text contains links of two kinds, both on external sources, but also on other parts of the course that are thematically related to it. This approach allowed us to design lessons in a less linear way so that they can skip or reverse the course in a way that the student understands what to do even if, for example, he was not attentive enough in some previous lesson. Links to external sources offer both the possibility of better contextualization, but also correspond to the concept of a classic URL site. Such a concept reflects standard information behavior and offers better possibilities to link educational content to the external environment.

Designed and conceptually we tried to reflect trends in web courses. (Gilbert, Moor 1998, 29-35) The combination of pragmatic pedagogy and modern technologies in online education enabled students to offer a higher level of study autonomy, the ability to proceed at their own pace (for example, it was principally possible to complete the course outside the final test in the first week of the semester), selecting own tools, Throughout the course we also sought some curatorial activity, which results, for example, in a classified catalog of tools that appear in the course.

This tutorial model of learning materials and tasks was followed by tutorial care. It was a fully online course where a certain social distance was offset by the rather intense and close relationship of the tutor and the student. According to feedback, it was one of the key moments of the course where the tutor not only repairs tasks but also gives overall feedback and help. This relationship was strengthened by the fact that the tutors chose students for themselves. (Ehlers 2004)

Course Innovation Creative work with information

Another situation in terms of innovation was in the subject of Creative Information Work. From the point of view of the methods used, he went through a more complex cycle of changes, in which the purely online course became a blended learning course and then again only a distance learning form. The key issue in terms of planned changes was how education should be developed in the field of learning creative thinking and working with information, which is undoubtedly one of the most individual activities. Working with unified tasks or a written test represent only a very limited opportunity to work with feedback, and rather they evaluate the knowledge and mechanical skills of the student, not the individual ability to work creatively with information.

As a key, we also evaluated the students to learn not to stay in their thought schemes and to try to reflect and see the work of others. For this reason, we have decided to use the system of mutual evaluation of students amongst themselves, where the continuous tasks students not only create but also give feedback to their co-workers. It is not just a cost saving but a systematic activity that is supposed to encourage divergent thinking and not to conclude into limited thought schemes.

We tried to solve the problem of individualization of education and its real connection with the student's personal and real problems through a creative diary that forms a significant part of the student's assessment of the course. It is a portfolio in which the student can write his own creative practices, test methods, approaches, warm ups. On the one hand, they try out the different methods and procedures, but they can simultaneously apply to their own needs and problems. The second aspect is that students can more systematically use those techniques that fit them in real situations. This becomes the course of something that affects their way of thinking and behavior.

As far as openness is concerned, we have chosen to publish a course on the NOSTIS platform. They can enroll in MU students (if they want credits, they only have to submit the creative diary at the end), as well as the public who can get a common certificate signed by the lecturers. The primary learning tool is videos that have a dialogic character. Each module is accompanied by a text support and a short task, the repair of which is done through peer assessment. (Topping 1998, 249-276) The course is open and free.

Between each lesson, you can freely walk through the course not (unlike KPI11) open at one time but in three stages. Nevertheless, it offers certain nonlinearity similar to KPI, where we try to make students aware of the contexts of individual creative techniques or approaches.

From the point of view of connectivistic elements, other important elements are available outside the openness of the public and peer evaluation. The first is a Facebook group that acts as a source of mutual inspiration, knowledge transfer, or interesting links. In addition, it fulfills the basic organizational role of the course. Another element is Medium, which we use as a basic publishing platform that allows us to get content that is otherwise difficult to get into classical educational structures and forms, such as mind mapping tools, specific partial tutorials, inspiration, etc.

What is missing from these courses in terms of a large part of the current connectivistic courses is the support of Twitter (Downes 2008). We tried to implement it in KPI11 and we were unable to find a suitable communication form and a sufficient number of subscribers. Not even at the level of course participants or the general public.

Sources of possible data for evaluation

There is a relatively large amount of options for evaluating e-learning courses. Previously, for example, the KPI11 course was studied through the focus group, but for organizational and financial reasons we did

not join it this year. On the other hand, abandoning both KPI11 and KPI22 MU Information System has enabled significantly improved measurement and analysis of user behavior through analytical tools.

In the case of KPI11, a pre-test pair and a final test are prepared for the evaluation. They were designed to be mutually compatible so as to enable them to measure the basic quality of the cognitive shift and knowledge course. Unlike common knowledge tests, both were conceived as competencies and were based on the fact that the student had to be able to work with the text. Although this way of working with students allows more focus on competencies than on knowledge, it has been shown that this method of evaluation is not entirely ideal, especially for over-demanding design and complicated construction of questions.

A key source of information is student feedback, which can be obtained through four basic channels. The largest and most important is the subject poll, which is unified and the same for all subjects at the university. It offers insights into basic questions such as the adequacy of the course in complexity, tutoring, or overall satisfaction with the course.

The second source is spontaneous feedback from students sent feedback by e-mail, which is mostly praiseworthy and students will appreciate some aspect of the course directly to the tutor. You can also work with discussions and reactions on Facebook. Last but not least, we did some informal interviews with participants in order to find some more complex information or impression of the course.

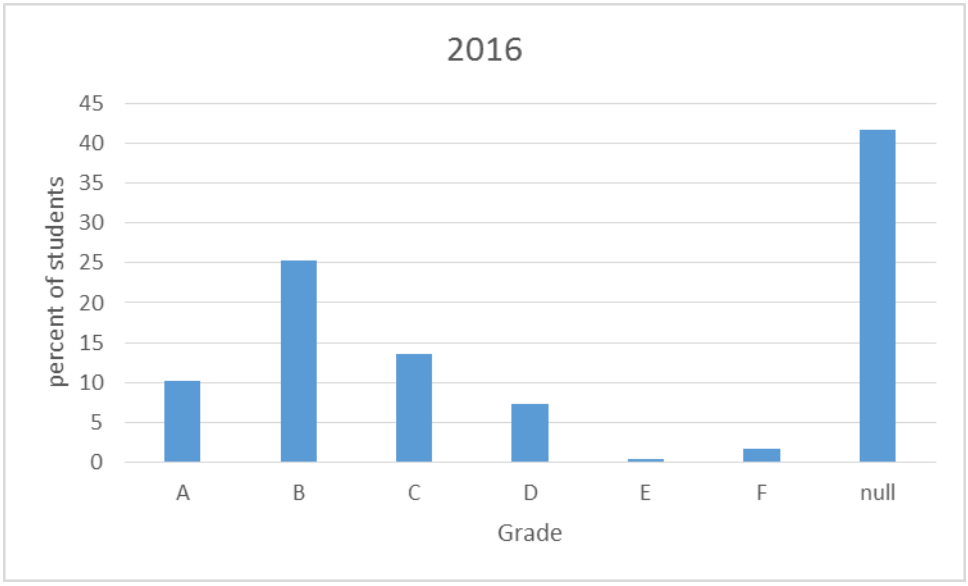
In terms of analytical tools, Google Analytics data is available that is associated with the part of the course running on Wordpress. Therefore, spending time and other metrics are not counted, for example, for submitting tasks or interacting with Facebook. Google Analytics offers both basic features and reports, such as average time spent on a page, traffic sources, where a user connects, etc., but it also allows you to track more complex and demanding metrics such as the flow of users to your site.

For KPI22, the data differs in that Nostis data is available instead of Google Analytics and no ongoing interviews are conducted. There is also no pretest or posttest, as this does not allow the structure or overall focus of the course. In KPI22, therefore, analytical research methods are poorer. In the interest of better data, there would be opportunities for phenomenological in-depth interviews or the use of methods to map metacognitive processes.

Some interesting data from the KPI11 course

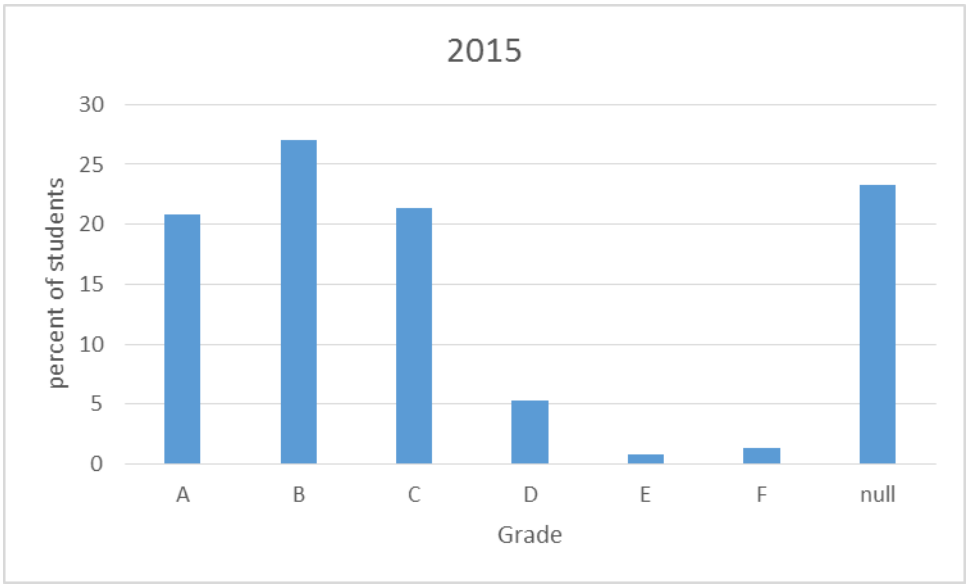
At this point, we'd like to focus on some of the specific data that emerged in the process of evaluating the KPI11 course, which may be interesting for other innovative projects. The first information we can compare is about course marks and learning success.

PICTURE 1 MARKS FOR 2016 - COURSE ON INNOVATION CHANGES.



Source:own

PICTURE 2 MARKS FOR THE YEAR 2015 - A COURSE BEFORE INNOVATIONS.



Source:own

From the graphs above, it can be seen that the innovation change was slightly higher in terms of stamina (from an average of 1.63 to 1.73), but it is particularly problematic that the course has a high degree of inertia, which is related to the fact that The student does not pass all the tasks or do not pass the final test, from 23% to 42%. In this context, it is interesting that there was no information in the feedback about (except for a single contribution) that the course would be light, which was a typical complaint before the changes. On Facebook, this view emerged during the entire semester once before the end of the course. It seems that the changes made rid of the course of the easy subject, but at the same time led to a significant deterioration of the study failure.

The hypothesis that is offered here may be whether a change in the structure of the course rather encourages students who are able to identify with their goals and use it for their own learning needs, but at

the same time does not lead to those who cannot do it They did not study it until they could pass through more formalistically. This may also reflect the answers from the poll:

"I'm glad I attended the course. I have learned a lot of interesting and very useful things that I will surely use when writing my diploma thesis. "

"I liked the concept of the subject. Even though I have already completed a Bachelor Thesis, I have learned a lot of new ones. I found that less sometimes means more :-) "

"It was an on-line course, interesting, but I was terribly lazy, some tasks were a bit difficult some easy overall it was fine"

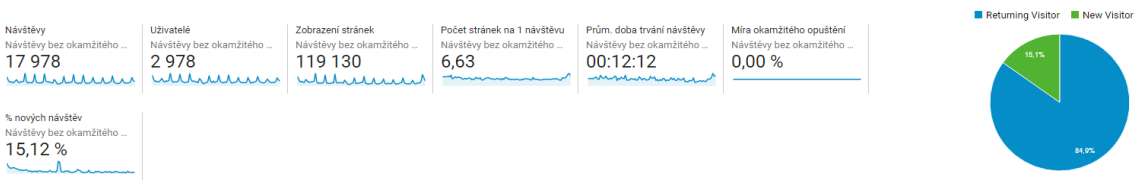
"Overall, I am very glad to have done this subject, although it was, in my opinion, one of the most difficult. I learned not only a lot of useful things to write different seminars or essays but also try to better schedule time, which was given by the obligatory tasks for every week. "

"The materials were interesting and useful for writing academic and professional texts. I learned a lot of information that I will use when writing my diploma thesis. Task and seminar work repairs were always expressly quick. Praise :)"

"Thank you very much for the excellent course, amusing to think about the topic, and the challenges have forced me to try things that I would not find myself. I learned to use new tools. I appreciate very careful feedback, hat down before reading all the seminar work, it must be really challenging. Excellent course! "

Analytical possibilities of the IS in the case of working with several seminar groups are relatively limited in the feedback analysis. It is not so easy to find out how the course leads to the individual statistics being tracked, and more importantly, the above worded commentary is more valuable. From the outburst, the use of multiple learning and information environments (IS, Wordpress, e-mails, ...), the need to register with a variety of online services, and ambiguous or difficult assignments and tests appeared. The feedback also shows that a non-trivial part of the students took the course more time than planned.

PICTURE 3 SUMMARY OF BASIC DATA.



As for the average time of one visit to the site, it takes about 12 minutes if we clean up the immediate departures. This number can be interesting from several views. First of all, the data do not indicate that this time will change significantly over time (that is, for example, remain more motivated and more careful

students), beyond the understandable final fluctuation that can be attributed to the test preparation. Another interesting aspect is the absence of time fluctuations during the week. For example, students who study mostly on Sundays, as shown in the following chart, are not less careful.

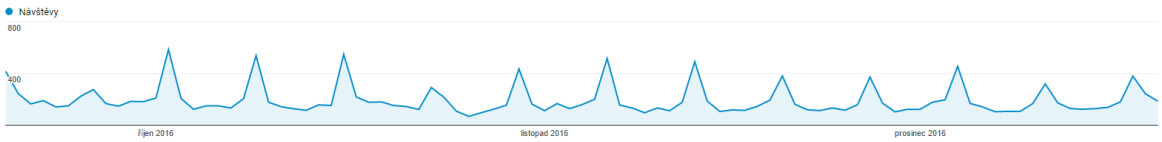
PICTURE 4 AVERAGE TIME OF ONE VISIT TO THE SITE.

Source:own

Absolute data should be taken with a certain margin. It is unclear how many visits per student. Above all, course study takes place largely outside of the teaching materials themselves. However, the data offers at least some correction of the myth that students studying on Sundays (the deadline for submitting a task) are less careful. The other interesting thing is that the attendance almost does not show up with the newsletter that was sent every Monday. There are no significant changes to other days.

The data in Figure 5 then shows how the weekly rhythm was studied. Peaks are connected with Sundays. There are two minor dips - one in October that is linked to a public holiday and a longer block of leave, and the second significantly less pronounced at the beginning of the test week, which are obviously easy to understand and interpretable.

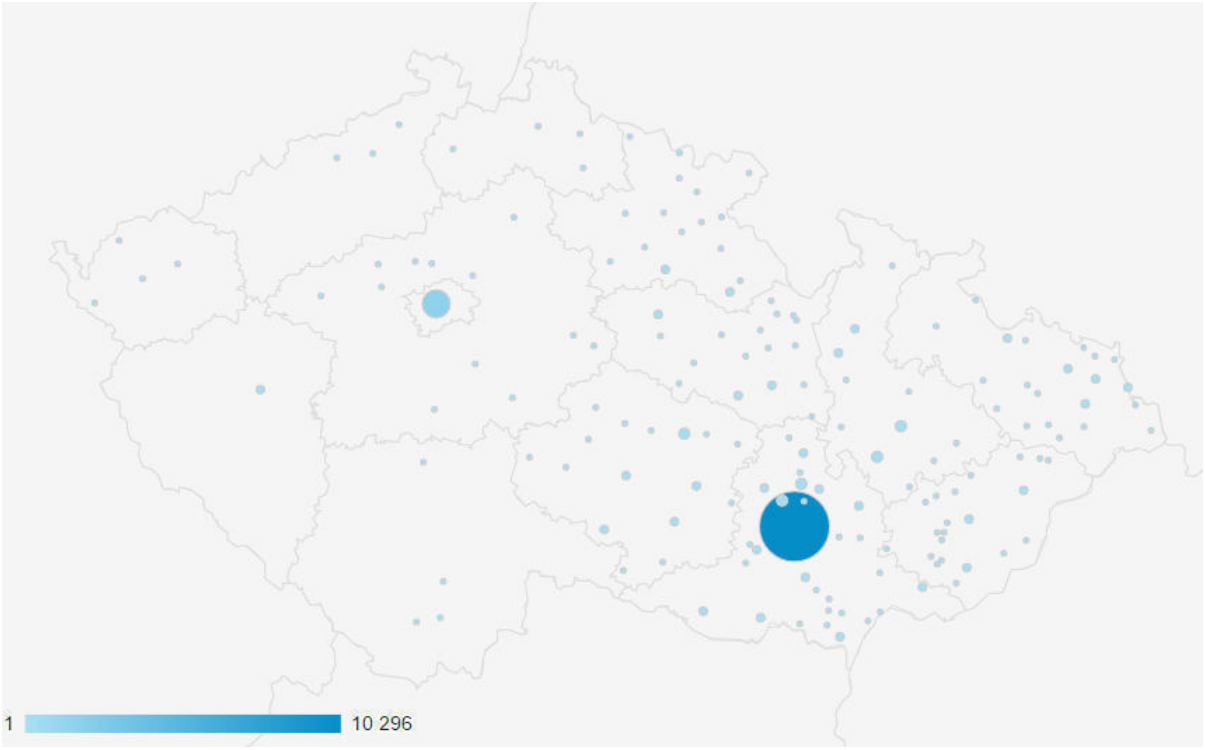
PICTURE 5 WEB SITE TRAFFIC DURING THE SEMESTER.



Source:own

We will also be able to offer geographic data from other interesting data. The course had several participants abroad, where it is to be expected that Erasmus students who enrolled in the course and went abroad. Interestingly, there are generally more pages displayed on the page for a longer period. The map below shows that the course has the most students in Brno, but that it is actually studied in large part of the territory of the Czech Republic. This map can also serve as a basic idea of where the students of Masaryk University come from. According to our court, a great share of Prague may be suprising, of course, the approaches from Moravia are of course dominant.

PICTURE 6 LOCALIZATION OF ACCESS POINTS COME FROM THE CZECH REPUBLIC VISITORS.



Source:own

The theme that we find extremely interesting is the use of a mobile connection. This accounts for less than 10% of the visits, which is well below global data. Explanation can be related to the fact that there is a connection between the task and the study (and here it is more convenient to use a regular computer) or in the fact that the students are not used to studying this, mainly because the IS is not well prepared and usable for mobile phones. However, the data give a fairly clear signal that, for example, the development of a mobile application will not be a crucial and fundamental issue for the majority of students.

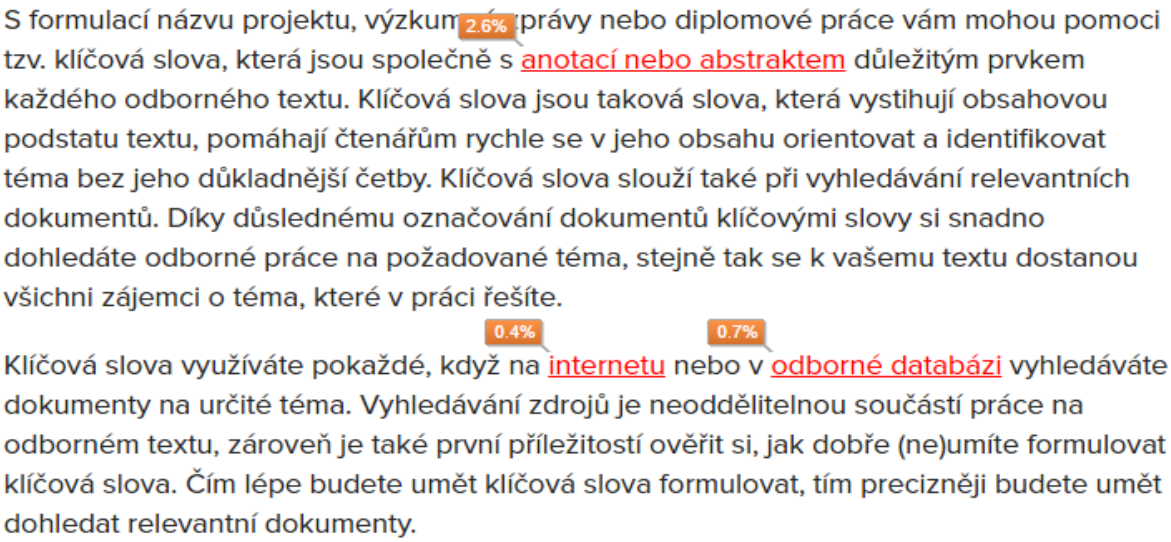
PICTURE 7 MOBILE USERS ACCOUNT FOR LESS THAN 10 % OF VISITS

	Kategorie zařízení	Návštěvy	Návštěvy
	Návštěvy bez okamžitého opuštění	17 978 Podíl z celku v %: 70,87 % (25 366)	17 978 Podíl z celku v %: 70,87 % (25 366)
1.	desktop	16 320	90,78 %
2.	mobile	1 164	6,47 %
3.	tablet	494	2,75 %

Source:own

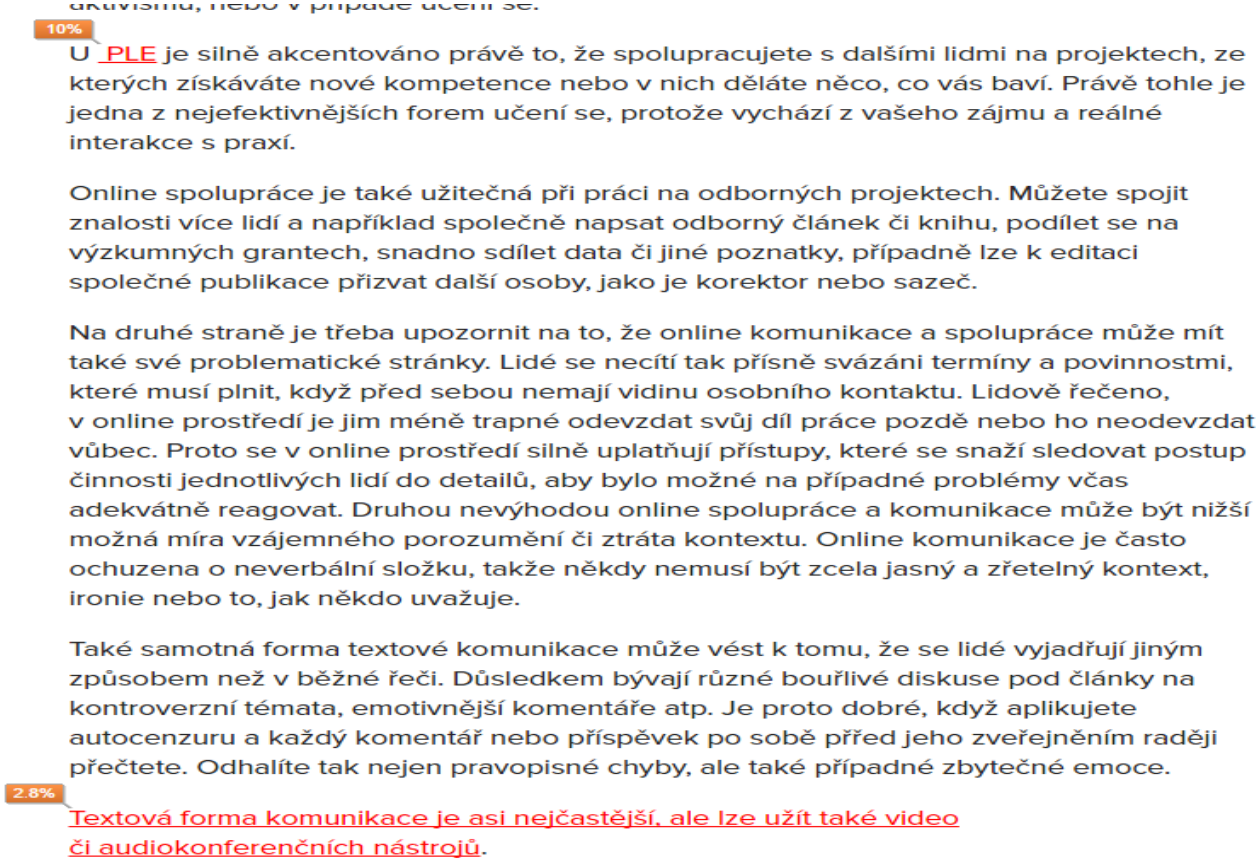
Since the beginning, the course has been conceived as nonlinear, meaning students have the ability to click on the terms that appear in the text, and thanks to them, they can easily browse the content according to their interest, not just according to the didactic intent of the authors of the text. The images below show how data from such click analysis can look like. The average clickthrough rate for links is around 2%, only exceptionally, there are some more. There are more ways to work with these data - links with a very low click (below 0.1-0.2%) are unnecessary or poorly set. In case of very high numbers (over 5%), the question is whether it is an ideally conceived link or a concept that is totally unclear, and a large proportion of students are "discovering" this click.

PICTURE 8 AN EXAMPLE OF A CLICK ANALYSIS ON INTERNAL LINKS.



Source:own

PICTURE 9 AN EXAMPLE OF A CLICK ANALYSIS ON INTERNAL LINKS.



Source:own

Final summary

In the article, we have tried to show some possibilities of innovation of Information Literacy Courses, which have an open character. It should be emphasized that the transition from a common closed course to more open and connectivist solutions is not something that would suit everyone or was associated with less

work. The more active the social networking course and the more open the interaction with external visitors, the more it requires the presence of a professional who will take care of the social network.

Although the research data presented to us was more probatorial or illustrative than the ambition of a complex research project, we hope to show the basic methodological possibilities that can be associated with the evaluation and analysis of such courses and which may help other innovators develop their own projects.

Throughout the text, we have been striving to make it clear how design and innovations can be considered in the online environment. What, if any, can make these changes interesting, good. But also what are the problems or what to watch out for.

References

Černý, M., Chytková, D., 2013. "Přechodový model informační gramotnosti I", ITlib 17 (4), pp. 33-39.

Černý, M., Chytková, D., Mazáčová, P., Šimková, G., 2014, "Přechodový model informační gramotnosti II", ITlib 18 (1), pp. 65-72.

Dewey, J., 1992. "The collected works of John Dewey. " Charlottesville: InteLex.

Dochy, F. J. R. C., Segers, M., Sluijsmans, D., 1999, "The use of self-, peer and co-assessment in higher education: A review." Studies in Higher education 24 (3), pp. 331-350.

Downes, S., 2008. "Places to go: Connectivism & connective knowledge." Innovate: Journal of Online Education 5 (1).

Ehlers, U., 2004. "Quality in e-learning from a learner's perspective." European Journal of Open, Distance and E-learning 7 (1).

Elmborg, J., 2006. "Critical information literacy: Implications for instructional practice." The journal of academic librarianship, 32 (2) , pp.192-199.

Gilbert, L., Moore, D., 1998. "Building interactivity into web courses: Tools for social and instructional interaction." Educational Technology 38 (3) pp. 29-35.

Hannafin, M., Land, S., Oliver, K., 1999. "Open learning environments: Foundations, methods, and models." Instructional-design theories and models: A new paradigm of instructional theory No. 2, pp. 115-140.

Chytková, D., 2011. "Kurz práce s informacemi: Jak to bylo a co bude dál?." ProInflow: Časopis pro informační vědy, Vol 2011, No. 3.

Kadlec, A., 2007. "Dewey's critical pragmatism." Lexington Books.

Kop, R, Hill, A., 2008. "Connectivism: Learning theory of the future or vestige of the past?." The International Review of Research in Open and Distributed Learning 9 (3).

Mazáčová, P., 2013. “Projekt CEINVE – Informační vzdělávání (nejen) pro studenty na Masarykově univerzitě“, ITlib, Vol 17, No. 2.

McAuley, A., et al. 2010. "The MOOC model for digital practice."

Patel, S., Rathod, ,V. R., Parikh, S., 2011. "Joomla, Drupal and WordPress-a statistical comparison of open source CMS." Trends in Information Sciences and Computing (TISC), 3rd International Conference on IEEE.

Siemens, G., 2014. "Connectivism: A learning theory for the digital age."

Šíp, R., 2012. “Dewey a "český Dewey", pedagogika a ideologie“ Pedagogika, 66 (2), pp. 134-153.

Tait, A., 2000. "Planning student support for open and distance learning." Open Learning, 15 (3).

Zadražilová, I., 2012. “Centrum infromačního vzdělávání: rozvoj informační gramotnosti na Masarykově univerzitě“, Sborník z 20. konference, konané ve dnech 11. až 13. září 2012 v areálu Univerzity Pardubice, pp. 34-39.

MEDIA LITERACY EDUCATION TOOL FOR KNOWLEDGE SOCIETY

SEJDI SEJDIU

Faculty of Name
University of Prizren "Ukshin Hoti"
Republic of Kosovo

e-mail of corresponding author: sejdisejdiu@gmail.com

Key words: media, literacy, education, society, programs

Abstract: The availability of various media channels provides the world population with opportunities to identify and gain essential knowledge on different life and professional aspects. The use of media literacy education to create a knowledge society has been an area of debate among researchers and professionals in the industry. Appropriate tools on media literacy and education have led to more information acquisition and knowledge development in societies. According to Hobbs and Moore (2013), the growth of a knowledge society has been supported by governments, nongovernmental organizations and information generation institutions that have collaborated to deliver ideal media content to different population groups.
On the other hand, use of technology, formal education curriculums and social groups have been considered major determinants in developing a knowledge society. The poor association of selected media education programs and the targeted audience is a reason for low penetration levels in regions that are highly populated by young people. Despite such obstacles, proper media literacy programs have supported the growth of knowledge among individuals through appropriate utilization of available channels and sources of information.
The research on this topic will analyze the role of media education literacy in promoting knowledge acquisition and development. Specific media education programs aimed at knowledge development will be reviewed to support the rationale and objectives for this inquiry. First hand data will be collected among the sampled institutions and experts involved in different levels of administering media education programs to the public. The findings and reports from this inquiry will aid governments and other relevant organizations to design appropriate programs will increase knowledge growth and development among different sections of the population.

Introduction

Media literacy is a concept that has long existed in lower educational institutions and institutions of higher learning all over the world. The concept entails the utilization of a wide variety of sources of information in the dissemination of knowledge and information. Skills and abilities central to the actualization of media literacy include the, "ability of an individual to access, analyze, evaluate, and communicate messages in a wide variety of forms" (Hobbs 2011).

A major feature of media literacy is the use of information from the media. Traditional methods of acquiring and disseminating knowledge have relied on formal textual content or copyrighted material usually found in academic institutions. Media literacy deviates from these traditional forms of knowledge acquisition by encouraging individuals to embrace the media as a worthwhile and alternative source of knowledge. The set of tools in media literacy are rich and diverse. However, the print media, radio, film, and video clips have been the most popular for a very long term.

The invention of the computer, the internet, and related technologies has certainly accelerated the progress of media literacy. However, the invention of the Web 2.0 has been a game changer of media literacy through the introduction of social media technology. The use of social media technologies as a tool in media literacy has become an outstanding issue over the last decade. A "tool" in media literacy is a medium or approach used in imparting and transferring knowledge. Social media technologies provide ideal tools for media literacy because of the richness of their content, dynamism of their content, and the rapidity of their information flow.

This research paper narrows down the topic of media education literacy by examining the potential of social media as an emergent tool in media literacy education for a knowledgeable society. The research on this topic will analyze the role of media education literacy in promoting knowledge acquisition and development. Specific and emergent media literacy tools aimed at knowledge development will be reviewed to support the rationale and objectives for this inquiry.

Media literacy and medial literacy tools for knowledgeable society

According to Kellner and Share (2005), literacy is the "ability to gain skills and knowledge to read, interpret, and producecertain types of texts and artifacts and to gain the intellectual tools and capacities to fully participate in one's culture and society." Media literacy is a subset of literacy that prioritizes media content in the impartation of knowledge to students (Kamerer 2013). Although it encourages students to learn from the media, it also trains them on the ways in which they can resist the manipulative ways of the media by using the content from the media in a constructive way (Hobbs 2010; Alper & Herr-Stephenson 2013).

Historically, media literacy has been associated with print media, radio, and television/film sectors. Teachers using tools from these media literacies often felt comfortable in using them because they required thorough and well-planned preparations. Moreover, the teachers had the privilege to filter content that was deemed irrelevant to the learning contexts of students (Petko 2012). In other words, teachers had control over the media literacy tools. However, the rapid advancement in technologies such as Web 2.0 and sophistication of mobile devices has upset the traditional media literacy tools.

The emergence of Social Media platforms such as Facebook, YouTube, Twitter, Snapchat, Instagram, and Tumblr among others have revolutionized and widened the array of tools needed for media literacy. Conservative advocates for traditional media literacy tools have discredited the ability of these social media platforms to act as tools in the educative process. However, the new media literacy tools appear to be the future based on the number of people, both young and old, who have embraced them for their knowledge acquisition and dispersion attributes (Literat 2014). One of the major arguments against the new media literacy tools is the supposed irrelevance of Henry Jenkin's framework of participatory culture in the assessment of their effectiveness as educative tools for knowledgeable society (Literat 2014).

The requisite media literacy skills include play, performance, simulation, appropriation, multitasking, judgment, networking, navigation, visualization, collective intelligence, and distributed cognition. Play is the ability of an individual to solve a problem by experimenting with one's surrounding. Performance entails improvisation and discovery through the adoption of alternative identities. Simulation involves the interpretation and construction of dynamic models of the processes occurring in the real world. Appropriation is the meaningful sampling and remixing of media content (Ahn 2013). In other words, an individual enriches content extracted from the media. Multitasking entails the ability of an individual to

continually scan one's environment for salient details and shift focus accordingly. Judgment skill needs an individual to use different sources of information selectively based on their reliability and credibility. Networking involves one's capability in searching, synthesizing, and disseminating information. Navigation entails the undertaking of a journey across diverse communities whilst discerning and respecting their multiple perspectives. One who successfully completes navigation is in a better position of selecting alternative norms. Visualization refers to one's ability in creating and understanding visual-based information (Ahn, 2013). Collective intelligence involves the incorporation of others in pooling knowledge and comparison of notes in realizing a common result. Distributed cognition is the ability of an individual to utilize purposefully and strategically use tools in expanding mental faculties.

The skills proposed above by Jenkins et al. (as cited in Literat (2014)) regard individuals as active participants in media literacy. This framework has been proven to work in traditional media literacy tools such as print media, radio, and television. However, it is imperative for a research study to use the Henry Jenkins framework in assessing the effectiveness of the new media literacy tools in knowledge development and transference.

Research Hypothesis

This research paper postulates that the new media literacy tools are appropriate in their informal settings in contributing to a knowledgeable society. One of the concerns of the authors in the literature review has been the lack of instruments for assessing the effectiveness of the new media literacy tools. However, the adoption of Henry Jenkins framework for new media literacies enables the research paper to analyse the findings from select papers by experts and researchers who have investigated the applicability of new media literacy tools in knowledge acquisition.

Methodology

A systematic review of articles published by experts on the subject was undertaken. An electronic search of scholarly articles published between 2010 and 2017 was conducted on various such engines and digital libraries such as ProQuest, ebscohost, Scopus, and Thomson Reuters Journal. The key terms of the research search included "media literacy," "education," "digital literacy," "knowledge", "knowledge society," "education tool," "informational literacy," "new media literacy," and "knowledge development." The search criteria yielded 20 articles of which four satisfactorily met the objectives of the paper. The restriction of the search to 2010 and 2017 was due to the cognizance that new media literacies have emerged in the last decade and these new media literacies have had a disruptive effect never seen before. Therefore, restricting this search to this timeline ensures that the research paper reflects the current trends in the society.

Results

A study by Pimmer, Linxen, and Gröhbiel (2012) to investigate the use of Facebook as a media literacy tool discovered it to be the most widely used due to its wide accessibility and easy reach. Most respondents claimed that they preferred Facebook because it could be accessed through the mobile phone. The respondents also claimed that specific Facebook sites and groups provided them with the opportunity to engage in professional-based and educational-based discussions that were the creation of their peers. The authors identified Facebook as a learning tool that provided users with the following advantages.

First, it was a platform for many of them to access explicit educational content and deliberate learning practices. The facilitation of the process mentioned above was mainly through the creation of walls on which the creator or administrator would post a question or open a discussion thread and leave it open for friends and members to answer the question or comment on the post. Second, it facilitated the sociocultural aspects of understanding of learning. Facebook provided members with the opportunity to participate and express their professional identities. A single post that identified the administrator as a member of a certain profession was likely to attract likes and comments from members of the same profession or even students interested in a particular profession. Thereafter, a series of threads and discussions revolving around certain topics and subjects would follow.

June Ahn (2013) also undertook another study to investigate the ways in which Facebook use among users enabled them to acquire the media literacy skills as prescribed by Jenkin's framework of literacy skills. The skills that the researcher focused on included negotiation, networking, judgement play, multitasking, appropriation, and transmedia navigation (Ahn 2013). He undertook a regression analyses in which the seven media literacy skills were dependent variables measured against four independent variables including friending, affiliating, messaging, and information sharing. The control variables in the study were age, gender, literacy, and technology. The findings confirmed the following. Negotiation literacy directly corresponded with an individual's ability to message others on Facebook. However, the negotiation literacy skill was inversely related with friending, affiliating, and information sharing. Networking corresponded highly with messaging, affiliating, and information sharing. It is important to note that those Facebook users with a large pool of friends often shared the most information on the platform. Appropriation also corresponded directly with information sharing. The very act of sharing information is appropriation because the user uses information from one source to spread to others. A high correspondence was also established between information sharing and transmedia navigation. However, the researcher failed to establish any relationship between Facebook usage and the impartation of media literacy skills such as play, judgement, and multitasking. This failure is understandable due to the very nature of Facebook. The failure to establish play was due to the absence of advanced features on Facebook that could allow a user to tinker with objects or artefacts. However, such features are most likely to be

found in emergent social media platforms such as Instagram, Snapchat, and Tumblr. The failure to establish judgement was there because of the very nature of Facebook. Judgement entails the ability to verify the authenticity and reliability of information sources. The act of sharing photos, emoji, and videos to others is a casual affair for most Facebook users. However, the need to verify the authenticity of media content that one intends to share with friends and the public has increasingly become important with the increasing number of lawsuits involving defamation photos and wall posts. The failure to establish multi-tasking as a media literacy skill is attributable to the device that the users were using. Most of the users were on personal computers (PCs) or laptops. Such devices enabled the respondents to multitask without affecting their usage of Facebook. Mobile devices would have presented them with a challenge in multitasking between Facebook and other applications.

McWilliams, Hickey, and Hines (2011) are another group of researchers who investigated the use of Twitter as a media literacy tool. Twitter is exceptional in its usage due to the limitation of a tweet to 140 characters. The media literacy skills as defined by Jenkin's framework that were applicable in this study include play, appropriation, distributed cognition, network, and collective intelligence.

Their utilization of play as a media literacy tool was evident in their ability to tweet their ideas and contributions. Such an exercise requires a student to quickly structure one's complex thoughts and ideas to 140 characters yet convey meaning. The very act of tweeting was appropriation because the students transformed their observations and thoughts into 140 characters that were understandable when tweeted. Distributed cognition was evident in the manner in which the students learnt how to use only their twitter handles to communicate with each other. They were avid fans of Facebook, which gave them much space to post their thoughts, photographs, and videos among others. However, Twitter was conversational and much more formal compared to Facebook. Therefore, they shifted from the use of abundant words to the use of scarce characters. Collective intelligence was evident in the way in which each student strived to construct the best sounding and understandable tweet. An impressive and highly educative tweet from one student about the content on the Fan Fiction would motivate other students to work harder in reviewing the content, the tweet, and then reply by tweeting about the subject.

Bloom and Johnston (2010) are another group of researchers in this review that examined the usefulness of YouTube as a media literacy tool in the educational context. They chose YouTube over other forms of video or film instructional content usually found in schools and institutions of higher learning due to its centrality in the "informational revolution." In other words, YouTube was ideal because its content was not controlled. Therefore, it provides teachers with the opportunity to observe the ways in which their students are able to navigate the new media literacies that are mostly found in informal contexts. The description of the methodology of their YouTube-based study cannot fit this section. However, a summary of their

methodology might help in understanding their findings and significance. The researchers required the students to access YouTube, search for and establish contact with video-pals from far corners of the globe, and make videos about their experiences. These videos were shared with their video-pals who were also sharing theirs with the students participating in the research study. An important element in the study was the insistence on the ability of students to find original content, edit the content to suit their narratives, and share the content with their video-pals through YouTube. Their findings confirm the existence of media literacy skills such as play, performance, appropriation, transmedia navigation, and negotiation.

Conclusion

Facebook, YouTube, Twitter, and WhatsApp are revolutionary media literacy tools because they allow the exchange of factual and academic-based information in informal learning or educational contexts. The studies of Facebook as a literary tool by Pimmer, Linxen, and Gröhbiel (2012) and Ahn (2013) reveal a new reality that is plaguing institutions of higher learning: - The blur of educational boundaries is increasing at an alarming rate. Moreover, institutions of higher learning should recognize that their role as the "gatekeepers" of formal knowledge is slowly being eroded with the rampant sharing of knowledge in the informal platforms such as Facebook.

One major advantage of social media as an educational tool is the pull-strategy it accord users. In this case, learners select when and how they are going to engage in the creation, sharing, and review of educational content or knowledge with their peers. This advantage is particularly useful for the transmission of knowledge to learners or populations found in least developed countries where access to formal knowledge is restricted to the few institutions of higher learning or poorly stocked public libraries. However, the acceptance of social media tools as alternative media literacy educational tools should be cautious.

Social media platforms such as Facebook, Twitter, and YouTube are by their very nature informal. First, they lack the quality control found in institutions of higher learning or long-established platforms of media literacy. Although peers can help in quality control, the veracity and validity of their advices have no protections that are usually found in formal learning platforms. Moreover, most of the users sharing their knowledge and content through these platforms often disregard the strict rules and regulations on copyright violations. Second, the unsystematic presentation of content from peers is unadvisable for an educational environment especially in instances in which the academic literacy levels of members of a group or wall are not definitive. Moreover, the content presented does not conform to any particular educational curriculum. Third, social media platforms were originally meant to foster connectivity and social cohesiveness. Consequently, the information presented on such platforms might be questionable from educational and objective points of view because of the tendency of the people sharing the message to seek "likeability" among peers. Nevertheless, the inevitability of these new media literacy tools in

educational settings is a reality. It is upon institutions of higher learning and government educational regulatory bodies to brainstorm ways in which they can be integrated into the educational sector without compromising the quality and standards of education.

References

Ahn, J. 2013. "What can we learn from Facebook activity? Using social learning analytics to observe new media literacy skills." Proceedings of the Third International Conference on Learning Analytics and Knowledge. Leuven, Belgium: ACM.

Alper, M., & Herr-Stephenson, R. 2013. "Transmedia Play: Literacy Across Media." Journal of Media Literacy Education, 5 (2), pp. 366-369.

Beschorner, B., & Hutchison, A. 2013. "iPads as a Literacy Teaching Tool in Early Childhood." International Journal of Education in Mathematics, Science, and Technology (IJEMST), 1 (1), pp.16-24.

Bloom, K., & Johnston, K. 2010. "Digging into YouTube Videos: Using Media Literacy and Participatory Culture to Promote Cross-Cultural Understanding". Journal of Media Literacy Education, 2 (2), pp.113-123.

Hobbs, R. 2010. "Digital and Media Literacy: A Plan of Action." White Paper. Washington, D.C. : The Aspen Institute.

Hobbs, R. 2011. "The State of Media Literacy: A Response to Potter." Journal of Broadcasting & Electronic Media, 55 (3), pp. 419-430.

Kamerer, D. 2013. Media Literacy. Communication Research Trends, 32 (1), pp.1-26.

Kellner, D., & Share, J. 2005. "Toward Critical Media Literacy: Core concepts, debates, organizations, and policy." Discourse: Studies in the Cultural Politics of Education, 26 (3), pp.269-386.

Literat, I. 2014. "Measuring New Media Literacies: Towards the Development of a Comprehensive Assessment Tool." Journal of Media Literacy Education Volume, 6 (1), pp.15-27.

McWilliams, J., Hickey, D. T., & Hines, M. B. 2011. "Using Collaborative Writing Tools for Literary Analysis: Twitter, Fan Fiction and The Crucible in the Secondary English Classroom." Journal of Media Literacy Education, 2 (3), pp. 238-345.

Petko, D. 2012. "Teachers' pedagogical beliefs and their use of digital media in classrooms: Sharpening the focus of the 'will, skill, tool' model and integrating teachers' constructivist orientations." Computers & Education, 58, pp.1351–1359.

Pimmer, C., Linxen, S., & Gröhbiel, U. 2012. "Facebook as a learning tool? A case study on the appropriation of social network sites from mobile phones in developing countries". British Journal of Educational Technology, 43 (5), pp.726-738.

Tulodziecki, G. 2012. "Approaches to Learning with Media and Media Literacy Education - Trends and Current Situation in Germany". Journal of Media Literacy Education, 4 (1), pp. 44-60.

Pilots‘ traning

RESEARCH AND PROPOSAL OF THE NEW TRAINING METHODOLOGY FOR AIRCRAFT SPECIALISTS

IGOR ČERNÁK
DANIEL POLČIN
RÓBERT JANIGA

Faculty of Education
Catholic University in Ružomberok, Slovak Republic

e-mail of corresponding authors: Igor.Cernak@ku.sk, polcin.daniel@gmail.com, Robert.Janiga@ku.sk

Key words: pilot training, L 410 UVP – E20 pilot training, SWOT analysis, STEP analysis, PDCA cycle.

Abstract: Based on our research and analysis of the possibilities of streamlining and enhancing the effectiveness of the current L410 UVP - E20 training methodology, conducted in the years 2015-2017, we propose methodical procedures, methods and forms in the following structure:

1. Analysis of the current forms and methods of training with the aim to reconsider: ground pilot training, simulator training, pilot training on the aircraft
2. Feedback and verification of fulfillment of qualification requirements.
3. Proposal of the methodology for the preparation and implementation of the training: from the point of view instructors, in terms of meeting objectives and training content: with respect to proven teaching principles, with respect for organization and safety measures during training.

The SWOT (S = Strengths, W = Weaknesses, O = Opportunities, T = Threats) (Blaško 2009) analysis used in the methodology is a strategic planning tool with the aim of achieving the goal. This is an analysis of the internal strengths and weaknesses of the course and training.

Using brainstorming (Rešetová, 2004) provides a creative method of solving problems in general. The method is suitable for the implementation of training objectives based on a group solving of modeled emergency and abnormal procedures in piloting.

The STEP (social, technological, economical, political) analysis gives an insight into the entry requirements for course participants and the factors affecting their path to obtainin the required type rating (Blaško 2010).

The design of the above didactic procedures in L410 UVP – E20 aeronautical training methodology respects a systematic approach, PDCA (plan-do-check-act) cycle (Hrdina 2005). This is a basic and continuous cycle of improvement of the educational process in training.

Based on our findings, we suggest:

- qualitatively refined, with its content and procedures a new training methodology
- pedagogical principles, methods and forms of preparation for its realization
- forms of evaluation of training course outcomes to make more effective training plans.

Introduction

Our research is focused on the analysis of the current training course of L410 UVP – E20 aviation specialists. It took place between 2015-2017. Its aim was to propose methods and forms leading to improvement and effectiveness of the training itself. The reason for the proposed L410 UVP-E20 aircraft training methodology was addressing our Department of Computer Science at the KU Pedagogical Faculty in Ružomberok by representatives of private company LET'S FLY located at the Ostrava-Mošnov International Airport in the Czech Republic.

Since its inception in 1997, the company has been following the tradition of the Czechoslovak Air School and educating the real professionals of the current aviation. Their commitment to quality pilots training is very well founded through cooperation with universities. Research and development of the training methodology of their aviation specialists is part of the program of the Technology Agency of the Czech Republic (TAČR) - "Support of applied research and experimental development " ALFA“.

The cooperator of the "SimSchool" project, which is part of the TAČR program, are the Brno University of Defense and the Catholic University in Ružomberok. Due to the new technology used and the newly used technological element on the L410 UVP-E20 there was a need to adapt the training

to new real requirements. Required are the training of new theoretical and practical knowledge and skills.

PICTURE 1. AIRCRAFT L410 UVP - E20

Source: Own

The project is designed to simultaneously solve the simulator system and the training methodology. The development of the methodology is more demanding in terms of determining and meeting the required criteria that are imposed by various global civil aviation organizations.

The aim of the project is to develop a new training methodology to ensure the effectiveness and success of the training of pilots of the aircraft, in addition to re-designing the current L410 training simulation system for airline specialists.

For this reason, our analysis and comparison of a number of previous methodologies from the aeronautical training environment has become our starting point, where the training methodology is relatively well-engineered and supplemented by rich practical experience. The individual methodologies were analyzed and compared in terms of didactic procedures used. We compared some methodologies (AK-MOT 2004; ATTO-PPL 2014; Baliak, Kopčík, Petříček 2011; Prošek 2010; Kdér 1978).

Goals of training

We focused on the comparison and the presence of the following parameters in the methodologies:

practical preparation of students

time limitations of training

training cycle

organization of training

creating training records

rating

conditions for successful completion of training

conditions for repeating training

tests and tests

- instructor training

instructor's duties

obligations of students

precautions

solving extraordinary situations

didactic principles: consciousness, systematics, clarity, proportionality, durability

We have reassessed the previous methodology of pilots training on the L410 in terms of the above mentioned methodologies, their strengths and negatives. We have designed procedures and methods to improve the current training in:

Instructor training for teaching units

Perform feedback on progress tests

Observe safety precautions during training

Solving potential emergencies

We focused our evaluation considerably on the system of planning and controlling educational activities, which we consider to be a necessary condition for achieving adequate training objectives for the course program.

Through educational concepts, we have formulated educational goals, looking for their current deviations from reality and proposed measures to eliminate them. This process should lead to meet the specific objectives of modernizing training, managing effective pedagogical planning and quality processing of training documentation. It also enhances the mutual communication of educators in conducting training and fulfilling training goals (Petlák, Komora 2003).

The content of education and the necessary performance of the student during the trainingare formulated in the educational standard. This expresses requirements for the outcome of the course with regard to the necessary key competences.

The SWOT analysis is a strategic planning tool with the aim of achieving the stated goal is to analyze the internal strengths and weaknesses of the course and the training.

The use of the brainstormingas an important creative problem solving method is designed to deliver training objectives based on group approach to modeled emergency and abnormal piloting procedures.

TABLE 1. SWOT ANALYSIS			
		opportunities	threats
		-flight simulator (an older model) -modernizing the simulator -the ability to train pilots on a simulator and at a time outside the lesson	The pilot can not use all the simulator options for his training
Strengths	• Instructor qualifications, their 25-hour pedagogical readiness • Instructor ICT skills - pre-training • min. 18-year practice of instructors • training - pilot training with flight experience from other aircraft		
weaknesses	• the need for methodical trainers' work in preparation • higher instructor age • their routine procedures need to be modified		

The STEP analysis gives an insight into the entry requirements for course participants and the factors affecting their path to obtain the required type rating.

TABLE 2. STEP ANALYSIS		
	positive	negative
Social factors	• entry requirements for course attendants are mandatory • the trainee must have a general theoretical qualification of the pilot • pilots come to acquire a new type rating already with 200 hours of flying, complete beginners are not allowed	Pilots sometimes have links to other types of aircraft
Technical factors	• standard procedures are implemented to the training • the training content must fullfil the flight manual supplied by manufacturer Pilot type training is manageable for about 3.5 weeks	
Economical factors	Pilot according to his financial possibilities can make different qualification courses	The relatively large financial costs of re-training for another type of aircraft (70% of the pilots reimburse them from their own resources)
Political factors	Type ratings for both single and multi-pilot aircraft are only valid for 12 months, after which a 4-hour pilot test on the simulator	L410 as a two engine aircraft increases the difficulty of training with the necessary co-operation of two pilots

The design of didactic procedures in L410 UVP – E20 aeronautical training methodology respects a systematic approach, PDCA cycle as a basic and continuous cycle of improvement of the educational process in training.

The recommended concept represents a system modification of the form of the previous training methodology for pilots according to the above procedures and principles, develops the general and specific components of the graduate training profile. Our study formulates the vision of training, its strategies and strategic goals, proposes quality indicators and implementation of the PDCA cycle, and outlines the framework structure of the training plans.

Pilot training of aircraft of any type represents from the didactic point of view a very demanding and responsible content and methodical preparation of aviation instructors who have a highly qualified training in complying with standard aeronautical regulations.

At the beginning of the L410 UVP – E20 aircraft training methodology, we reviewed the form of ground pilot training, simulator training and pilot training on the aircraft. On this basis we set our goals to propose pedagogical principles, methods and forms of preparation, implementation and evaluation of training course outcomes to streamline the preparation of training plans in general for any type of aircraft.

The elaboration of the proposed full pilot training study is based on the template below, which develops both the general and the specific component of the course profile. The study structure:

SWOT analysis and STEP analysis (environmental impact analysis),

vision of training,

strategies and strategic goals of training,

design of quality indicators and implementation of the PDCA cycle,

design improvement of training plans.

Training mission / vision:

In the case of single-pilot aircraft, the training is primarily intended for flying enthusiasts. Two pilots, such as the L410, are preparing pilots specializing in professional activity working with this type of aircraft at their parent company at home or abroad (90-95% of the trainees). Obtaining a type qualification in this case is associated with a strong economic motivation for pilots.

At a specific level – by developing a specific component of the pilot profile, the subject of the eductant is active:

get rid of their useless habits for a given type training from other types of aircraft,

submit and explain in detail what flying on L410 requires,

to learn how to handle normal, emergency and abnormal, critical flight procedures,

helping them to obtain a pilot-specialist certificate on the L410.

Strategies and strategic goals of training

1 Strategy of visualization:

Pilot training is mainly done on a flight simulator .

In the case of multi-pilot airplanes, it is necessary to handle "by IFR" flying.

2 Strategy of searching solutions (Heuristics)

Solving abnormal and emergency procedures in ground-based training employs a brainstorming method based on a group solution that facilitates the creation of creative strategies. The options for dealing with atypical situations are analyzed by the group based on the personal experience of individual pilots. If necessary, look for solutions in the electronic flight manual.

3 The strategy of dissatisfaction with misunderstanding

Pilots learn to analyze and successfully solve the problem as pairs in a multi-pilot aircraft.

Quality indicators and PDCA cycle

1. Ground preparation - final test, it can be repeated 4 times.

2. Simulator training is evaluated every 4-hour block, "fulfilled / failed", which the trainee must master to continue with the next block. At the end of the simulator training, it is necessary to master the progress test.

3. Airplane training:

• landing (need to handle at least 6 landings);

• approaching,

• approach with idling engine (simulated engine disconnection).

Final examination of the pilots at the L410 flight examiner.

Goals of the training:

Obtaining an aircraft type qualification for the L410 UVP - E20.

Methods and forms of training:

1. Ground preparation: completed by a progress test.

2. Simulator training: divided in total to 6 - 7 lessons after approx. 4 h, finishing with progress test.

3. Airplane training: Pilotage training and handling of at least 6 landings.

The whole training is sometimes performed by one instructor, most often two instructors. In each lesson, the instructor can modify the order of tasks that need to be done, not their content. It always goes from simpler to more complex.

Key Competencies (to be gained during the training):

Type qualification for L410 as second pilot or captain (the captain's qualification recognizes own company / company after the second pilot training).

TABLE 3. NIEMIERKO´S TAXONOMY OF GOALS					
Operational side	→	Content side			
Categories:	Facts	Concepts	Senzsorymotor skills	Cognitivemotor skills	Relationships
1. Remembering	describe repeat name	define explain	assign sort choose		
2. Understanding	illustrate	clarify explanin in other words	estimate make	calculate check change	compare
3. Specific transfer		apply	outline use register try	plan demonstrate solve quantify	mention a relationship between
4. Non-specific transfer		analyze classify create	propose	split create	differentiate
5. Evaluation		prove	make an analysis summarize		review

Source (Niemierko 2009).

Content training standard: according to qualification requirements

1. Ground training: 30 hours (number of hours is not strictly specified)

acquaintance with the technical parameters of the aircraft,

acquaintance with the flight parameters of the aircraft,

acquaintance with the limitations and technical limitations of the aircraft,

2. Simulator training: 30 hours (number of hours strictly given together with aircraft training 2h - a minimum of 32 hours)

making normal flights unrestricted,

demonstration of technical limitations - limit airplane flight limit values,

3. Airplane training: 2 hours

- learn how to handle the piloting of the L410,

- learn how to handle emergency and abnormal procedures.

TABLE 4. DESIGNING A TRAINING STRUCTURE FOR TRAINING INSTRUCTORS	
Name:	
Employment topic	
Study objectives	General: Specific goals (skills):
Daily schedule	
Education method	Practical training, description, demonstration, interpretation
Time and place of employment (weekly cycle, number of iterations as needed by operators)	Time: 25.01.2016: 09:00 - 11:30 (with supervisor) 13:00 - 14:30 (individually) 26.01.2016: 08:30 - 11:30 (with supervisor) 13:00 - 14:30 (individually) 27.01.2016: 08:30 - 11:30 (with supervisor) 13:00 - 14:30 (individually) 28.01.2016: 08:30 - 11:30 , 13:00 - 14:30 (individually) Breaks: 10:00 - 10:20, 11:30 - 13:00 Room:
Teaching aids Materials	Written preparation, tutorials and presentations to individual modules, notebook, worksheets for individual task training, PC, 2 x dataprojector, required number of workstations.
Supervisor	
Trainers	
Made by	

Performance training standard: Graduate performance requirements

Ground training:

handling the contents of the L410 flight manual supplied by its manufacturer,

knowledge of the technical and flight parameters of the aircraft at the standard level required in the final test,

understanding aircraft limits and technical constraints, awareness of the necessary need for their piloting respect,

Simulator training:

know how to properly analyze and evaluate individual parts of the training,

successfully master the lessons provided by the instructor,

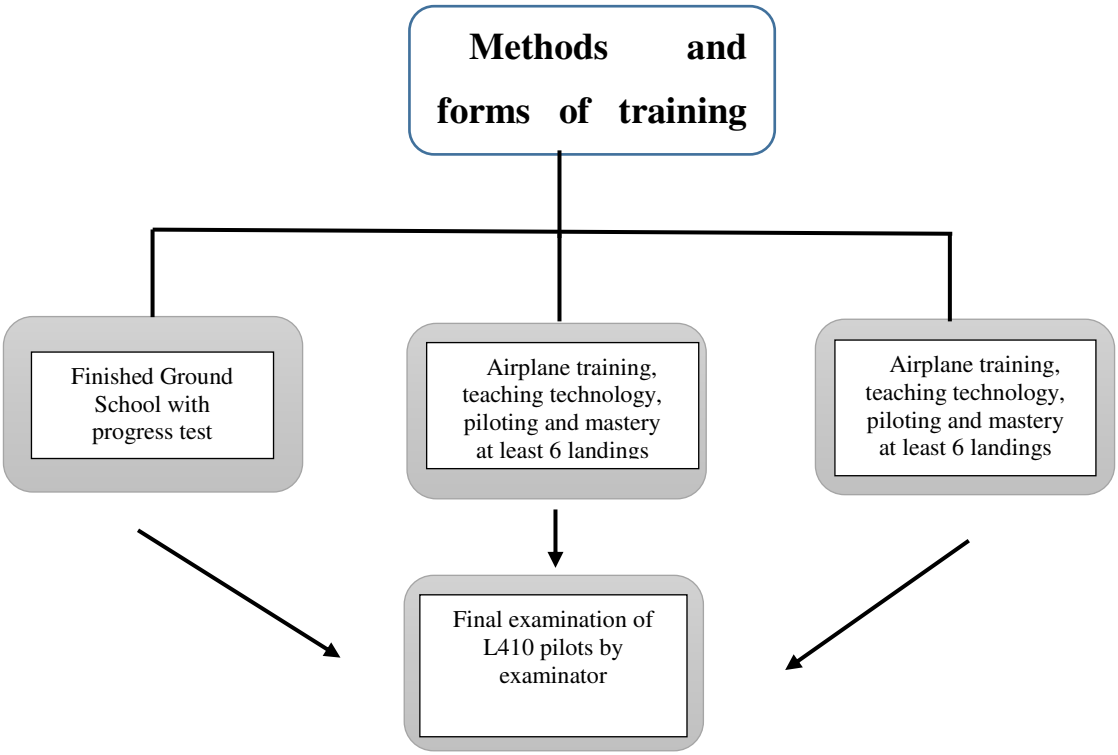
practice a reliable landing,

managing the requirements of the final test procedure,

Aircraft training:

to successfully master the piloting technique on the aircraft

PICTURE 2 ORGANIZATIONAL SCHEME OF METHODS AND FORMS OF TRAINING



Source: Own

Feedback and verification of qualification requirements through progress tests

In fulfilling the content and performance standard of training in its individual phases - ground preparation, simulator training and pilot training, the pilots pass the final and final test. Qualitative and qualified test preparation as a didactic feedback tool for teaching and training also provides the quality of training course participants - L410 UVP - E20 pilots (Rosa 2007).

Training and feedback (Lavický 2014)

In some simplifications, the training course can be understood as a controlled process that has two functions:

a) the transfer of new knowledge content

b) control of the quantity and quality of acquired knowledge and skills

Only the training process can work optimally, in which both functions complement and overlap.

The most attention is currently devoted to the information channel (mostly due to time reasons). Feedback is important not only for effective management of training, it is also a motivating tool for educating of studnents.

The role of educators - training instructors is to bring eductants - course participants to the desired results effectively, on a professional level, in the shortest possible time. This goal in pedagogy serves the so-called PDCA cycle (Walter Shewhart, Edwards Deming – 1930s see Aguayo 1990)

The PDCA cycle is a basic cycle of improvement. It is a continuous improvement of the educational process, it requires educators to constantly think, analyze and evaluate their own work.

PICTURE 3 FLIGHT SIMULATOR OF AIRCRAFT L410 IN MOŠNOV AND PROJECT PARTNERS

Source: Own

PDCA cycle consists of 4 parts:

P- Planning: planning of a course of action to improve the quality of teaching (planning of the verification process and introduction of some innovations, although small, eg innovations in the way of motivation of educators or testing of eductants, realization of feedback, learning, enhancing it, etc.)

D- Doing: Implementation of the education plan

C- Checking: Assessment of activity through appropriate methods and techniques

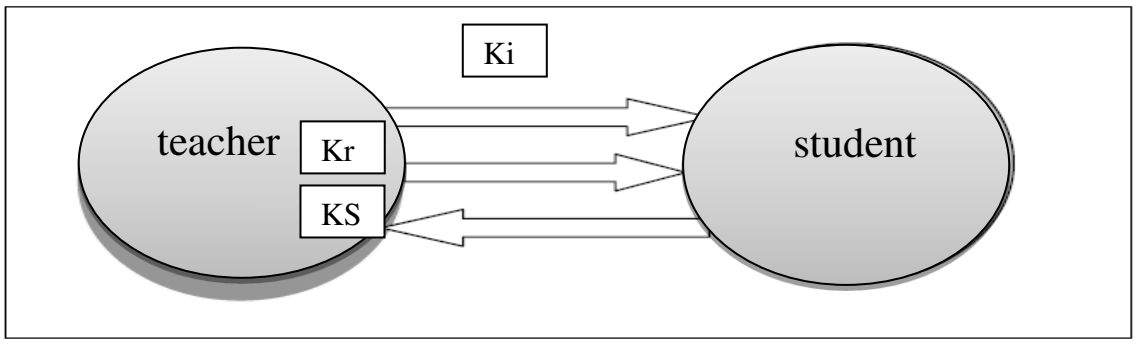
A- Acting: Analysis, reflection, performance evaluation, resulting in a new action plan and a new PDCA cycle.

Objective and professional appreciation of the acquired competencies, theoretical knowledge, habits and skills of pilots by training instructors ensures the quality of the trained pilots and the safety of air traffic on the L410.

We have analyzed in detail the appropriate test programs used in the feedback process in the educational process. From comparison and our own personal pedagogical experience, the LMS Moodle system appears to be the most appropriate for pilots training, which we recommend to include in the training process.

Design of training methodology with respect to didactic practice principles, organization and safety measures during training

PICTURE 4 THE NATURE OF THE FEEDBACK



Source: Feedback (Chráska 1999):

LEGEND:

Ki - information channel transmits information from instructor to eductant and manage its activity

KS - the feedback channel, the instructor learns how the educator has mastered the training curriculum

Kr - correction cahnnel, instructor adjust the training process

In practice, we can meet a variety of different methodologies for special types of practical training. Their common feature is to provide the best and most comprehensive guide to achieve the effectiveness of specific training. However, the different methodologies differ from each other in focusing on the different types of training and the resulting specification of the training tasks. The methodologies give us a different view of the training, they differ from the content page, the construction of individual parts. The aim of our research was to analyze the expert methodologies and then to design our own training methodology that provides a more comprehensive view of training, a sort of guiding template that can be applied to the common parts of the training methodologies. For this analysis, we have chosen a pedagogical point of view on methodologies, we have studied setting goals and defining specific training tasks, training methods, organization, training of educators and eductants for training, observance of safety principles in the practical part of the training.

The purpose of the proposed methodology is to create for the instructors a comprehensive and uniform methodical material for the training of students eductants. The main objective of the

methodology is to provide professional development of skills and knowledge and to provide methods and tools for the implementation of training.

Requirements and training objectives

The aim of the training is to obtain, maintain and improve the habits needed to perform the function, to maintain the necessary knowledge and skills with a focus on safety.

The aim of individual education and training is to increase the professional, physical and psychological readiness of an individual to perform tasks.

The aim of the group's education and training is to achieve a concerted action in performing common tasks.

The objectives of education and training are achieved (Mateides, Strašík 2004):

thorough, continuous and intensive training,

permanent deepening and consolidation of habits during training,

carefull control of the performance of the training tasks.

Practical training and theoretical examination of educators, analysis and generalization of training is an integral part of the improvement of professional growth and are among the basic duties of instructors. During the training, students' level of knowledge and skills must be demonstrated.

Systematic approach to training

The criterion of training is to move from simpler to more complex, always to be as complex as possible and to take place in an environment that is as close as possible to reality.

What the student needs to learn - The basic goal of training must be clearly defined, concrete, feasible, verifiable, and in line with the curriculum or training plan. From it, the objectives are partial, specific (goals in individual phases and types of training). We set goals from simple goals to more complex, from general to specific. In order to achieve the objectives to achieve specific knowledge and skills, it is possible to use Niemer's table as a tool where these activities are characteristic of a specific area of education.

What is the level of skill to achieve - what in the specific training phase the learner controls (exact assignment of tasks and objectives that can be achieved after the task is done), what documents are needed to achieve this (regulations, guidelines) and what certification is obtained at a particular stage of training.?

Training cycle, exercise density, minimum amount of exercises - expresses the ability to handle set goals by the end of exercises, also includes evaluation and feedback of the entire training process (Turek, Albert 2005). You can go to another exercise after successfully completing the previous one. The instructor is responsible for following this rule. If necessary, it is possible to repeat the exercises

already performed. In this case, if exercises are performed beyond the specified minimum exercises, these must be substantiated, documented.

Improvement training is preceded by the basic training that the educators undergo on the theoretical and practical side. Improving training is practiced only by practical exercises with additional explanation of parts that are problematic.

Training records

All records of theoretical and practical training and the level of knowledge acquired by the students must be kept in the management training or, where appropriate, the person authorized to do so. Records can be written and electronic. All student records (personal, attendance, passing examinations, practical training) must be archived for a specified period of time (5-10 years, depending on the requirements of the control bodies) in order to obtain information about the studentr if necessary.

Organization of training

The management, director, main training instructor (hereinafter referred to as training manager) is responsible for managing the process of improving the knowledge and practical habits of students, taking care of the correct training methodology, ensuring that the training is professionally, safely and efficiently managed; organize and ensure a thorough check of trainers' readiness, check the correctness of the use of the training equipment, review it, keep an overview of the training, appropriate measures to prevent extraordinary events during training (Linczényi, Nováková 2001).

Training on individual sites is managed by trained instructors with a valid certificate (specific type of authorization) in accordance with the required regulations, methodology and curriculum.

All training materials, curricula and training plans are based on valid regulations for the type of training (specific regulations).

Professional training is performed by individuals, students or entire groups, depending on the type of training.

Admission requirements for eductants performing vocational training - specify minimum education, age, physical fitness, health requirements (certification), psychological readiness, linguistic knowledge, training requirements for valid training (certificate, card, etc.) , or to count the training-related practice.

For specific types of training, determine the maximum number of students per instructor.

Types of training

Each type of training has its own specifics. According to them, it is necessary to adapt the objectives of the given training, to determine the theoretical knowledge and the procedures for its implementation, the partial and final evaluation and the expected outputs. Depending on the criterion in which

knowledge and skills the eductant is located, we could divide the different types of training on (Mateides, Strašík 2004):

Basic training – student is a complete beginner. During training, he / she obtains general theoretical knowledge of the problem, information about technical equipment used for training, or if he / she successfully completes training on the simulator. As a rule, it should be completed by a final test, exam or qualified simulation exercise. The result is a certificate of successful completion of training, the acquisition of which is a condition of participation in other higher types of training.

Requalification training – it is a type of training where a learner trained to control a certain type of apparatus, the device must, for objective reasons, be trained on a different, similar type of device. Completion of training is subject to the same rules as basic training. However, it has a shorter duration (the learner has acquired some knowledge and skills in the previous training after the theoretical and practical aspects).

Advanced training – a higher type of training for students who have completed basic or requalification training. Here, the student improves in depth in this subject, acquires specific knowledge and skills, practically can manage without any difficulty the actual instruments and devices. It can also share part of simulation training and real-time training. This is a condition for real-world training and a successful simulation training. The output is usually the privilege or license needed to control this device.

Maintenace training – is designed to keep the habits gained in previous training necessary to implement new technologies or procedures. It is performed periodically or according to the knowledge and skills of the eductant.

Preparation and duties of instructor (Blaško 2009)

Theoretical training includes complete theoretical knowledge of the subject to be practiced, individual working procedures and activities for controlling apparatus, software used in computers.

The principle of theoretical preparation lies in its systematicness, the instructor prepares the individual documents for the training so that gradually goes from the simpler knowledge to the more complex, so that after completing one theoretical circuit the student's level of knowledge is sufficient to advance to the higher part of the training.

Appropriate methods of theoretical preparation of eductants are verbal and illustrative methods.

The instructor has all the necessary rules, guides, methodologies, guidelines, laws. The instructor prepares himself / herself or the students with written or electronic study materials. Eductants must have access to these materials

Instructor's duties during training

Exactly describe and demonstrate the way in which individual tasks are performed. Issue instructions and orders for practical tasks. Keep track of the progress of the practitioner's work and keep track of the observations and assessments. Keep an overview of eductors who have experienced gross errors during training. Maintain continuous communication with training and technical support via radio link or visual signals. Monitor the weather situation (training in the exteriors) and stop the activity if the safety of exercising due to weather changes or technical reasons is jeopardized, in case of loss of connection. Provide first aid in the case of injuries and injuries until the arrival of professional medical assistance.

Instructor's duties after training

Provide information on the completion of the individual parts of the training course. Ensure that all machines, devices and are off. If the material is used for training purposes, check its condition, in the event of damage report the fact to the person responsible for the purpose of its decommissioning. Evaluate training for individual pupils, learn about their outcome, discuss with educators about the knowledge and skills they have achieved. Provide the necessary documentation on the course of the training.

Eductant duties

Keep strictly discipline, do not interfere with the training process. Observe safety precautions during training. Perform only activities as instructed by the instructor. Track, repeat and issue signals and follow them. If necessary during training, use protective equipment. Use the training material in the prescribed manner. Any injuries or damage to the equipment or material should be immediately reported to the instructor. During training do not use mobile phones, communication is allowed only by prescribed means of communication between the exercising. Each trainer has the right to terminate the training for personal reasons at any time, and he is obliged to immediately inform the instructor of this fact and cause of termination

Records of the training process

All records of theoretical and practical training and the level of achievement of the pupils' knowledge are kept in the management training or, where appropriate, the person in charge. Records can be in written and electronic form. All student records (personal, attendance, passed exams, practical training) must be archived for a period of time (5-10 years, depending on the requirements of the control bodies) in order to obtain information about the eductor if necessary.

Safety training

Safety precautions for training

In order for training to be effective and especially safe, it is the responsibility of each participant in the practical training to know his / her own duties and comply with the prescribed rules and, in the

event of ambiguity, ask the instructor to specify the activity. Failure to observe procedures, arbitrary interference or modification of equipment under electric current, management of training by an unqualified person may result in injury or extraordinary events.

Basic safety precautions of all participants before starting practical training:

Be familiar with the individual tasks of the training.

Know management training officers, their main tasks, basic competencies, deployment.

Know your responsibilities.

Know safety principles during training.

Know the manipulation of material used for training.

Ensuring appropriate microclimate conditions at the workplace

Ensure room ventilation. It is advisable to use air conditioning – the difference between outdoor and indoor temperature should not be more than 5-7 ° C, correct ventilation, combination with rotary fan. The optimal temperature range at the workplace is 22-25.5 ° C, humidity 45-75%, fresh air supply per person at least 30 m3, noise level up to 65 dB. During the winter period, do not overheat the rooms. Do not place combustible materials near the heaters. Do not turn the heaters to full power when they are near tables.

Method of work aimed at eliminate the visual load and load of the supportive-movement system during training on the display unit (e.g. computer).

The training manager is obliged to ensure regular interruption of work with the display unit no later than four hours of continuous work. The total working time on computer screen should be a maximum of 6 hours.

Breaks should be at least 5 minutes after the first hour, the second 10 minutes, and after 3 hours 15 minutes. During a break, students has to perform another activity away of the screen, ideally in a different working position than sitting.

There is no need to introduce a special work and rest regime when working with computers when this work is alternated with other activities that do not burden the organism in a way similar to working with a computer, and work on a computer does not exceed a total of 4 hours.

Recommendations of the National Labor Inspectorate (Národný inšpektorát práce 2005)

Interruption of work with the screen no later than four hours of continuous work.

Observe a 15-minute break after every 2 hours of continuous work with average visual claims and average workload.

Observe a 15-minute break after each hour of continuous work with high visual demands and high workload, as well as those work that are associated with a high degree of work monotony.

Choose a suitable work and rest regime, rationally organize your work.

Active use of breaks (relaxation exercises, visual exercises).

Emergency *situations* solving

During the training period, a variety of emergency situations may arise due to a technical error in the equipment, malfunction or sudden deterioration of the weather. These are serious, unexpected and often dangerous situations requiring an immediate response. These situations are preceded by a regular check of the technical condition of the equipment, proper training of standard and special situations, compliance with standards and awareness of the development of weather during the training period.

The instructor and educators must be thoroughly familiar with the manual for handling emergency situations. In the event of an electrical shock, need to know how to disconnect. Know the location and use of fire extinguishers, hydrants, emergency exits. Equally important is to focus on interacting with other components involved in the security system.

Practice of emergency situations through simulation or simulators is the most effective method of their safe handling. Using the simulator to simulate a particular threat, it has the character of a real event, it is very close to reality. In this way, the educator learns about the course of the event, trains the individual actions leading to health, life or property, and is prepared psychologically for unexpected stress and without serious consequences in the failure to manage the situation. These emergency response actions can be repeated by the eductor on the simulator until they are automatized, and they are thoroughly prepared for their safe handling.

Conclusion

Based on our research, we designed for the L410 UVP - E20 instructors and their students a new, systematic training methodology has been developed, with its content and procedures. Pedagogical principles, methods and forms of preparation for the implementation of training. Forms of evaluation of training course outcomes to make training plans more effective. Safety precautions for the training necessary for its implementation.

Achieved goals in proposed methodology for L410 aircraft:

TABLE 5: ACHIEVED GOALS

SWOT analysis	Formulation of strengths and weaknesses of training.
STEP analysis	Modifying training conditions to achieve adequate results.
PDCA cycle	Knowing the external factors affecting the training and the corresponding modification of its content.
Key competences	Designing a method of continually improving the learning process within the training.
Instructor training preparation	Redacting and systematically formulating content and performance training standards.
Feedback and verification of compliance with qualification requirements	Designing a template and structure for the training of training instructors.
Precautions	Formulation of types of training and their characteristic features.
Emergency situations	Instructor duties and control of their performance.

In the training cycles of the following years, we will monitor the success of this methodology and its contribution to the quality of L410 UVP - E20 pilot training.

Acknowledgment

This article was developed as part of the project TA04031376 "Research / development of training methodology of aviation specialists L410UVP-E20". Project TA 04031376 is solved with financial support of TA ČR.

References

Aguayo, Rafael 1990. Dr. Deming: the American who taught the Japanese about quality. A Lyle Stuart book. Secaucus, NJ: Carol Pub. Group.

AK-MOT: Aeroclub of Czech Republic. 2004. Curriculum of Training on AK-MOT airplanes.

ATTO-PPL: Approved training organization. 2014. Training manual - PP1 (A) MODULAR. Training manual - PPL (a) license for single-pilot single-engine landplanes.

Baliak, P., Kopčík, J., Petříček, P. 2011. Mi-17 simulator: Flight training programs on flight simulator mi-17 moder. Service tool. Record label SPA-3-10-1 / Flight.

Blaško, M., 2009. „Riadenie kvality výučby z hľadiska rozvíjania kľúčových kompetencií na riešenie problémov (1)“. Manažment školy v praxi 2009, 2 (2), pp. „2-5.

Blaško, M., 2010. „Príprava učiteľov odborných predmetov pre systém riadenia kvality Výučby“, in: Modernizace kvality vysokoškolské výuky technických předmětu. Sborník príspěvku a anotací medzinárodní vedecke konference, Hradec Králove: Gaudeamus UHK, 2010, pp. 31 – 34.

Hrdina, Ľ., 2005. „Cesty ku skvalitňovaniu školského systému“, Technológia vzdelávania, roč. XIII., č. 9, pp. 3 – 9.

Chráska, M. 1999. Didaktické testy. Paido. edice pedagogické literatury, Brno.

Kdér, F. 1978. VPL4: Methodology of training on gliders. Basic training - gliding. Prague: Central Committee of the Union for Cooperation with the Army.

Lavický, T., 2010. Tvorba a využívanie školských testov. Prešov: Metodicko – pedagogické centrum v Prešove. http://www.mcpo.sk/downloads/Publikacie/Ostatne/OSRIA200901.pdf, accessed on 17th May 2017.

Linczényi A., Nováková, R., 2001. Manažérstvo kvality. Bratislava: STU.

Mateides, A., Strašík, A., 2004. Manažérstvo kvality. Banská Bystrica.: EF UMB.

Národný inšpektorát práce (National Labor Inspectorat). 2005. Doporučenia.

Niemerko, B. 2009. “Taxonomies of educational goals as a lead into creative teacher training“ Polish Journal of Social Science 4 (1), pp. 93-106.

Petlak, E., Komora, J., 2003. „Vyučovanie v otázkach a odpovediach“. Bratislava: IRIS.

Prošek, D. 2010. SM_LPS: Metodika výcviku žiakov/riadiacich letovej prevádzky. Smernica Letové prevádzkové služby SR. Registratúrne číslo záznamu: 05090/2010.

Rešetová, K., 2004. „Informačný manažment ako podpora riadenia vysokých škôl“. In Univerzitné informačné systémy. UNINFOS ´04: medzinárodná konferencia. Bratislava: STU, 2004, s. 224 – 230. ISBN 80-227- 2096-8

Rosa, V., 2007. Metodika tvorby didaktických testov. Štátny pedagogický ústav.

Turek, I., Albert, S., 2005. Kvalita školy. Bratislava: Slovenská technická univerzita v Bratislave.

PRACTICAL EXPERIENCES WITH LEARNING MANAGEMENT SYSTEM MOODLE IN AVIATION TRAINING

RÓBERT JANIGA
MICHAL ROJČEK
IGOR ČERNÁK

Faculty of Education
Catholic University in Ružomberok, Slovak Republic

e-mail of corresponding author: Robert.Janiga@ku.sk, Michal.Rojcek@ku.sk, Igor.Cernak@ku.sk

Key words: Learning Management Systems, Web Based Training, e-Learning.

Abstract: The paper deals with the implementation and sharing practical experiences of the Learning Management System (LMS) Moodle, which was deployed for a specific group of educators. The group consisted of pilots in a private aviation training company where the system is currently implemented and serves as educational support. This specific group of educators required specialized study support according to ICAO (International Civil Aviation Organisation). Examination tools and test sets were produced in standardized form, based on the Ministry of Transport. In the paper we compare the requirements of educator and administrator from the perspective of the system and in terms of e-tutor. To find the suitable system for education and training was necessary to study the concepts of e-learning. The main area that has been studied is WBT - Web Based Training. WBT is a subset of e-learning. It is an ideal tool for providing training for individuals, anytime, anywhere in the world. Advances in technology, computer networks, and improvements in bandwidth deliver unlimited access to multimedia. Web browsers that support 3-D virtual reality, animation, interaction, chats, conferences and real-time audio and video offer unique learning opportunities. With the tools we have available today, we have assembled a highly efficient WBT to meet the needs of training. At WBT it is important that the device on which the web application is operated can be a different type - tablet, mobile phones, laptops, desktops. It contains in addition to text documents various simulation and visualization of selected events. This significantly helps to understand difficult phenomena and systems not only in aviation. The real outcome of this study is a functional educational system developed according to flight standards and deployed in a flight school company. In the paper we will describe the functionality of the system.

Introduction

Pilot training on a specific aircraft type requires specific processes and needs. Our task was to develop a computer system that would be helpful for flight instructors. In particular, it was a graphical representation of the difficult-to-understand aircraft systems, enriching the training with simulation and visualization of L410 aircraft systems. After a thorough analysis of LMS systems, we decided for the LMS Moodle 3.0 and the entire WBT system was built on it. Based on our experience, instructors are particularly satisfied with the possibility of testing, both in the form of progress tests and final tests. The system automatically evaluates individually each student, the instructor can analyse the statistics and track individual student progress in the training. However the new WBT brought more +, more experiences, compared to traditional pilot training, and some weaknesses we discuss in this paper.

Education curriculum

Education curriculum is a summary of educational goals, it speaks complexly about the teaching or learning process and its important points, about the realization and the results.

It goes beyond the curriculum and the education plan. The curriculum includes information about learning objectives, education process, learning organization, teaching and learning methods and resources, and how to review and evaluate.

The curriculum answers the questions: whom, why, how, , when, under what conditions, with what expectations, we will educate.

Measurement of the success of trends in education is then carried out as follows (Degendorfer, Reisch and Schwarz 2000 97; Blaško 2010, 31-32):

- the curriculum intended,

- the curriculum implemented (taught),

- the curriculum achieved (learned).

The content part of the educational standard determines the minimum content of education. The content part is a curriculum that can be edited by all educators (Degendorfer, Reisch and Schwarz 2000, 96).

The performance part is a performance formula that determines the level at which the learner has the minimum knowledge. (Degendorfer, Reisch and Schwarz 2000, 52).

Analysis of specific goals of training modernization and requirements on WBT systm

Modernization and streamlining of aircraft specialist training was the main goal of the project. Specific objectives were set out in the following tasks:

1. to innovate content and methods, improve learning outcomes for the needs of pilots
2. to orient the training of educators to acquire and develop the competencies of their educators to manage modern and effective training
3. to know and identify with general trends in pilot training
4. to manage effective pedagogical planning and documentation processing
5. to manage human management and create appropriate control mechanisms
6. to improve the communication of educators in conducting training and fulfillment of training goals.

Based on the performed analysis, some of the requirements that the electronic education system and the materials should meet are set out. They are in particular:

1. multimediality,
2. interactivity,
3. responsiveness (ability to work on different types of devices),
4. multiuser - multiple users with different rights (admin, lecturer, course creator, student),
5. hypertext / hypermediality,
6. safety,
7. simple backup and recovery from backup,
8. simple attendance for course participants, lecturers and administrators,
9. simple adding of content,

10. internet accessibility,

11. accessibility from portable media CD, DVD, USB flash drive.

Educational system Web Based Training

For Web Based Traning (WBT) we used LMS Moodle (Douglamas 2017) and it enables complete management of the systém. This includes communicating with students, grade reports and statistics for each student. Courses are divided into separate sections (weeks, chapters). It is possible to add different resources and activities. Resources serve for an unrated presentation of learning content. For example, you can insert different files, course websites, Links, video files, audio files and far more. Activities, such as tests, forms, wikies, surveys, questionnaires, assignments, etc. can be evaluated (Duggan 2017).

WBT training software is one of the latest trends in aeronautical training techniques (CAE 2016). The proposed WBT training software is designed to study aircraft systems. A large number of detailed technical illustrations and animations, along with an explanation, guide the user through the course. The powerful and easy-to-use interface enables fast navigation, while bonus features, including interactive content, detailed system diagrams, exam modules, enrich this dynamic learning tool.

The main benefits of WBT in the application are:

- customized solution for organizations using specific aircraft training solutions
- availability - students can access their courses 24/7, from anywhere.
- WBT can be used as an aspect to increase the effectiveness of teaching.
- graphics easily depicts complex and often complicated aircraft systems with even the smallest detail.
- high efficiency. By allowing students to work at their own pace. WBT reduces the amount of time students spend in the class while maintaining the highest retention speed of any other media. WBT can be used both for group training and for individual training.

WBT does not provide an overall training solution, it is always necessary to use a combination of lectures, WBT and practical training.

WBT benefits from web technologies and applications and content, and the whole system is usually stored on a remote computer (server) on the Internet. With WBT, it's important that the devices on which the web app will run may be different - tablets, mobile phones, laptops, desktops.

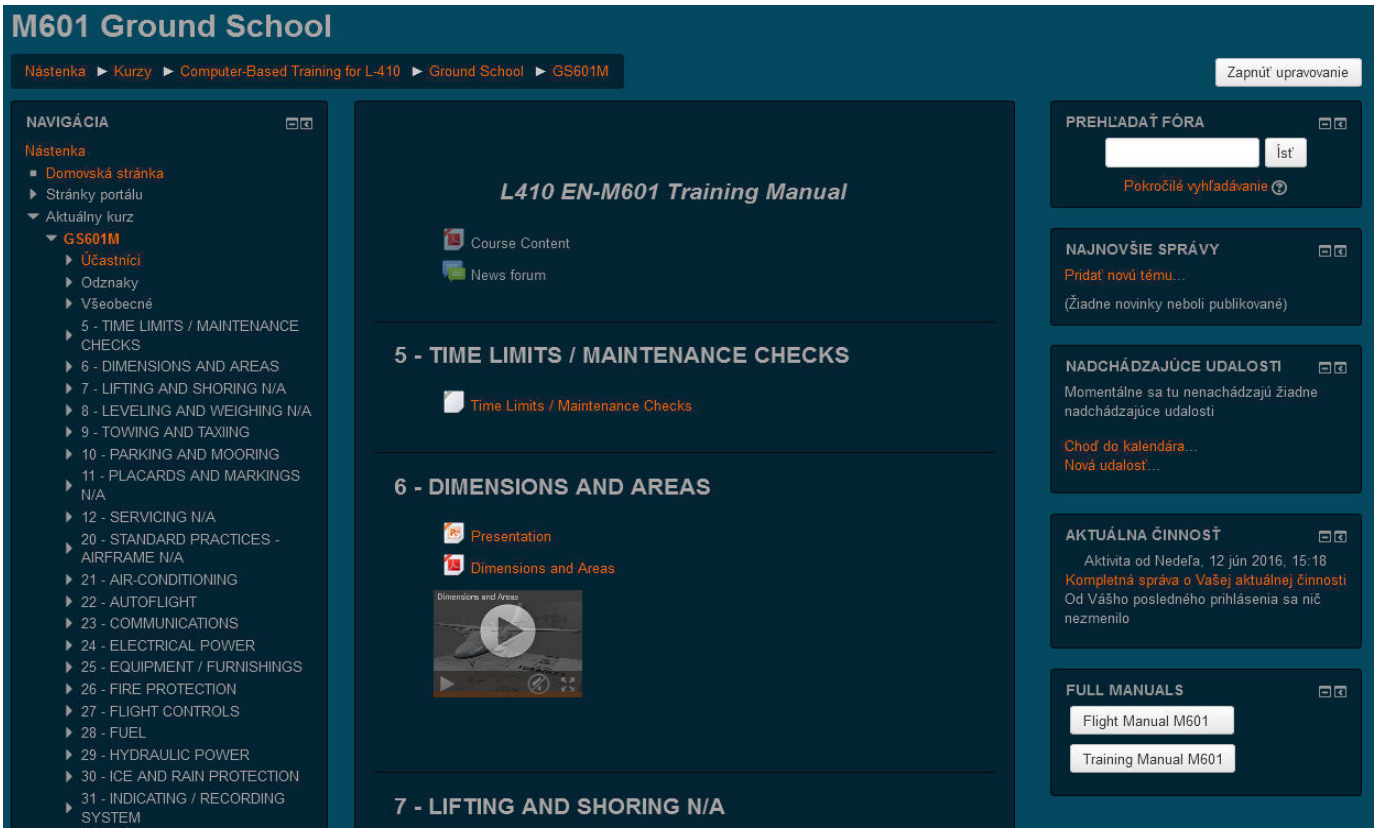
WBT includes, in addition to textual backgrounds, various simulations and visualizations of selected phenomena. This helps to understand the difficult and unclear phenomena and aircraft systems.

WBT is committed to meet the specific objectives of modernizing training, managing effective planning and processing of training documentation. The system also helps in communication of lecturers and pilots jointly with regard to the important competencies that pilots need to acquire and improve in the training process. WBT is enriched with presentations in which students can learn more about the functionality of

different aircraft systems. They visualize various systems and illustrated contexts All courses in WBT are in English.

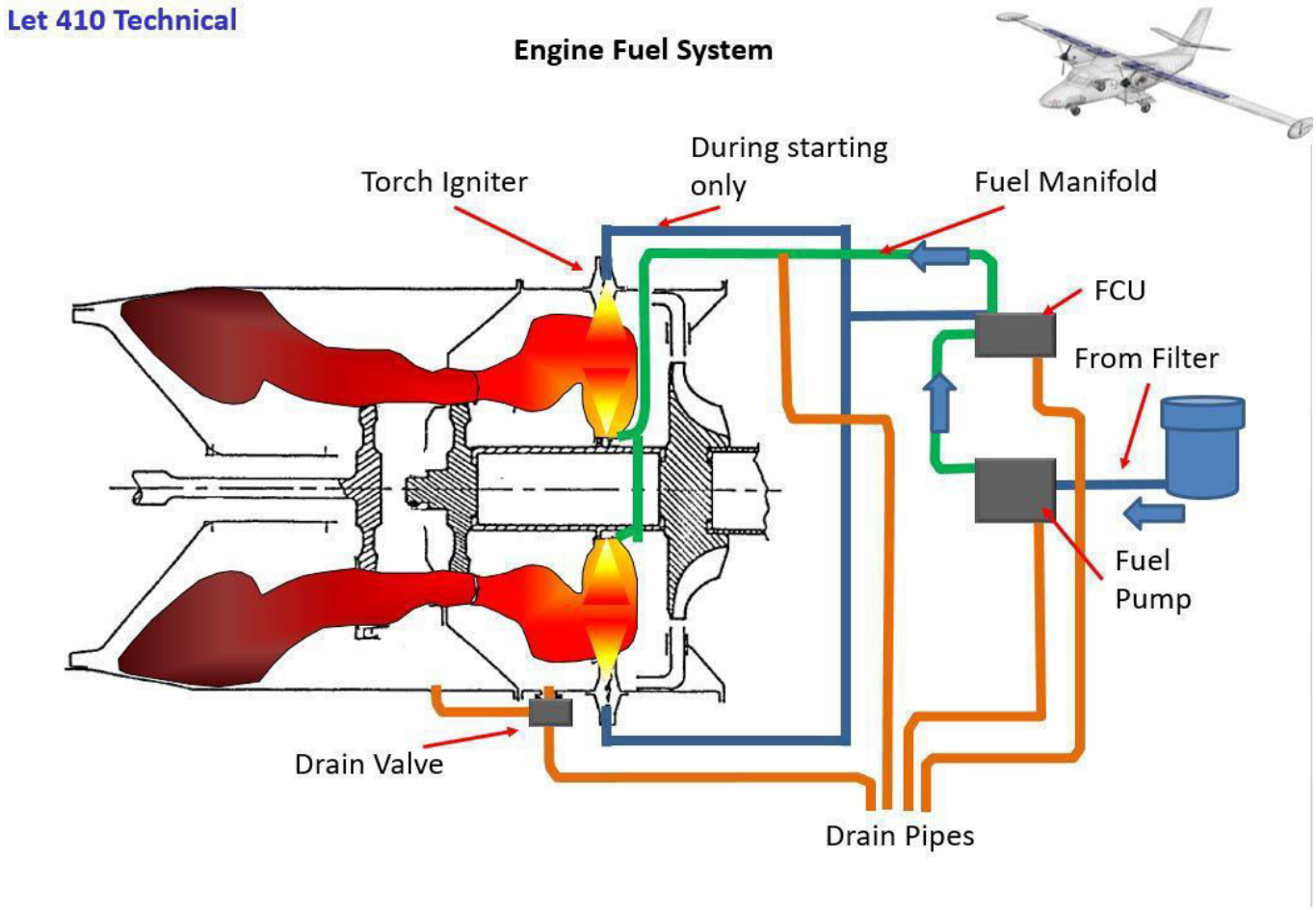
WBT also includes additional study materials such as short videos, service manuals, and a pilot manual (see Picture 1, 2).

PICTURE 1. COURSE PREVIEW (MOODLE SCREENSHOT)



Source: Own

PICTURE 2. FUEL SYSTEM SIMULATION (MOODLE SCREENSHOT)



Source: Own

Additional learning content can be added using external Learning Content Management System (LCMS) tools, thanks to compatibility with the SCORM, AICC, and IMS training standards. Part of the course or the whole course can be integrated into other WBT systems, for example, giving the opportunity to sell part of the educational content to other educational institutions (Douglamas, 2017).

The lecturer has the ability to generate course statistics and see how, when, and where the pilots study. The learning environment is clear, it does not impose any specific requirements on pilots' computer literacy. It requires basic computer skills to control it.

The WBT also has full support for the Competence-Based Education (CBE). This approach allows students to proceed based on their ability to handle skill or competence at their own pace, regardless of the surroundings. This method is adapted to different learning abilities and can lead to more effective learning outcomes.

Conclusions

This article describes the design and implementation of the WBT system for pilot training L 410. In addition, the system has been supplemented with pilot testing capabilities, which includes a large number of questions from individual learning modules. From the extensive question bank is the ability to easily

generate tests. In the system testing phase, airline trainers' comments on design and navigational elements, rating scales, and course management were incorporated.

Acknowledgment

This article was developed as part of the project TA04031376 "Research / development of training methodology of aviation specialists L410UVP-E20". Project TA 04031376 is solved with financial support of TA CR

References

Blaško, M., 2010. „Príprava učiteľov odborných predmetov pre systém riadenia kvality výučby. In modernizace kvality vysokoškolské výuky technických předmětu“. Sborník príspěvku a anotací medzinárodní vedecke konference, Hradec Králove: Gaudeamus UHK, 2010, pp. 31 – 34.

CAE, 2016. CAE and Aviation Performance Solutions now offering Upset Prevention and Recovery Training in Europe http://www.caelearning.com/cae-and-aviation-performance-solutions-now-offering-upset-prevention-and-recovery-training-in-europe/, accessed on 1st April. 2017.

Degendorfer, W., Reisch, R., Schwarz, G., 2000. Qualitätsmanagement und Schulen-twicklung. TheorieKonzept-Praxis. Wein: öbv und hpt,

Duggan, T., 2017. How to Create Computer Based Training Software http://www.ehow.com/how_6520266_create-computer-based-training-software.html, accessed on 3th May. 2017.

Douglamas, M., 2017. About_Moodle https://docs.moodle.org/33/en/About_Moodle, accessed on 2nd May. 2017.

IMPLEMENTATION OF COMPUTER BASED TRAINING INTO BASIC PILOT LICENSE COURSES

DAVID ŠOUREK

Faculty of Transport Engineering
University of Pardubice, Czech Republic

e-mail of corresponding author: David.Sourek@upce.cz

Key words: pilot license, computer based training.

Abstract: The Computer Based Training (CBT) or the Web Based Training (WBT) has been used for various types of training in the field of air transport for a long time. Regrettably, this method of training has been used in most cases only for a theoretical preparation of pilots who apply for some higher pilot license (Commercial Pilot License or Airline Transport Pilot License). Only a few flight schools in the Czech Republic use the CBT for the training of student pilots and for lessons in basic pilot licenses courses (Sailplane Pilot License, Light Aircraft Pilot License or Private Pilot License). Despite the fact that the relevant regulations define the structure and the scope of lessons in the particular courses, there is no publicly accessible CBT course for pilots created by state administration (Czech Aviation Authority) even though the theoretical exams are performed under the supervision of Czech Aviation Authority. For the student pilots, it is very useful to have a possibility to review some parts of the theoretical course or pay more time than it is set by relevant regulations for some lessons. Apart from the fact that CBT can be used for a training of pilots, it is possible to use the CBT for training of other aviation specialists e. g. airline dispatchers. In this case, the situation is the same as in the training of pilots from the Czech Aviation Authority point of view. This paper is focused on processes and procedures which enable the implementation of CBT into the training of pilots and other aviation specialists at different levels. Free access to particular training lessons on the Czech Aviation Authority web page will lead to improvement of the training quality of aviation specialists and to a reduction of unsuccessful theoretical exams attempts.

Introduction

Aviation is often called as the youngest transport sector. Despite this, air traffic transports annually several billion passengers (3,441 billion in the year 2015 - The World Bank Group 2017). There are very high percentages of flights during the year made by airlines and by aircraft with a capacity higher than 20 passengers. It can be concluded that the air transport is predominantly of a mass character. By contrast, passenger road transport is largely individual. This is partly due to the very common ownership of a passenger car in developed countries. This is also related to the fact that possession of a driver's license for a passenger car is perceived almost as a matter of course today. This, of course, cannot be said in relation to pilot licenses. “Driving” of the aircraft thus still belongs to activities that are considered as rather exceptional by the people. Compared with the driver's license, getting a pilot's license is much more costly. Thanks to the current economic growth in developed countries, more and more people can afford to fulfil their "dream" and get a pilot license.

Similarly, to driving licenses in road transport, pilot licenses are divided into several categories. The lowest pilot licenses entitle the holder to pilot light aircraft or gliders (LAPL or SPL licenses). Higher pilot licenses allow to pilot bigger single-engine airplanes in private flights (PPL), or large commercial aircrafts in position of First Officer or Pilot in Command (CPL and ATPL licenses). In addition to these pilot licenses, there are still other qualifications, such as instrument rating (IR), multi-engine aircrafts (MEP) or flying within multi-member crew (MCC). A complete overview of pilot licenses and their requirements in EU countries is provided in EC Regulation 1178/2011. Although the difficulty of obtaining different types of licenses and qualifications differs, one thing is a common for all license types. In order to obtain any

pilot license or qualification, it is necessary to pass the prescribed training. Each training is composed of theoretical training and practical training in the aircraft. The above-mentioned regulation 1178/2011 sets out the minimum scope of training (in hours) in the theoretical and practical part. In the theoretical part, there are mentioned the subjects with which each student pilot must be acquainted during the course. In the case of CPL and ATPL licenses, it is also possible to use the distance form of obtaining a license (according to Appendix III of Regulation 1178/2011). However, this method is not possible for lower license types.

Pilot training

Pilot license applicants are trained in approved training organizations (ATO) or registered training organizations, which are called registered facilities (RF). These two types of organizations differ primarily in their structure, number of employees and types of licenses for which they can undertake training. The ATO or RF operating requirements are defined in EC Regulation 1178/2011. In general, these training organizations can be called as the flight schools. Table 1 gives an overview of the number of flight schools in the Czech Republic and neighbouring countries.

TABLE 1. NUMBER OF FLIGHT SCHOOLS

Country	Number of ATO	Number of RF
Czech Republic	43	137
Germany	79	-*
Austria	48	63
Slovakia	9	21
Hungary	41	7
Poland	150**	

Source: data collected from webpages of national certification authorities
Note: * no RF mentioned in Germany, ** without differentiation ATO/RF.

The difference between ATOs and RFs is also that training in RF is focused mostly on training for non-commercial pilot licenses. Thus, RFs provide training for lower license types (mostly PPLs), while ATOs are predominantly focused on the training of higher licenses (CPL and ATPL). Some ATOs, however, also offer training for lower pilot licenses. RFs can also offer higher licenses, but this is not very common. However, the distribution of ATO and RF training organizations is only temporary. EASA (2012) aimed to train pilots with any type of license only in the ATOs. These organizations would be the only ones that could provide pilot training. Current RFs are now in a transition period when they have to be transformed into ATOs. The final date transformation of all RFs is set to April 8, 2018. However (EASA 2015a, 2016) has reassessed its attitude towards RF transformation to ATO, and suggests that training for non-commercial pilot licenses could continue outside ATOs in organizations called Basic Training Organization, eventually Declared Training organization. It seems that RF will not be transformed into an ATO, but it will probably only change their name to DTO. However, it is already clear that the training will not be affected by these changes (EASA 2015b).

Since the acquisition of CPL and ATPL licenses is also possible through distance learning, some forms of eLearning are used for pilot education in some ATOs. For lower licenses, this form of distance learning is not offered, and therefore, in case of RF, eLearning is used only in rare cases as supplementary study material. The distance form of the study for CPL and ATPL licenses is made possible by the fact that applicants for these types of licenses already have one of the lower pilot licenses. A certain level of knowledge is expected and this level is only extending with the information needed to achieve a higher pilot license. Applicants for higher pilot licenses are primarily people who will later become pilots as their main occupation. It can therefore be assumed that flying is intensively engaged before obtaining a higher pilot license. The knowledge and skills that are acquired are very often applied in practice.

For lower pilot licenses, it is assumed that their holders are engaged in flying mostly in their free time. This may be the reason that some information gained during the training are forgotten due to their rarely use. It is very important for holders of lower pilot licenses to have the opportunity to repeat some parts of the theoretical training. This importance can be supported by the fact that the time between theoretical instruction and the acquisition of a pilot license can be long more than one year. The possibility to repeat any part of the theoretical training in the form of eLearning at any time can lead to the consolidation of already acquired knowledge.

It follows from the above-mentioned text that eLearning is only used in larger ATOs for theoretical pilot training and in most cases only for commercial types of licenses. In case of RFs, the use of eLearning is very rare. However, just for the theoretical training of lower types of licenses for non-commercial pilot licenses, the use of eLearning can be a way of improving education process and increasing the scope and consolidation of theoretical knowledge. The following part will be focused on activities leading to the implementation of eLearning into theoretical training for non-commercial pilot licenses in the RFs.

Using eLearning in pilot training

The use of eLearning has a very long tradition in aviation, as illustrated, for example in (Kearns 2010). The beginnings of eLearning are related to the development and availability of personal computers in the late eighties and early nineties. The primary form of eLearning is called Computer Based Training (CBT). Due to the small number of computers connected to the Internet, individual eLearning courses were distributed via CD-ROM. The user installed the application and then launched the selected available courses. In the CBT, it was relatively difficult to perform the assessment of the mid-term or final tests by the instructor due to the no on-line computer connection. The automatic evaluation was possible, but delivery of the results to the instructor was possible only in off-line form using floppy disks. For free-response tests, feedback took a long time.

With the development of computer technology and the emergence of Internet and Internet technologies, another form of eLearning was developed. This form is called Web Based Training (WBT). The difference between CBT and WBT is that the content of the course is accessible online on a local or remote server and the user accesses courses via a local network or the Internet. Sometimes it is possible to understand the WBT as a subset of CBT, because the principle of learning remains the same, but the form of distribution of the courses and access to them is different. In addition, WBT offers additional tools to better monitor student activities (time spent on the course, returns to some passages, etc.).

Kearns (2010) presents some of the advantages and disadvantages of eLearning as compared to classroom-based teaching. Benefits are:

- cost-efficiency;
- geographic flexibility, as the course can be taken in any location;
- temporal flexibility, as training is available 24/7;
- content standardization between instructors across an entire organization;
- interactive exercises;
- compatibility; software has now become standardized, so practically any computer can run training in an identical fashion;
- immediate learner feedback, tailored specifically to exhibited performance;
- automatic tracking of learner performance within a company-wide database.

The disadvantages of eLearning are:

- course design, creation, and implementation can cost more than the projected savings;
- training success is dependent on the learner's ability to use computers;
- learners require a higher level of motivation and self-direction;
- it is difficult for instructors to ensure that learners are paying attention;
- the learners and the organization must be prepared to accept e-learning;
- learners lose direct contact with their instructor in asynchronous learning environments, or nonverbal cues such as body language and voice inflection in synchronous learning environments.

Due to the development of air transport over the last 20–30 years there has been a need for a higher number of qualified personnel. Large airlines have realized the benefits that eLearning can bring to them, and have decided to implement it into their staff education system. At present, most major airlines use

some form of eLearning (WBT) for various types of staff training. From this perspective, the use of WBT in aviation is not new at all.

As mentioned above, pilot training is in most cases out of the airline structure in the ATOs or RFs. Although some airlines have their training centres, they are not designed to train new pilots, but to maintain the appropriate pilot license through flight simulator training, for example. In the case of large ATOs, some parts of the training of higher pilot licenses are processed in the form of WBT. But what prevents the WBT from being used in RF training for lower pilot licenses? There are several reasons, mainly related to the organizational structure of RF and the number of its employees. For a number of reasons, there is insufficient technical knowledge to deploy WBT by RF staff. Most RF instructors do not have pilot training as their main source of income. It follows that RF instructors may have very different professions, and training of pilots is more devoted to their leisure time. In addition to technical knowledge, there is also a lack of hardware equipment in the RF to deploy WBT. This problem can be solved by hiring the necessary services with specialized organizations, but in the RF it will be necessary to have a person who will take care of the WBT technically.

Another obstacle to deploying WBT in RF is the low experiences with this form of training with instructors. Most instructors are able to use traditional training methods. However, the introduction and use of the WBT would mean that the instructors have to add to their knowledge new training methods. But most of them will not be willing to do this because of the time consuming. Other obstacles include the great time-consuming task of creating one WBT course. However, it is not only the time needed to create the course, but it is also necessary to look at the quality of courses. A high-quality WBT course is not likely to be created by anyone who has no experience with this work.

If RF decides to implement WBT, it has to find answers to a few important questions. First of all, it is necessary to address the question of the economic advantage of WBT deployment and a possible competitive advantage over other RFs. It is also necessary to resolve whether RF will buy its own hardware or rent the services needed to operate WBT from a specialized company. In the case of leasing, attention must be paid to choosing a specialized company and the services that are offered. The other decision the RF must take is related to the Learning Management System (LMS) selection. Moodle, which is available for free under the GNU General Public License, is widely used in this area. However, LMS Moodle is not the only one and it is possible to choose from many other LMS systems.

After the decision to deploy WBT for training pilots in RF, it is also necessary to choose parts of the training that will be processed in the form of eLearning. Not all parts of theoretical training must be appropriate for this form of teaching. It is also necessary to set the priority with which the individual parts

of the training will be gradually processed. To do so, the structure of the courses has to be created or modified. It is also very important to create a uniform look for each part of the course.

It can be seen that for RF the WBT implementation is a demanding and complicated process that does not always produce positive results. Possible barriers to the deployment of WBT not only in the case of RF can be an increased cost of training in connection with the acquisition and maintenance of hardware or its leasing. Also, the long training time and low experience with WBT may be an obstacle to WBT implementation.

For students (pilots), however, there are the following benefits that can be gained through the introduction of WBT:

- own speed of study;
- self-preparation before lesson;
- repeat lessons later;
- visualisation of some principals or processes;
- entire course in one place;
- practical overview of flight procedures (operation before flight and during flight, instrument check, radiotelephony, etc.);
- better theoretical knowledge.

The greatest benefit from introducing of WBT into the theoretical training of lower pilot licenses is the ability to choose your own speed of study. This can be advantageous especially when students with a very different age are enrolled in the course. The rate of understanding and the ability to learn naturally decreases with increasing age. It is obvious that a young student at the age of 20 will learn easier than a student at the age of 40 or more. If these students are together in one class-based course, the older one may slow down the younger and the whole process will be slower. This is no longer the case when using WBT because every student can go through the course as long as he or she chooses. Another indisputable advantage is the possibility to return to the already completed lesson and repeat it if the student has some confusion. Students also have graphical or animated illustrations of some important principles or processes in WBT training. In classical classroom teaching, it may not be easy to create adequate and accurate notes based on the presented pictures and diagrams so that they are understandable to the student in the future. Incorporating relevant graphic objects into the WBT will allow students to study them more closely whenever they need it. All this can contribute to better theoretical knowledge of pilots.

Conclusion

From the above, it is clear that the use of WBT in pilot training has many advantages for students. For training organizations (ATOs or RFs), however, this introduction requires the need to deal with activities they have not yet carried out. The introduction of WBT may not always be beneficial to the training organization, as the funding embedded in the introduction and use of WBT may return for a long time, or may not return at all. There is a question of how to achieve greater WBT expansion in theoretical training (not only) of lower pilot licenses. One possible solution is the introduction of the WBT at the national level, regardless of the training organization. All the necessary (created, available) courses would be accessible on the Czech Aviation Authority website, which is responsible, among other things, for issuing pilot licenses and overseeing civil aviation in the Czech Republic. These courses would be created by collaboration of experienced instructors and WBT courses specialists. The benefits of such a centralized approach would be:

- same level of courses;
- higher level of theoretical knowledge;
- study time control and progress control;
- higher number of successful students;
- better control over education in RF.

Training organizations would thus have an easier role in theoretical training and could concentrate more on practical training. National or European grants could be used to finance the creation of courses at national level. Access to the WBT would be guaranteed to students after their registration with the CAA and would be tied to the commencement of the training. Therefore, courses would not be accessible to anyone, but only to those who initiate pilot training through the training organization. Implementation of this idea and approach will lead to an increase in the theoretical training of pilots in RF, especially in lower pilot licenses. With the same level of theoretical training, it is possible to increase the safety of flying in general aviation. Central deployment of WBT is likely to improve overall theoretical knowledge of students and reduce the number of unsuccessful attempts to get the test from the theoretical part.

References

European Aviation Safety Agency, 2012. “Acceptable Means of Compliance (AMC) and Guidance Material (GM) to Part-ORA, Part-ORA (AMC-GM).” https://www.easa.europa.eu/system/files/dfu/Annex%20to%20ED%20Decision%202012-007-R.pdf, accessed 15th May 2017.

European Aviation Safety Agency, 2015 (a). “Notice of Proposed Amendment 2015–20.” Training outside ATOs. https://www.easa.europa.eu/system/files/dfu/NPA%202015-20.pdf, accessed on 15th May 2017.

European Aviation Safety Agency, 2015 (b). “EASA proposals for Training outside Approved Training Organisations (ATOs) published for consultation.” https://www.easa.europa.eu/newsroom-and-events/news/easa-proposals-training-outside-approved-training-organisations-atos, accessed 15th May 2017.

European Aviation Safety Agency, 2016. “The Declared Training Organisation – EASA proposes European-wide simplified pilot training standards for leisure flying.” https://www.easa.europa.eu/newsroom-and-events/news/declared-training-organisation-—-easa-proposes-european-wide-simplified, accessed 15th May 2017.

Kearns, S.K., 2010. e-Learning in aviation. Ashgate, Surrey, England.

The World Bank Group, 2017. “Air transport, passengers carried – Data”, http://data.worldbank.org/indicator/IS.AIR.PSGR?end=2015&start=1970&view=chart&year=2015, accessed on 30th May 2017.

Languages teaching and learning

IMPACT OF GLOBALIZATION ON LANGUAGE STATUS AND DEVELOPMENT

SEJDI SEJDIU

University of Prizren "Ukshin Hoti"
Republic of Kosovo

e-mail of corresponding author: sejdisejdiu@gmail.com

Key words: impact, globalization, language, technologies, development

Abstract: The advent and growth of globalization has led to permanent impacts on all social, political and economic sectors. The development of effective language learning and adoption methods has been necessitated by growing globalization levels. The changes in the contemporary thinking patterns on language development and use has been facilitated by globalization through the available opportunities to learn and understand different languages. The existing perception and thinking among the population across all countries is that the world is moving towards adoption of a single language due to creation of a global village.

While globalization is attributed to wide language development perception in the present society, new technologies have also provided insights in language use, development and status (Caouette and Kapoor 2016). Additionally, global and multinational institutions have been crucial in advancing the development and adoption of diverse languages for professional and career purposes. Further, new social, political, cultural and economic aspects are proven driving factors for new perceptions that place language as the top agent for all sector development and advancements.

Previous related studies on the impacts of globalization on language development and status perceptions have established the need for authorities to exercise control and manage the use and spread of language use. Language is considered a national heritage as well as a symbol of national unity thus globalization should not be allowed to eradicate such noble roles in the society. This study will adopt a qualitative approach that includes conducting a background examination on the topic, reviewing past literature and collecting data from experts in language development and globalization outcomes. The research findings will provide an actual account of the position of globalization in changing perceptions and development of various languages in the world.

Introduction

Globalization is the dominant feature of the 21st century. Rapid shift in information and communication technologies, trade, and employment opportunities are the vehicles for globalization and the intermixing of peoples and cultures throughout the world. At the same time, the intermixing of peoples and cultures throughout the world is blurring the boundaries that have long defined different cultures and ethnicities. This intermixing is simultaneously beneficial and harmful. It is beneficial because it allows the emergence of a multi-connected world and peoples where race, ethnicity, or social background take a backseat in defining the identity of an individual. New cultures driven by global and contemporary trends are starting to define the new world where values and ideologies of an individual are more important than the background of the individual. At the same time, the new cultures that are byproducts of globalization are harmful to the existing cultural values and system.

A "culture" is the set of system, values, beliefs, religion, and even language that define a particular society. Ancient and indigenous cultures are at risk of extinction because of the new cultures emerging from globalization. One has to understand that globalization is dependent on language compatibility between different groups in the society. Language is a very important factor in the process of globalization. It is apparent that three to four languages have been the key ingredients in the spread and sustainability of globalization. However, the dominance of these languages implies the other languages are at the risk of losing their centrality and sustainability in their communal contexts. Language is a subsystem of culture that is mostly passed orally from one generation to another generation. The daily speak of a language

ensures its survivability and continuance from one generation to another. However, a globalized system encourages the use of a single and common language thus endangering the use, status and development of other languages.

This research paper examines the ways in which globalization as impacted language use and development. This study will adopt a qualitative approach that includes conducting a background examination on the topic, reviewing past literature and collecting data from experts in language development and globalization outcomes. The research findings will provide an actual account of the position of globalization in changing perceptions and development of various languages in the world.

Globalization and Language

"Globalization" as a concept has various interpretations and understandings that depend on the perspectives of an individual. However, it is not an alien topic because its discussion has been a hotbed of academicians from all field in academia. Various interpretations of globalizations have four terms that usually feature in their vocabulary. The four terms include universalism, internationalism, westernization, and liberalization (Marlina 2013). The applicability of these terms depends on the context of the discussion about globalization. Nevertheless, experts on the subject of globalization have agreed that the concept more or less involves the increased porosity of geographical boundaries that allow humans to engage with each other psychologically, physically, culturally, and legally.

Globalization is facilitated by increased human mobility across the globe and the rapid expansion of communication technologies that widen the scope of human interactions. Globalization has seen the intermixing of peoples and cultures. The process of globalization was started from the beginning of time. However, the identity of the concept as most people know it now must have been started in the early 1700s with the increased trans-Atlantic and trans-Pacific voyages by explorers from Europe who wanted to explore new lands for commercial objectives. The colonization of the Americas, Asia, and Africa was the turning point in facilitating globalization to expand with unprecedented speed (Mufwene & Vigouroux 2008).

One has to note that missionary activities had existed prior to the colonization of these parts of the world. However, missionaries had different objectives in their journeys to distant and unknown lands. They only intended to spread the word of their religion. Most missionaries rarely interrupted the cultures, lifestyles, and languages that they found in their areas of interests. In fact, most missionaries strived to interpret their own languages into the languages of the locals in their attempts at integrating into these societies. The colonialists, on the other hand, intended to impose their whole on the indigenous people of the lands they conquered and colonized. Their intention was to impose their culture, lifestyle, and language on the indigenous populations as much as possible at the detriment of the cultures, languages, and social

organizations of the local populaces. The six major countries formerly involved in global colonization include Britain, France, Spain, Italy, Portugal, and the Netherlands. One of the most enduring legacy of their colonization is the languages that their former colonies currently use as their official languages (Mufwene & Vigouroux 2008). For instance, most British colonies use English as the official language, France colonies use French as their official language, and Spain colonies use Spanish as their official language. The trend is the same particularly for the colonies of Portugal and Netherlands.

Globalization and language are two interdependent factors. Globalization depends on the ability of people from different cultures, ethnicities and countries to communicate with each other and understand each other. All the activities mentioned above occur because a common level of understanding is realized. Auditory language is the most efficient and easiest path to understanding each other. The three major spoken languages in the world in the last one decade on sequential order include Chinese (Mandarin specifically), Spanish, and English (Heller 2003).

One has to note that the ranking of these three languages is based on the number of people who speak it as their native language. However, the ranking of a language according to its use as an official language in multi-cultural and multi-ethnic contexts would yield English as the most spoken and written language (Dewey 2007). In fact, recent research studies have revealed that the number of non-native speakers of English is currently more than the number of native speakers of the language. This claim is true considering that even China, a rapidly rising global power, prefers the use of English in communicating with its strategic partner-countries as it drives its expansionist agenda all over the world.

The dominance of the English language at the World stage is wholly attributable to its acceptability as the language of choice for many disciplines in the arts and sciences (Heller 2003). The innovations and knowledge gained from arts and sciences of institutions of higher learning are often published in the English language to facilitate easy interpretation. Consequently, most countries in the World encourage their populations to adopt English as a second or third language to enable them catch up with the latest advancements in arts and sciences (Nunan 2003). However, linguistic experts and anthropologists believe that the use of the English language and the unprecedented growth of globalization is a threat to the native language of populations across the world. This belief may be valid considering that the generation that is currently embracing globalization as an inevitable way of life is the most avid consumer of social media and internet-related technologies. Children as early as 2 years are exposed to YouTube content from all over the World with English being the primary language of navigation and communication. Such a situation implies that the child is likely to learn English terms and phrases before knowing one's native language.

The installment of English as the standard language of instruction in mostly core sciences such as Mathematics, biology, physics, and chemistry in many schools all over the World implies that many students would spend most of their time speaking English as opposed to their native languages. Moreover, the acceptability of English as the common language in international platforms elevates its status compared to the statuses of other languages (Dewey 2007).

Research Hypothesis

This research paper postulates that globalization is not a threat to language threat and development. A review of the above literature suggests globalization and its byproducts have facilitated the popularity and usage of the English language at the expense of the statuses and development of native languages all over the globe.

One has to note that the study considers the increase in popularity of English due to globalization to be accompanied by the reduced adoption of native languages as first languages. Therefore, the research paper analyzes the findings from select papers by experts and researchers who have investigated the influence of globalization on language use and development. The study expects globalization to have an increase in the popularity of English as a global language, but inconsequential to the statuses and development of indigenous languages.

Methodology

A systematic review of articles published by experts on the subject was undertaken. An electronic search of scholarly articles published between 2000 and 2017 was conducted on various such engines and digital libraries such as ProQuest, ebscohost, Scopus, and Thomas Reuters Journal. The search of the articles was not restricted to the English language. The key terms of the research search included "Globalization," "influence," "native language," "native", "Globalization and English language," "teaching English," and "teaching native language." The search criteria yielded 200 articles. However, a further filtration was undertaken where only the articles that contained all the key items, phrases, or Boolean operators were selected for review. Only five articles satisfied all the search criteria.

Findings

Poggensee (2016) conducted a research study to investigate the effect of globalization on the English language learning from a dual perspective of Senegalese learners and American learners. Senegalese learners admitted that learning the English language was a formality in their educational curricular that equipped them for future careers and adaptability to the World. It did not affect their embrace of native and national languages that they had already mastered before starting formal education.

The inevitability of English as a "formal" language is also reaffirmed by Sun (2013). He claims that the Chinese government insistence of the learning of English as a second language in the country is due to its

lingua franca attributes. It presents an opportunity for Chinese nationals as a "cultural capital" for job seekers and "linguistic capital" for student learners (Sun 2013). However, the Chinese government views the opportunity to use English as the "globalization language" to enable Chinese citizens assert their Chinese culture on others. English provides the platform on the globalized stage for other cultures and languages to bridge their attributes to other cultures. Miroslav Černý (2010) acknowledges the threat posed by globalization and English as its counterpart to the status and development of indigenous languages. He proposes an eight-step methodology developed by Joshua Aaron Fishman in recognizing the imminent death of a language and strategies of reversing the death. However, his proposal is suited for areas such as the United States and Australia where the indigenous languages have already been suppressed and negated by dominant Anglo-Saxon languages such as English.

The threat of globalization to native languages depends on the proactive or reactive measures put in place by governments. Findings from an investigative study conducted by David Nunan (2003) to investigate the impact of English as a global language on educational policies and practices of schools in Asia-Pacific region discovered that governments are putting in place differential measures to protect their native languages and, at the same time, accommodate the relevance of English in the global arena. In this case, the teaching of English as a core subject is strictly allowed in instances in which there is a wide community acceptance of the language as an instructional medium. In any case, the locals in the community are comfortable that English is not affecting their children's capacity to communicate in their local dialects. The strategy adopted by many governments in the South-Pacific region aid in the natural development of lcoal dialect while accomodating the inevitability of the English languag as the vehicle of choice for globalization.

A study conducted by Nicholas Ostler (2008) to evaluate the threat posed by globalization on languages concluded that the threat was possible to endangered communities when left unchecked by authorities. However, the severity of the threat depended on the status of the language as a *lingua franca* or mother tongue. The author discovered that languages that are considered mother tongues are thriving in their natural contexts irrespective of the popularity of the English language in their contexts. In fact, globalization is contributing to the development of local and indigenous languages in a reactive manner. In this case, custodians of languages considered mother tongues are counteracting the threat of globalization and its use of English by advocating the adoption of these indigenous languages as part of the language educational curriculums of their schools. More importantly, the imposition of a language as a national language is a guaranteed way of ensuring that the English language as a byproduct of globalization does not negate indigenous languages (Ostler 2008). He also offers a different perspective on the possibilities that the threat of globalization offers for the survival of other languages. In this case, the threat of

globalization leads to the unification of people whose languages are in near extinction leading to their revival instead of demise.

Conclusion

The findings above indicate that globalization and the English language as its facilitator are indeed a force to acknowledge in the survival or demise of other languages. Globalization has increased the popularity of the English language throughout the World due to its *lingua franca* attributes. However, the adoption of the English language as mother tongue in non-English native speaking nations such as Britain, United States of America, and Australia remains a distant dream because of the strong establishment of indigenous languages.

Indigenous languages provide the locals with the opportunity to understand their immediate society and define their identities. People are unlikely to allow the stagnated development of their indigenous languages because they would allowing the extinction of their identities and histories. English represents globalization. However, it is the language of convenience rather than the language of choice of most societies. Other languages will continue to develop as long as people speak these languages as mother tongues instead of *lingua franca*. Furthermore, most nations embrace English as a "formal" language due to its simplicity and acceptance as a global language. In other words, they accept it for its convenience at the global arena. Otherwise, they prefer their native languages for the sustenance of their unique cultures and identities of their nationalities. For that reason, they will mediate in instances in which English threatens to negate their native and indigenous languages.

The findings of this study assert previous findings that confirm the negligible threat posed by globalization in the status and development of native and indigenous languages. However, an important finding of this study is the observance that globalization has increased bilingualism and multilingualism globally. Further research studies need to investigate the effect of bilingualism and multilingualism in developing or destroying non-national languages such as indigenous languages.

References

Alfehaid, A. F. 2014. "The Positive and Negative Effects of Globalization on English Language Teaching and Learning. " Arab World English Journal, 5 (2), pp. 103-109.

Černý, M. 2010. "Language Death versus Language Survival: A Global Perspective, in: "Beyond Globalisation: Exploring the Limits of Globalisation in the Regional Context. Ostrava: University of Ostrava, pp. 51-56.

Dewey, M. 2007. "English as a lingua franca and globalization: an interconnected perspective. " *I*nternational Journal of Applied Linguistics, 17 (3), pp. 332-354.

Heller, M. 2003. “Globalization, the new economy, and the commodification of language and identity. “ Journal of Sociolinguistics, 7 (4),pp. 473-492.

Kapoor, D., & Caouette, D. 2015. Beyond Colonialism, Development and Globalisation. London: Zed Books Ltd.

Marlina, R. 2013. “Globalisation, internationalisation, and language education: an academic program for global education: an academic program for global.“ Multilingual Education, *3*(5), pp.1-25.

Mufwene, S. S., & Vigouroux, C. B. 2008. “Colonization, Globalization and Language Vitality in Africa: An Introduction“, in. S. S. Mufwene, & C. B. Vigouroux (Eds.) Globalization and Language Vitality: Perspectives from Africa. London: Continuum Press, pp. 1-31.

Nunan, D. 2003. “The Impact of English as a Global Language on Educational Policies and Practices in the Asia-Pacific Region.“ TESOL Quarterly, 37 (4), pp. 589-613.

Ostler, N. 2008. “Is it Globalization that Endangers Languages“. Safeguarding endangered Languages UNESCO/UN Conference 27-28 August 2008 . Tokyo: UNESCO/UN, pp. 1-5.

Poggensee, A. 2016, April 22. “The effects of globalization on English language learning: Perspectives from Senegal and the United States. “ Honors Theses. Western Michigan University.

Sun, J. 2013. “Globalization and Language Teaching and Learning in China. “ International Journal on Integrating Technology in Education, 2 (4), pp.35-42.

IMPROVEMENT OF TESTING BY USING LEARNING MANAGEMENT SYSTEM MOODLE

EVA RAKOVSKÁ

Faculty of Economic Informatics
University of Economics Bratislava, Republic of Slovakia

e-mail of corresponding author: eva.rakovska@euba.sk:

Key words: improvement of testing, quality of teaching, LMS Moodle, quiz analysis, quiz statistics

Abstract: Improvement of teaching is a very important task for every teacher. Many years of teaching usually leads to some stereotypes and kills creativity. Creativity of a teacher is not only in the way of communication, preparation of various tasks, exercises, discussions and usage of IT, multimedia, etc., but it is also in the way of Examination and testing. Examination is a time-consuming process, so each teacher tries to make this process easier. Written vs. Oral exam is the frequent question and teachers prefer the written one. The current trend is testing by multiple choice quizzes (MCQ). Even though it seems that MCQ is the most popular one, sometimes the preparation of such a quiz is a difficult task. When a teacher prepares the quiz, he/she needs the "art of asking", which comes from long time experience and various experiments. LMS Moodle can support this "art of asking", because it offers a few tools on how to find the inappropriate or inadequate questions in the quiz. Moodle provides statistical reports with indicators (Crohnbach`s alpha, facility index, discrimination index, effective weight, etc.) The paper brings statistical analysis of concrete quizzes University of Economic Bratislava and analyses the main problems visible in Moodle statistics. When the statistic indicators show some inadequate values, it could be the "bad" question in the actual student group. Many authors recommend eliminating such questions from the quiz. The contribution shows that this approach depends on more aspects, not only on the statistic indicators and outlines the possibility of how to improve the quality of testing. The observation of typical characteristics shows, that here is a possibility to design decision support system implementing in Moodle environment, which could help the teachers find an inconsistencies in quizzes.

Introduction

All teachers, from time to time, confront problems on how to improve their teaching. It is not an easy question, especially at universities. The main principle of how to offer better education for young, creative and intelligent people is to be one step ahead in the domain area. That means to study a lot, find new information, share the information with colleagues, work over the research and increase their own knowledge base. These processes are time consuming; therefore many teachers try to reduce the effort of doing bureaucracy and exam evaluation. After many years of teaching the same subject, it is a big challenge not to lose creativity for preparing an adequate exam; especially at times, when our society discusses decrease in the quality of education. On one hand there exists the pressure to use new technologies, best practices, ready-made solutions, guides for teaching, on the other hand the pressure of how to improve creativity by teaching. Creativity often comes from natural reasoning ability, not from instructions and strict adherence to rules and best practices. Some Slovak universities prefer best practices and rules for the evaluation of students; how to give the final grade, how to divide the weight of responsibilities between the semester work and final exam, etc., and there is a minimum space for using one's own ideas and creativity on how to evaluate the students' work.

The paper comes from experience and long-time observation of the author and her colleagues at the Department of Applied Informatics and has empirical character. It focuses on how to improve the process of preparing good quizzes, which fulfill the attributes such as validity and reliability (Ali, Carr and Ruit 2016), (Prokša 2008). The teachers try to save time and concentrate mainly on the effective evaluation of the quiz, but the process of preparing the quiz requires adequate effort and time too. So the purpose of this

research is to show the main problems in the quizzes and then to suggest how to use LMS Moodle and quiz statistics for improving the quality of the final exam.

Student evaluation at the University of Economics has some rules and one of them is that the students are allowed to gain 40% of the evaluation during the semester and 60% on the final exam. During the semester students usually have some projects and the final exam is a quiz. Many teachers prefer a combination of multiple choice question form of quiz (MCQ) with other exam type. The reason is, as was mentioned before, that it consumes less time correcting the quiz and has an objective assessment (Gavora 2010). For some subjects (programming, database systems, software engineering, etc.) this way of examination seems to be satisfactory, because the work is focused on the IT projects during the semester. But other subjects such as introduction to informatics, introduction to artificial intelligence, formal languages and automata, decision support and more theoretical subjects need a different approach. Older generations of teachers prefer only oral exams or simple written exams with open-ended questions. The younger teachers save their time and the online MCQ with automatic evaluation is the core of an exam. So, they try to combine more types of exams:

- MCQ and oral exam with (one or two fast questions);
- MCQ and written open-ended questions (explain the relationships, sketch the model of something, etc.);
- MCQ and written exercises (logic reasoning, modeling, designing, mathematical expressions, etc.).

It seems that the MCQ is the best solution for IT teachers and they use online testing systems. Many of them have their own online testing system (MCQ is easily programmable), others use the LMS Moodle, which the university has had since 2004. In some cases, the MCQ is a tool for finding out whether the students understand the basic terminology and principles in the subject (e.g., basic informatics, introduction to artificial intelligence, formal languages and automata, information management, etc.). Combining MCQ with other types of examination is very successful, especially in cases, when the first part of the exam is MCQ and receiving a minimum of 50% from the total quiz score is a condition for continuing the exam further. The rules at the University of Economics were changed a few years ago and do not allow the above-mentioned effective exam method. Although the MCQ have a lot of disadvantages (Prokša 2008), (Bontis 2009) and the critics of MCQ say that MCQ can measure only declarative knowledge, not procedural, episodic knowledge or in-depth learning, the combination of MCQ and other types of examination is suitable for the measurement of student knowledge.

As was mentioned before, when somebody teaches an unchangeable subject (as quantitative methods, logic and mathematical principles, programming, etc.) for many years, it raises a problem of how to create a sufficient number of questions for MCQ. Some of the teachers, thanks to many other duties, resigned to change and left the same questions for several years and did not evaluate the quality of these questions. It

brings a typical result: many students get excellent grades and we cannot see the difference between good and worse students, although our experience during the semester is completely different. The typical problems with using MCQ online at universities are:

- There are not so many questions in the question bank, which the students would not be able to remember (as collective memory - many of them repeat the subject several times);
- The teacher often does not have good control over all student activities during the online quiz (badly located computers in the classroom);
- The Slovak students prefer "cooperation during the exam" and cheating, so they are creative by using various technologies (mobile phones, some software, saving print screens, etc.);
- The result of their activities is that they have their own question bank somewhere on a web site as a main learning source. Suddenly, they do not care about the correctness of the answers and they only believe their classmates. This approach is characteristic for IT students and we can often also see the same answers of open-ended questions with the same mistakes.

Multiple choice question quizzes are still very popular, because with respect to some quiz creation principles and further monitoring of statistical indicators it is a strong tool for examination (Burjan 2013). The next section introduces statistical indicators that are useful for monitoring the relevance of the MCQ in a group of students (in current academic year) and explains some examples where the mistakes are in the quiz. The final part of this paper analyzes some examples of statistical indicators and suggests a few pieces of advice on how to monitor the statistical indicators and sketches the possibility of making add-software to LMS Moodle for monitoring the statistical indicators.

Experimental observation and statistical analysis of quizzes

The LMS Moodle offers very comfortable tools for preparing quizzes and teachers can choose which type of questions to use in the quiz (calculated, calculated multi-choice, embedded answers, essays, descriptions, matching, true-false, short answers, multiple choice, etc.). Multiple choice questions (MCQ) are the most favourite, since they seem to be very clear for both teachers and students. In the next part it is shown that teachers often have a problem with preparing a quiz that contains mutually independent questions and fulfils some taxonomy of educational objectives such as Bloom's taxonomy or Niemierko's taxonomy (Genči 2007). Table 1 contains some chosen statistical scores for basic quiz structure analysis (Moodle euba.sk). Table 1 offers 11 different quizzes (MCQ1-MCQ11) from 6 subjects concerning IT and some of them were for small groups of students (8-10), some for middle groups (up to 30 students) and two were for more than one hundred students. Also, we chose the MCQ with a simple answer with one attempt for each student (we have more MCQ-simple answer quizzes on Moodle than MCQ multi-selection). One quiz is MCQ10 multi-selection with one or two right answers and 3 attempts for each

student and the MCQ11 from SWI2 is a quiz with more types of questions (MCQ, true-false, matching). In the last column of the table the reader can see values that are recommended for multiple choice questions (Moodle org 2010) which correspond to Cronbach`s alpha recommended values in (Wells and Wollack 2003). Web page Moodle.org (Moodle 2013) very briefly offers the meaning of statistical indicators that are used for quizzes and offers recommended values for MCQ with simple answer, too (Moodle 2010).

TABLE 1. LMS MOODLE STATISTICS FOR QUIZZES WITH CHOSEN SCORES

QUIZ NAME	MCQ1	MCQ2	MCQ3	MCQ4	MCQ5	MCQ6	MCQ7	MCQ8	MCQ9	MCQ10	MCQ11	REC VAL.
COURSE NAME	KMT	KMT	UIES 1	UIES 1	UIES 1	UIES 2	UIES 2	OBIS	OBIS	WAD	SWI 2	
N. OF COMPLETE GRADED HA	7	6	15	7	8	29	10	18	11	110	157	---
TN OF COMPLETE GRADED ATTEMPTS	7	6	15	7	8	29	10	18	11	122	203	---
AVER_ GRADE OF HGA	66.07%	56.25 %	56,67 %	87,14 %	53,33 %	65.29 %	65.00%	69,13 %	68,83 %	67,92%	67,75 %	50-75%
MEDIAN GRADE FOR HGA	75.00%	56.25 %	55,00 %	90,00 %	56,67 %	70.00 %	65.00%	69,29 %	72,86 %	67,50%	67,50 %	---
STANDARD DEVIATION FOR HGA	15.67%	18.96 %	14,21 %	11,13 %	17,71 %	11.11 %	6.53 %	12,92 %	12,34 %	8,98 %	12,38 %	12-18%
SCORE DISTRIBUTION SKEWNESS FOR HGA	-1,450	0,774	0,290	-0,249	-0,618	-1,525	0,444	-0,414	-0,994	0,267	0,169	-1 TO 1
SCORE DISTRIBUTION KURTOSIS FOR HGA	0,521	0,284	-0,948	-0,944	-0,606	3,901	-0,290	-0,507	0,450	0,179	-0,523	0 TO 1
COEFFICIENT OF INTERNAL CONSISTENCY FOR HGA	45.02%	9.94 %	59,58 %	4,27 %	72,16 %	53.48 %	-61.48 %	53,79 %	60,67 %	-12,40 %	18,74 %	64-75%
ERROR RATIO FOR HGA	74.15%	94.90 %	63,58 %	97,84 %	52,77 %	68.21 %	127.07 %	67,98 %	62,71 %	106,02 %	90,15 %	---
STANDARD ERROR FOR HGA	11.62 %	17.99 %	9,04 %	10,89 %	9,34 %	7.58 %	8.29 %	8,78 %	7,74 %	9,52 %	11,16 %	NOT BELOW 5% OR 6%
NUMBER OF QUESTIONS	8	8	25	10	25	21	21	22	22	20	21	---
GROUP OF STUDENTS (EXTERNAL, DAILY, ALL, ERASMUS)	ERAS	ERAS	DAILY	EXT	DAILY	DAILY	ALL	ALL	ALL	ALL	ALL	---

Source: data from Moodle of UEB, available on http://moodle.euba.sk

Quiz attributes such as validity and reliability (Ali, Carr and Ruit 2016), (Wells and Wollack 2003) are not mentioned explicitly in Moodle statistics, although they are important and has relationship to items of statistical indexes. Monitoring them is not easy in the daily rush at the university, but from time to time it is necessary to follow the rules and advice concerning these attributes. "Validity is defined as "the degree

to which evidence and theory support the interpretations of test scores for proposed uses of tests" (NCBI 2015) and is not measurable. On the other hand, reliability is measurable (Turňa 2012) and it depends on the "technical issues" in the MCQ. It is measurable by using several statistical indexes (e.g., by using Cronbach's alpha coefficient as Coefficient of internal consistency in the Moodle), which are able to measure the quiz's consistency. Usually, the alpha in this coefficient is sensitive to the number of items in the quiz. However, there is some advice on how to avoid the problem with consistency (Statistics How to 2014), Surintorn Suanthong (Suanthong 2008) writes "After having worked with many tests over the years, the impact of measurement error on test reliability has become extremely clear. It is also my observation that the quality, rather than the number of items, is the key to reducing measurement error and improving test reliability". From Suanthong's citation it is clear that the internal consistency of a quiz is very important. From the practical point of view, the internal consistency of a quiz shows the independence or the relations between the quiz questions. Table 1 shows us also the Coefficient of internal consistency for highest graded attempt (in the case of one attempt is it clear). When we compare the recommended value with the quizzes' values, it is more than clear that the main problem with our MCQ is the internal consistency of quizzes. Moodle.org writes: "Coefficient of internal consistency (CIC): It is impossible to get internal consistency much above 90%. Anything above 75% is satisfactory. If the value is below 64%, the test as a whole is unsatisfactory and remedial measures should be considered." From this point of view, our quizzes are "out of range" (Moodle.org, 2010). For better imagination, Table 2 includes only Cronbach's alpha without % and Picture 1 "translates the quantitative values into the qualitative linguistic values" and here is a possibility to compare the values of MCQ's with the linguistic values.

TABLE 2. LMS MOODLE CRONBACH`S ALPHA FOR OUR QUIZZES

QUIZ NAME	MCQ 1	MCQ 2	MCQ 3	MCQ 4	MCQ 5	MCQ 6	MCQ 7	MCQ 8	MCQ 9	MCQ 10	MCQ 11
COURSE NAME	KMT	KMT	UIES1	UIES 1	UIES 1	UIES 2	UIES 2	OBIS	OBIS	WAW D	SWI 2
CRONBACH`S ALPHA FOR OUR QUIZZES	0,450	0,099	0,596	0,043	0,722	0,535	-0,615	0,538	0,601	-0,124	0,187

PICTURE 1. A RULE OF THUMB FOR INTERPRETING ALPHA FOR DICHOTOMOUS QUESTIONS (I.E. QUESTIONS WITH TWO POSSIBLE ANSWERS) OR LIKERT SCALE QUESTIONS

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

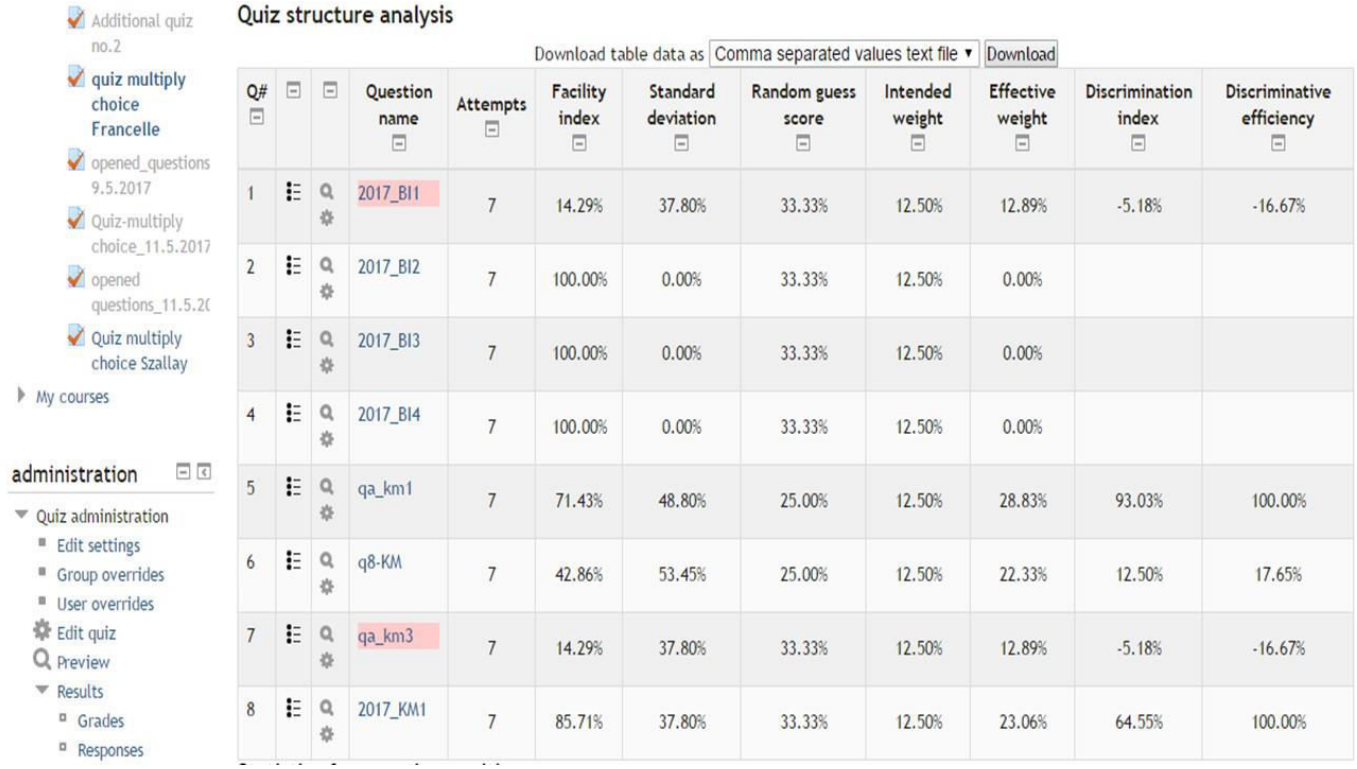
Source: Cronbach's Alpha: Simple Definition, Use and Interpretation avialable on http://www.statisticshowto.com/cronbachs-alpha-spss/

The chosen quizzes have problems with consistency because of the following:

- MCQ5 has the best CIC – it is an old quiz (prepared before 5years), the students expected some of the questions (collective memory is a very strong tool for learning), it was the first quiz from the subject and questions are not arranged randomly;
- MCQ3 was the follower of the MCQ5 and contains a few of the same questions (not arranged randomly);
- MCQ1,2,4 do not contain enough items (questions);
- MCQ6,7 are old quizzes, randomly arranged questions for each student in a different way;
- MCQ8,9 have a relatively good coefficient, the quizzes are new and the teacher focused more on the consistency of the quizzes (didn't use statistical methods, only pedagogical experience and intuition), the questions are arranged randomly for each student in a different way;
- MCQ10 - here the questions are chosen randomly from the question bank of the subject (one question from one category);
- MCQ11 is the quiz with the best other scores and random questions, so randomization could be the reason for not good consistency. This quiz was prepared by the teacher with long time experience with testing.

Table 1 and CIC is only the first step in analyzing the problems in MCQ quizzes. When we want to improve testing, we need to know more about each question. Moodle offers more detailed question statistics (Facility index, Standard deviation, Random guess score, Intended weight, Effective weight, Discrimination index, Discrimination efficiency.

PICTURE 2. QUESTION STATISTIC FOR MCQ1 FOR SUBJECT KNOWLEDGE MANAGEMENT TECHNOLOGIES



Q#	Question name	Attempts	Facility index	Standard deviation	Random guess score	Intended weight	Effective weight	Discrimination index	Discriminative efficiency
1	2017_BI1	7	14.29%	37.80%	33.33%	12.50%	12.89%	-5.18%	-16.67%
2	2017_BI2	7	100.00%	0.00%	33.33%	12.50%	0.00%		
3	2017_BI3	7	100.00%	0.00%	33.33%	12.50%	0.00%		
4	2017_BI4	7	100.00%	0.00%	33.33%	12.50%	0.00%		
5	qa_km1	7	71.43%	48.80%	25.00%	12.50%	28.83%	93.03%	100.00%
6	q8-KM	7	42.86%	53.45%	25.00%	12.50%	22.33%	12.50%	17.65%
7	qa_km3	7	14.29%	37.80%	33.33%	12.50%	12.89%	-5.18%	-16.67%
8	2017_KM1	7	85.71%	37.80%	33.33%	12.50%	23.06%	64.55%	100.00%

Source: Moodle course: Knowledge management technologies 2017, teachers Hudec, Rakovská, available on http://moodle.euba.sk

Picture 2 is a screen shot from Moodle UEB and contains the mentioned question statistics for MCQ1 (downloaded from Moodle of UEB). MCQ1 was chosen, because it does not have many questions and because it is suitable for the purpose of this paper. Quiz MCQ1 was prepared for Erasmus students ("weak" group of 25 students). Eight questions from the subject Knowledge management technologies were chosen from two categories:

1. Business intelligence category-focuses on fuzzy values and fuzzy logic in business and economy;
2. Knowledge management technologies category-focuses on basic definitions and on modeling the knowledge for IT.

The main problem visible in table 2 in Picture 2 is that some of the questions are too easy (numbers 2,3,4) and have no impact on discrimination between students (so there are no values such as Discrimination index and Discrimination efficiency) and the Effective weight is 0%. The Moodle.org is very well usable for teachers, who can see the appropriate values of the Facility index and Discrimination index in comparison with the correct values in Picture 3.

PICTURE 3. VALUES OF FACILITY INDEX AND DISCRIMINATION INDEX FOR QUESTION STATISTIC ANALYSIS

Facility index

F	Interpretation
5 or less	Extremely difficult or something wrong with the question.
6-10	Very difficult.
11-20	Difficult.
20-34	Moderately difficult.
35-64	About right for the average student.
66-80	Fairly easy.
81-89	Easy.
90-94	Very easy.
95-100	Extremely easy.

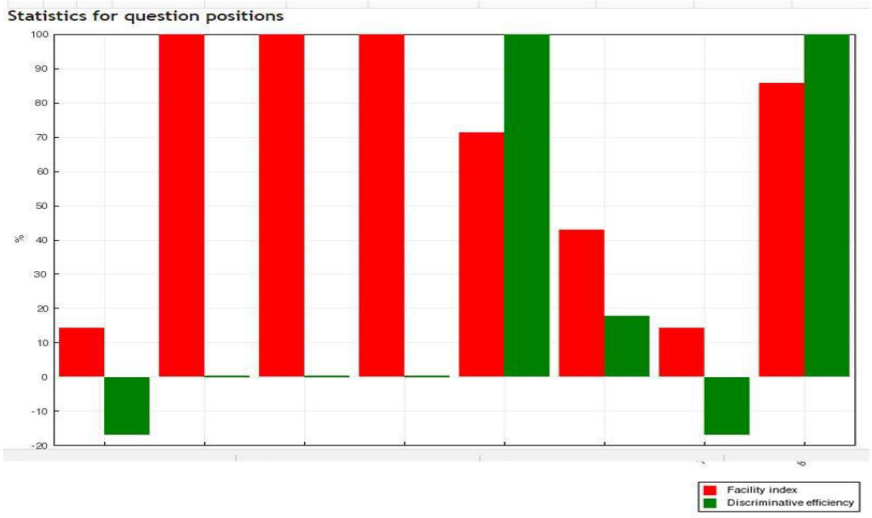
Discrimination index

Index	Interpretation
50 and above	Very good discrimination
30 – 50	Adequate discrimination
20 - 29	Weak discrimination
0 - 19	Very weak discrimination
-ve	Question probably invalid

Source: Quiz report statistics on Moodle.org, available on: https://docs.moodle.org/dev/Quiz_report_statistics

So in the MCQ1 quiz, there are 3 very easy questions (2,3,4), 2 questions (1,7) with the Facility index between 11-20%, which means that these questions are difficult for students, and the last 3 questions could be relevant for the discrimination index and efficiency too. Such an easy comparison brings the teachers a fast view on which questions are not relevant for examination in the future, even though it seemed that the group of student is very ”weak“. Maybe the students only pretended to be ”weak students who do not understand maths“ and the result brought them success. They passed the final exam because 3 out of 8 questions were very easy. It is a very good example of how the students can influence the quiz design. The tables in Picture 3 could again lead to preparation of evaluation rules for better quality of testing.

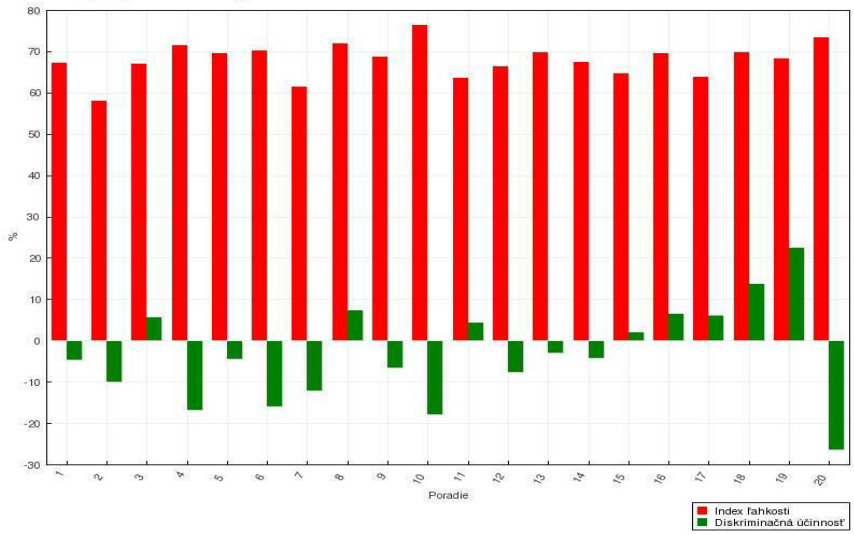
PICTURE 4. CHART OF STATISTICS FOR QUESTION POSITIONS (QUIZ MCQ1)



Source: data from Moodle of UEB, available on http://moodle.euba.sk

Picture 4 gives us a better perception of the questions` statistics. There is a chart "Statistics for question position" in Picture 4 for quiz MCQ1. Similarly, Picture 5 contains the chart for quiz MCQ10 and that is an example of an incorrectly designed quiz. The green part of the chart tells us that the Discrimination indexes are not suitable. It corresponds to values of Facility indexes of all the questions (although here are some vagueness) (Moodle.org 2010). MCQ10 is a very easy quiz for students. This quiz has 3 attempts for each student and is opened for a long time, so the question arises: does the time duration and number of attempts have an impact on the Facility index and Discrimination index? IT students are very clever when they want to cheat and the online quizzes allow them to share information and answers very fast (usually there are no restrictions on web sites in the classrooms). It seems that it has an impact on the Facility index as well.

PICTURE 5. CHART OF STATISTICS FOR QUESTION POSITIONS (QUIZ MCQ8)



Source: data from Moodle of UEB, available on http://moodle.euba.sk

As the Moodle.org writes: "The weakness of this statistic is that, unless the facility index is 50%, it is impossible for the discrimination index to be 100%, or, to put it another way, if Facility index is close to 0% or 100%, Discrimination index will always be very small. That makes interpreting this statistic difficult." (Moodle.org, 2010) This issue is visible in Table 3 (quiz structure analysis), which contains values for statistical scores of the quiz MCQ8.

TABLE 3 QUESTIONS` STATISTICS FOR QUIZ MCQ8-QUIZ STRUCTURE ANALYSIS

Q#	QUESTION TYPE	QUESTION NAME	ATTEMPTS	FACILITY INDEX	STANDARD DEVIATION	RANDOM GUESS SCORE	INTENDED WEIGHT	EFFECTIVE WEIGHT	DISCRIMINATION INDEX	DISCRIMINATIVE EFFICIENCY
1	MULTIPLE CHOICE	Q8_CIA	18	33.33 %	48.51%	33.33 %	4,29%	7.14%	46.40%	63.76%
2	MULTIPLE CHOICE	Q9_HIZ	18	83.33 %	38.35%	25.00 %	5,71%	CERTIFICATE COVERAGE OF THE TOTAL EVALUATION	-27.63%	-38.11%
3	MULTIPLE	Q1-HIZ	18	50.00 %	51.45%	33.33 %	2,86%	4.09%	16.20%	19.08%
4	MULTIPLE	Q10_MTBF	18	94.44 %	23.57%	33.33 %	5,71%	4.21%	21.60%	38.81%
5	MULTIPLE	Q15_SECUR	18	72.22 %	46.09%	25.00 %	4,29%	3.41%	-1.27%	-1.58%
6	MULTIPLE	Q18_SECUR	18	72.22 %	46.09%	25.00 %	5,71%	6.11%	14.10%	18.45%
7	MULTIPLE	Q2_KR	18	38.89 %	50.16%	33.33 %	4,29%	2.24%	-11.04%	-14.15%
8	MULTIPLE	Q20_HIZ	18	33.33 %	48.51%	25.00 %	4,29%	1.40%	-13.73%	-17.92%
9	MULTIPLE	Q21_SECUR	18	27.78 %	46.09%	50.00 %	4,29%	5.41%	20.98%	30.12%
10	MULTIPLE	Q22_KRY	18	94.44 %	23.57%	33.33 %	5,71%	2.30%	-1.08%	-1.98%
11	MULTIPLE	Q6_INTRO	18	55.56 %	51.13%	25.00 %	4,29%	7.01%	39.78%	45.84%
12	MULTIPLE	Q5_INFAKT	18	72.22 %	46.09%	25.00 %	4,29%	7.32%	54.55%	70.07%
13	MULTIPLE	Q11_CIA	18	88.89 %	32.34%	33.33 %	4,29%	4.43%	23.75%	36.40%
14	MULTIPLE	Q13_KRY	18	66.67 %	48.51%	25.00 %	4,29%	5.22%	15.80%	19.77%
15	MULTIPLE C	Q19_	18	72.22 %	46.09%	20.00 %	4,29%	6.48%	38.03%	50.11%
16	MULTIPLE CHOICE	Q23_CIA	18	77.78 %	42.78%	25.00 %	4,29%	7.29%	60.69%	85.79%
17	MULTIPLE CHOICE	Q24_INTRO	18	94.44 %	23.57%	33.33 %	2,86%	2.98%	26.62%	48.72%
18	MULTIPLE CHOICE	Q25_MTTR	18	77.78 %	42.78%	25.00 %	4,29%	4.53%	12.86%	17.41%
19	MULTIPLE CHOICE	Q26_INTRO	18	66.67 %	48.51%	25.00 %	4,29%	7.03%	44.30%	53.85%
20	MULTIPLE CHOICE	Q27_HIZ	18	88.89 %	32.34%	33.33 %	4,29%	1.44%	-7.14%	-11.31%
21	MULTIPLE CHOICE	Q28_KRY	18	94.44 %	23.57%	33.33 %	5,71%	5.49%	45.43%	100.00%
22	MULTIPLE CHOICE	Q29_KRY	18	44.44 %	51.13%	33.33 %	5,71%	4.48%	-6.29%	-7.51%

Source: data from Moodle of UEB, available on http://moodle.euba.sk

LMS Moodle offers a more detailed view on each question. In the downloaded excel file the sheets contain not only the quiz information and quiz structure analysis, but also more details on each question (each question is on one sheet). Table 4 shows the statistics of the next question:

Which of the following statements is true?

3. With BI, firms can realise payment in a secure way.
4. BI helps firms to see trends of sold products by regions.
5. BI is a powerful decision making system.

TABLE 4 DETAILS ABOUT QUESTION "2017_BI1"			
MODEL RESPONSE	**PARTIAL CREDIT**	**COUNT**	**FREQUENCY**
WITH BI, FIRMS CAN REALIZE PAYMENT IN A SECURE WAY.	0.00%	0	0.00%
BI HELPS FIRMS TO SEE TRENDS OF SOLD PRODUCTS BY REGIONS.	100.00%	1	14.29%
BI IS A POWERFUL DECISION MAKING SYSTEM.	0.00%	6	85.71%
[NO RESPONSE]	0.00%	0	0.00%
Source: data from Moodle of UEB, available on http://moodle.euba.sk			

The problem is that we need to download excel files for each quiz separately and then to find each item for a question in a large file.

Although LMS Moodle offers very good statistics that are visible very fast, many teachers do not use it. The reasons are as follows:

- They use the LMS Moodle as a tool for simplifying their work without interest in quality of teaching and testing;
- They look at quizzes` statistics, but they do not understand (usually teachers who do not like quantitative methods and teach subjects such as law, business, marketing, etc.);
- They understand the quizzes` statistics, but to study it and compare many tables that are downloaded from Moodle, is often very complicated and it takes a lot of time to process.

Results and discussion to experimental observation

As we could see, the LMS Moodle offers some statistical data for teachers and is a good base for further research in the field of statistical analysis. Here are some problems with processing the statistics from the Moodle:

- Downloaded statistical reports for each quiz are in one separated file; we cannot gain the statistic reports for example for all questions in question bank together; for comparison of the results we need other software or we have to evaluate data in an experimental way;
- Statistical reports that are accessible for teachers in the Moodle (user login as teacher) are not always relevant for all researches;

- Statistical data are only one side of the possibility how to measure the quality of quizzes, but they do not include for example the quality of students` groups, impact of the number of attempts, impact of quiz duration, the quality of question weight etc.;
- Dependencies between statistical data are not always visible or exact (in cases, where there is no mathematical expression of the relationship between the data);
- Hidden relationships between questions are not always visible; conditionality of questions is a big problem in developing quizzes (Turňa 2014).

Here we have two results from long time observation:

As my colleague Turňa (2012) writes, although we use e-learning tools, serious evaluation of final exams is always complicated. Usage of e-learning tools for online quizzes is not a reason for forgetting that the base of online testing is well-designed quizzes and then their monitoring. Necessity of changing the questions comes from many factors (collective memory of students, evolution of knowledge domain in a subject, changes in the learning process of students, etc.). So the first result is a number of recommendations for teachers, based on observations of their own work yearly after final exams. Usage of the statistical tools on LMS Moodle, which are offered under the option "Results" of the quiz is important, because it allows for keeping the questions in the quiz up-to-date. This means keeping in the quiz the questions with some impact on reliability and validity of the quiz.

What to follow in Moodle statistics? The grades are important, but the grades do not correspond to the quiz quality. Here it is not important to understand the statistics very well and the teachers can see some scores from the Table Quiz information (Table1), but as was mentioned above, the first view should be on CIC - Coefficient of internal consistency and comparing the value of CIC with the recommended values on the Moodle.org web page (right column of Table1). Second step is to observe the table with Quiz structure analysis (see Picture 2 or Table 3) and thanks to the Facility index and recommended values on Moodle.org (Picture 3), is it possible to find out if the question is extremely easy or extremely difficult for the tested group of students. Certainly, when for one question, the Facility index value is between 95-100%, for more groups of students (in various quizzes), it is extremely easy and has no relevance for test quality. Similarly, the same applies for the extremely difficult questions if the Facility index is less than 5% (see Picture 3, Table 2). Some authors recommended leaving out the extreme questions from the quiz. When we use LMS Moodle, a better solution is to create one category of questions in the Question bank, where these extremely difficult and extremely easy questions will be stored. Such questions can be used during the semester for verifying whether the current student group is better (or worse) than the previous ones.

For more detailed result - if it is good to delete the question from the question bank - is watching the partial statistics for only one question (click on the name of question in the table Quiz structure analysis) and look at the frequency of responses to the question. This way of improving the quality of testing is easy and does not consume that much time. Surely, for those teachers who are familiar with statistics and have enough time, other values from the Quiz structure analysis are useful as well.

The second important result is the possibility of developing support decision systems (recommender systems) for making some changes in the quizzes in the future. This question is not so easy, because the main problem is how to involve the non-measurable items into the system. We have a few possibilities: to use fuzzy logic and switch the non-measurable values into fuzzy sets and create some fuzzy rules (Hudec 2016). Another way is to combine the statistical and fuzzy logic approach or take a theory of expectation. All these approaches (and others too) are the subjects for further research at our department.

Conclusion

The paper is concerned with the structural analysis of quizzes from the point of statistics that are available in the LMS Moodle. It follows up on the main idea of how to improve the quality of student testing with the usage of reports and statistical tools in Moodle. All analyses were focused only on Multiple Choice Question quizzes, because this part of statistics in the Moodle is the most used one for examination and it is the most elaborated. Large variability of quizzes in the Moodle opened the topic for further research. There is a group of teachers at our Department of Applied Informatics who deal with quality of assessment (Turňa 2015b), (Misutova and Misut 2014) and with problems and possibilities of expressing a qualitative form of evaluation by quantitative assessment (Turňa 2015a). LMS Moodle is free and open source software learning management system, which is built by the Moodle project (Moodle.org). Compared to a commercial LMS, it is not so comfortable to use and to find all the functions and to get fast and accurate support or advice to do something special. But a great advantage is the possibility to work with Moodle database and to process data for concrete purpose. Data as usually contains many useful information, so here is a probability to find some information about quality of student groups or about previous subjects, which the students had before.

It seems that the problem of appropriate student evaluation is not the problem only for young teachers. The teachers have to deal with many responsibilities during the academic year (lead projects, research, lead the master thesis, doctoral works, teach, make a reviews, organize a conferences, workshops, learn themselves, improve their subject etc.) so there is not enough space and time to study statistical scores of quizzes in the Moodle. It shows, that the development and implementation of the recommender system for quiz quality in the Moodle could be very valuable. Usually the recommender systems are rule-based fuzzy systems, so our idea is the same: to use fuzzy values for qualitative items for creating fuzzy rules. But here is important to gain a good interpretation of statistical data (e.g. values of Facility index, Discrimination

index, Discrimination efficiency etc.). It is possible also from Moodle.org web site or other sources. As was mentioned before, the problem of student evaluation is complex and includes many items such as quality of student group, which depends on wider social environment and previous student learning experience. Finally the process of student evaluation has own hidden dynamic with many items and to implement such recommender system is a great challenge.

References

Ali, S.H., Carr, P.A., Ruit, K.G., 2016. "Validity and Reliability of Scores Obtained on Multiple-Choice Questions: Why Functioning Distractors Matter", Journal of the scholarship of teaching and learning, 2016, http://josotl.indiana.edu/article/view/19106/27131, accessed 15th April 2017

Beckman, T. J., Cook, D. A., 2007. "Developing scholarly projects in education: A primer for medical teachers", Medical Teacher, 29:2, 210 – 218, http://dx.doi.org/10.1080/01421590701291469, accessed on 15th May 2017-

Bontis, N., Hardy, T., Serenko, A., 2009. "Techniques for assessing skills and knowledgein a business strategy classroom ", Int. J. Teaching and Case Studies, Vol. 2 (2), pp. 162-180, http://profs.degroote.mcmaster.ca/ads/nbontis/ic/publications/IJTCSBontis2-2.pdf acceessed on 15th April 2017.

Burjan, V., 2013. "Školské testy – dobrý sluha, zlý pán" https://www.tyzden.sk/spolocnost/22334/skolske-testy--dobry-sluha-zly-pan/ accessed on 5th May 2017.

Gavora, Peter a kol. 2010. Elektronická učebnica pedagogického výskumu. [online]. Bratislav: Univerzita Komenského, http://www.e-metodologia.fedu.uniba.sk/, accessed on 5th May 2017.

Genči, J., 2007. "Some considerations about knowledge assessment", http://virtuni.eas.sk/rocnik/2007/pdf/fid000271.pdf, accessed on 15th May 201.7

Hudec, M., 2016. "Fuzziness in Information Systems, How to Deal with Crisp and Fuzzy Data", in: Selection, Classification, and Summarization", Springer International Publishing, Switzerland.

Lavický, T., "Tvorba a využívanie školských testov", Metodicko-pedagogické centrum Prešov, http://www.mcpo.sk/downloads/Publikacie/PrirodPred/PPCHE200501.pdf , accessed on 15th April 2017.

Moodle.org, 2013, "Quiz statistics calculations", in Category Moodle 2.0 https://docs.moodle.org/dev/Quiz_statistics_calculations#Facility_index, accessed on 1st May 2017.

Misutova, M. and M. Misut, 2014. "Assessment with Information Technology Support", in: D. Ozcan (Ed.) EdFirst Global Conference on Contemporary Issues in Education (Globe-Edu 2014), ELSEVIER SCIENCE BV: Las Vegas, NV. pp. 300-305.

NCBI, 2015. Overview of Psychological Testing, in Psychological Testing in the Service of Disability Determination.National Academy of Science (US), https://www.ncbi.nlm.nih.gov/books/NBK305233/, accessed on 1st May 2017.

Prokša, M., Held, Ľ. and col., 2008. "Vedomostné (didaktické) testy", in: Metodológia pedagogického výskumu a jeho aplikácia v didaktikách prírodných vied." Bratislava: Univerzita Komenského v Bratislave.

Statistics How to, 2014. "Cronbach's Alpha: Simple Definition, Use and Interpretation", http://www.statisticshowto.com/cronbachs-alpha-spss/, accessed on 20th April 2017.

Suanthong, S., 2008, "Reliability for Multiple Choice Examinations", in Measurement research associates, https://www.rasch.org/mra/mra-12-08.htm, accessed on 15th April 2017.

Turňa, Ľ., 2012. "Štatistická analýza výsledkov skúšok z vyučovania ProgA, ProgB".in: Inovačný proces v e-learningu: recenzovaný zborník príspevkov z medzinárodnej vedeckej konferencie: 18. 4. 2012, Bratislava: EKONÓM, pp. 1-5.

Turňa, Ľ., 2015a. "Problémy a možnosti vyjadrenia kvalitatívnej formy hodnotenia kvantitatívnym ocenením", in: Inovačný proces v e-learningu: recenzovaný zborník príspevkov z 9. medzinárodnej vedeckej konferencie: Bratislava 22. apríl 2015, EKONÓM, pp. 1-3.

Turňa, Ľ., 2015b, "O nutnosti zohľadnenia pravdepodobnosti a štatistických metód pri odhade a zisťovaní vedomostí študentov a osvojenia si študijného materiálu pomocou testov", in: Inovačný proces v e-learningu: recenzovaný zborník príspevkov [z 9.] medzinárodnej vedeckej konferencie: Bratislava 22. apríl 2015, EKONÓM, pp 4-7.

Wells, C.S., Wollack, J.A., 2003, "An Instructor's Guide to Understanding Test Reliability", https://testing.wisc.edu/Reliability.pdf, accessed on 15th April 2017.

BLENDED LEARNING AS EFFICIENT METHOD OF LANGUAGE ACQUISITION

DANA ZERZÁNOVÁ, IVANA ČECHOVÁ, JANA BERÁNKOVÁ

Language Centre
University of Defence, Brno, Czech Republic

e-mail of corresponding author: jana.berankova@unob.cz

Key words: blended learning, language acquisition, face-to-face teaching, electronic study supports, questionnaire survey

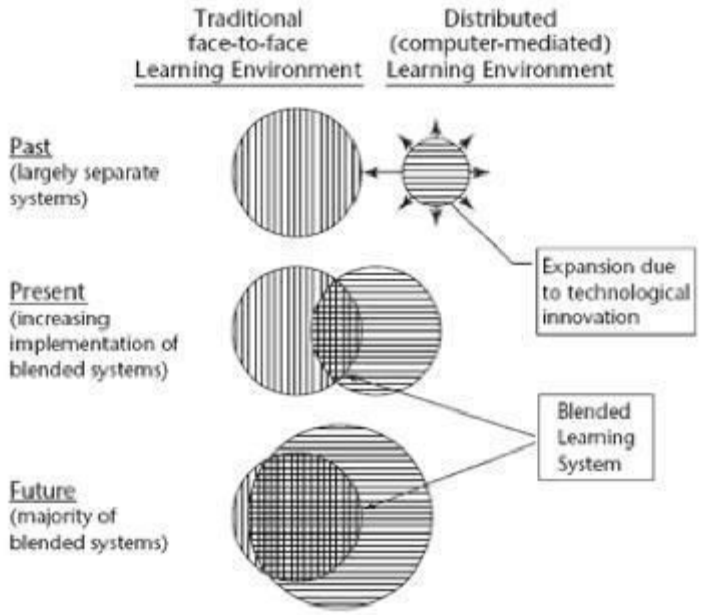
Abstract: Economic and social changes within the European Union provide new opportunities and challenges. Nowadays young people need to gain a wider scope of skills including language knowledge and intercultural abilities to succeed in the globalized economies and increasingly diversified societies. The acquisition of the necessary knowledge and skills is more effective in the school environment where the innovative approach and creativity are supported. The paper focuses on the authors´ experience of the use of ICT as the support of Brno University of Defence students´ self-study to achieve the required language level. It could seem easy for the students to pass the exam corresponding to B1 level according to the Common European Framework of Reference in four language skills, but the contrary is true. In relation to the student´s entrance language level and the relatively small amount of lessons, it was necessary to search for the appropriate way how to motivate students and provide them with study materials which regarding to their content and structure can efficiently contribute to this task´s accomplishment. The authors decided to use the blended learning method, i.e. the combination of the face-to-face teaching with the electronic study supports. The course designers concentrated primarily on creating materials aimed at practising receptive skills - reading and listening comprehension - which are the prerequisite for passing the language exam. In addition, the activities were supplemented with the set of tests and links to suitable sources for improving the remaining two productive skills. The paper describes the research oriented at getting the feedback from the course users, their incentives and comments as well. The research method was the questionnaire survey in which 135 course participants took part. The participants responded to the study supports, the electronic environment, and the course design mostly positively. However, there occurred several critical remarks as well. The results of the research will be implemented not only into lessons, but they will become the essential component of the further research in this area.

Introduction: Blended Learning

Blended learning implementation in tertiary education has dramatically increased over the last decade. Blended learning is a part of an ongoing convergence of two archetypal learning environments (Graham, 2006). On the one hand, there is the traditional face-to-face environment, on the other hand, there is distance environment supported by digital technologies. Kahn and Linquist claim: "Blended learning is a fairly new term but the concept has existed for decades in distance education" (Kahn and Linguist 2002). According to Graham, in the past, traditional face-to face learning typically occurred in a teacher-directed environment with person-to-person interaction in a live synchronous, high-fidelity environment. Distance learning (blended learning) systems emphasized self-paced learning and learning materials interactions that typically occurred in an asynchronous, low-fidelity (text only) environment (Graham, Bonk 2006, 5).

Future implementation of distance/blended systems means a balanced combination of face-to-face and distance environments, synchronous and asynchronous learning (Figure1).

PICTURE 1. PROGRESSIVE CONVERGENCE OF TRADITIONAL AND DISTANCE ENVIRONMENTS ALLOWING DEVELOPMENT OF BLENDED SYSTEMS



Source: Graham, Bonk 2006

According to Education Elements (2013), which develops blended learning technologies, successful blended learning occurs when technology and teaching inform each other: material becomes dynamic when it reaches students of varying learning styles. In other words, blended classrooms can reach and engage students in a truly customizable way. Optimally, blended learning combines online delivery of educational content with the best features of classroom interaction and live instruction to personalize learning, allow thoughtful reflection, and differentiate instruction from student to student across a diverse group of learners (Cechova and Rees 2013). Today there is no doubt as to whether or not technology should be employed in the educational process. Former UK Prime Minister Tony Blair, in introducing the National Grid for Learning, said, "Children cannot be effective in tomorrow´s world if they are trained in yesterday´s skills" (DfEE, 1997). If modern educators want to bring up and educate the new, young generation, and if they want them to succeed in the labour market, they must use technology to attract, motivate and involve students, and they must use interactive technologies to transform and improve the learning process (Cechova and Rees 2013, 2).

Garrison and Vaughan write that: "the key assumptions of a blended learning design are:

- Thoughtfully integrating face-to face and online learning;
- Fundamentally rethinking the course design to optimize student engagement;
- Restructuring and replacing traditional class contact hours" (Garrison and Vaughan 2008, 5).

According to Banados blended learning strategies consist of the following elements: face-to-face English, learners´ independent work, online monitoring, and conversation classes with a native speaker. (Banados 2006).

Blended Strategies in English Language Teaching

The term blended learning originated in the business world in connection with corporate training (Sharma and Barrett 2007), was then employed in higher education (MacDonald 2006) and then also immediately appeared in language teaching and learning.

Blended learning could be effective for achieving second language development if course developers follow basic pedagogical principles of learning and teaching and implement technologies wisely. The blended learning language course´s strength is developing receptive skills (listening and reading comprehension); its weakness appeared to be in writing and speaking.

However, constant development of technologies enables a remarkable improvement in speaking and writing skills, in addition to important improvements in all the skills, especially in listening, pronunciation, vocabulary, and grammar. Charbonneau-Gowdy writes about web-conferencing technologies to enhance speaking skills (Cechova, Charbonneau-Gowdy 2008, 34), Sluneckova suggests using technologies like Wiki to persuade students to write and share their writing (Sluneckova 2011, 6; Cechova and Rees 2013, 4). Cerna writes about social software implementation in the teaching and learning process and emphasizes its contribution in all language skills (Cerna, 2014).

A number of studies investigate learners´ attitudes towards blended learning. Leakey and Ranchoux found that "the students in large measure found the blended CALL experience a positive and motivating one and tended towards preferring [this approach] to the traditional classroom based learning" (Leakey and Ranchoux 2006, 367).

Banados´s strategies were implemented in a course of English for academic staff at the University of Defense (UoD) as the course developers wanted to distribute proportionally face-to-face lessons and self-study to balance the self-study with the amount of time spent in the classroom. The English course was divided in the following way:

- face to face lessons 40%;
- conversation with a native speaker 10%;
- learners independent work 40%;
- e-testing 10% (Cechova et al 2015, 4).

When the UoD language teachers were tasked to tailor an e-learning course to provide UoD students as well as the professionals of the Army of the Czech Republic (ACR) with a chance to practice receptive

skills and to pass their mandatory military exams (STANG 6001) they implemented all above mentioned experience to meet the ACR and UoD requirements.

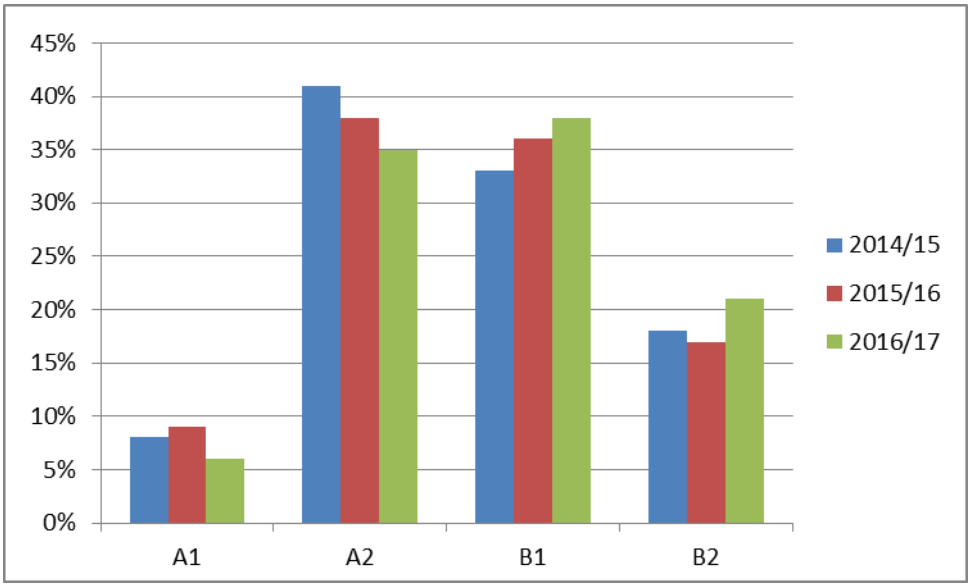
Designing the Course

The University of Defence is a tertiary education institution which educates and trains future military professionals the ACR. As the Czech Republic is the member country of the NATO, it is essential for the graduates to be educated not only in their specializations, but also to acquire the appropriate language skills, since English has become the NATO operational language. Within NATO armies the language proficiency of soldiers is compared by the NATO STANAG 6001 exam in levels SLP1 – 4 (SLP stands for Standardized Language Profile) which corresponds to the levels A1 – C2 according to the CEFR (Common European Framework of Reference). This test is not of an "achievement" type, which means that it is not based on the accomplishment of the certain amount of studied materials, grammar, and vocabulary. On the contrary, as the proficiency test, it requires a general ability to use language fluently and independently in basic everyday situations, to prove their proper knowledge and communicative skills.

The Ministry of Defence language level requirements reflect on the university study. Since the academic year 2014/15, future military professional have been educated according to the new full-time five-year Master´s degree study programme which prescribes for all undergraduates the obligation to pass NATO STANAG 6001 exam SLP2 in English in all four language skills (listening, speaking, reading, and writing), corresponding to B1 level according to the CEFR, within first five terms. If students fail the exam in one or two skills, they can resit this part of the exam within three months. If they fail more skills, they then have to sit the whole exam again. It would seem that UoD students have good prospects for passing the prescribed SLP level thanks to their previous years of English studies, but the contrary is actually true. The entry level of students is greatly varied. The usage of information technologies and blended learning strategies is one of the possibilities of how to fulfil the Ministry of Defence language level requirements.

At the beginning of the first term students undergo an entry test, the aim of which is to determine their level of English and divide them into appropriate study groups for English lessons. Within the three academic years we have registered a rising level of entry knowledge, which is positive. Nevertheless, this fact is not always the guarantee of successful fulfilment of this exam in all four skills.

GRAPH 1. ENTRY STUDENTS´ENGLISH LEVELS (CEFR)



Source: Own

UoD students attend one 90-minute lesson once a week within five terms, which makes 149 teaching units (45-minute ones) including an intensive language course at the end of the fourth term. However, this total amount of lessons does not correspond to 450 lessons prescribed by CEFR for the transition from A2 to B1 levels for all students. Achieving the proficiency level B1 causes problems for more than half of the accepted students. Students with a higher entry level than B1 can sit the NATO STANAG 6001 SLP3 exam.

The face-to-face teaching enables students to level their knowledge, therefore it is based on general English commercial textbooks available in our book market. Teachers focus on those skills with which students have difficulties while mastering, and these are mainly productive skills (speaking and writing) according to the STANAG 6001 SLP2 requirements. During their self-study students should acquire and practise the receptive skills, and so each teacher provides students with proper study materials, both in paper form and in the form of electronic links to available websites. Furthermore, students can use study materials on the UoD Intranet, like the course "STANAG SLP2 Practice", where numerous texts from commercial sources are published.

Electronic Course APA

With respect to quite a large number of students who did not achieve B1 level at the entry test, in 2015/16 teachers of the Language Centre of the UoD decided to design a compact electronic course which would help students pass the exam in two receptive skills (reading and listening) and enable them to continue with the practice for two remaining productive skills (speaking and writing). The course, which was launched in September 2016, contains authentic materials processed by the teachers and is supplied with practical exercises.

The course authors are experienced in designing online courses for combined study programme students, where the situation is even more complicated. These students have minimum face-to-face lessons and most of their study for exams is based on their self-study. Thus, the use of electronic supports can help them to orientate in the topics of individual study modules which they have to master in order to pass the final university exam. Therefore, these materials are focused on specific terminology, not on general English.

The course called APA (an acronym meaning English for the Military) is published in LMS MOODLE, which was chosen as the suitable e-learning environment because it is most widely used at Czech secondary schools and universities, and it offered us an extensive choice of interactive exercises which form the core of the e-learning course. Another advantage is that Moodle is currently used at UoD as well as at Military Secondary School and College, so all military students are already familiar with it. Apart from the interactive exercises, there are presented non-interactive study materials and additional sources.

Study materials are sorted according to topics the mastering of which is required for passing STANAG 6001 SLP2. The topics are as follows:

1. Family and Relationships
2. Job and Career
3. Housing and Accommodation
4. Travelling
5. Shopping and Services
6. Leisure Time
7. Environment
8. Health
9. Food
10. Society
11. Media
12. Basic Military English.

Each topic is divided into two lessons regarding the difficulty and contains interactive exercises for practising vocabulary and reading comprehension at levels B1 to B2 in order to offer the better students the study material as well. The exercises are incorporated in the format of QUIZ which enables the users to get feedback, their evaluation, and record-keeping. Essentially, we used the following types of interactive activities – multiple choice, close, true/false, drag and drop, and short answers boxes. When students finish the quiz, they submit it and their results in percentages are displayed. They have a chance to overlook their solutions and to compare it with the correct ones. The number of attempts is not limited and the best quiz scores are recorded. The also course includes some non-interactive exercises, where the course participants can react to the set tasks (answering questions, expressing their opinion, forming questions and comments

to the texts) which are discussed in the face-to-face lessons. Each topic includes two further lessons with tests to practice listening and reading comprehension. These tests correspond in their form to the tests at STANAG 6001 SLP2 exam, which can contribute to students´ better prospects for passing. The time allocated for each lesson is approximately 45 minutes.

The structure of every topic is as follows:

- Lesson 1: Texts and activities to the topic.
- Lesson 2: Listening comprehension test.
- Lesson 3: Texts and activities to the topic.
- Lesson 4: Reading and listening comprehension test.

The course is supplemented with the manual/instructions to facilitate the study for students. Further, the course contains Forum, where students can discuss the topics, express their opinions and inquires, and also react to the other students´ opinions. In the appendix there are additional materials including the grammar and vocabulary related to the topics.

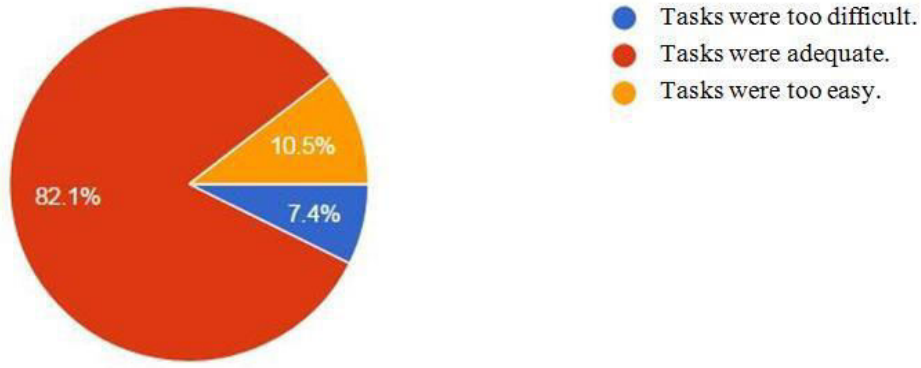
Students were offered this course as an optional source of practical activities for STANAG 6001 SLP2 exam and the frequency and length of their study depended on their responsible approach to their self-study. Also the choice of individual topics was up to them and the suggested pace was to submit one topic a month. The course was given as an obligatory part of the English self-study for those students whose entry knowledge was at levels A2 or lower.

Feedback

Students of the first and second grades of the full-time five-year Master´s degree study programme were asked to express their opinions on the course APA with focus on the level of presented materials, the time spent on individual lessons, and the format of exercises. The students were provided with an electronic questionnaire which contained 12 items. The information was gathered from 69% of respondents.

The appropriateness of materials was compared to the entry language levels of our students according to STANAG 6001 levels. We found out that this course seems suitable for more than 82% of students as a tool for their language skills improvement to meet the SLP2 requirements. They appreciate the fact that the tasks are challenging, but not excessively demanding or incomprehensible (Graph 2).

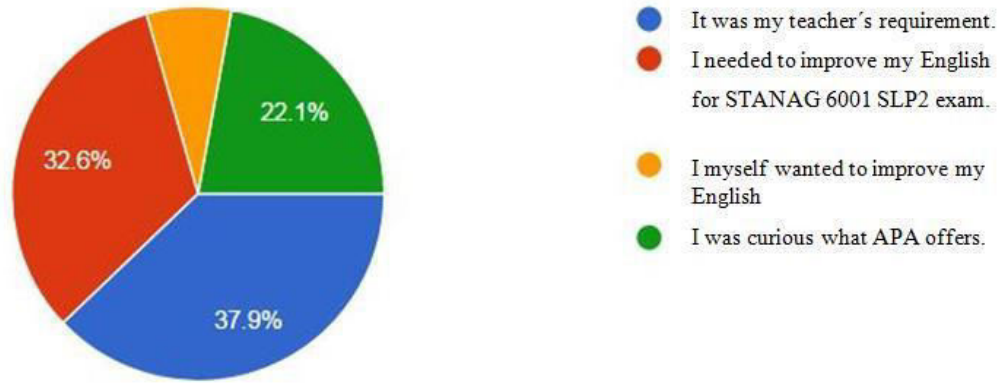
GRAPH 2. DIFFICULTY OF TASKS



Source: Own

Next we surveyed the students´ motivation for the APA course usage (Graph 3). Approximately the same number of students worked in the course on their teachers´ requirements and according to their own need to improve their skills before the exam. We were pleased that there were students who had already passed STANAG 6001 SLP2 exam who welcomed the course for revision and practice in order not to lose gained language skills (7.5%). Quite a large number of students approached the course only out of curiosity (22.6%).

GRAPH 3. REASONS FOR USING APA COURSE



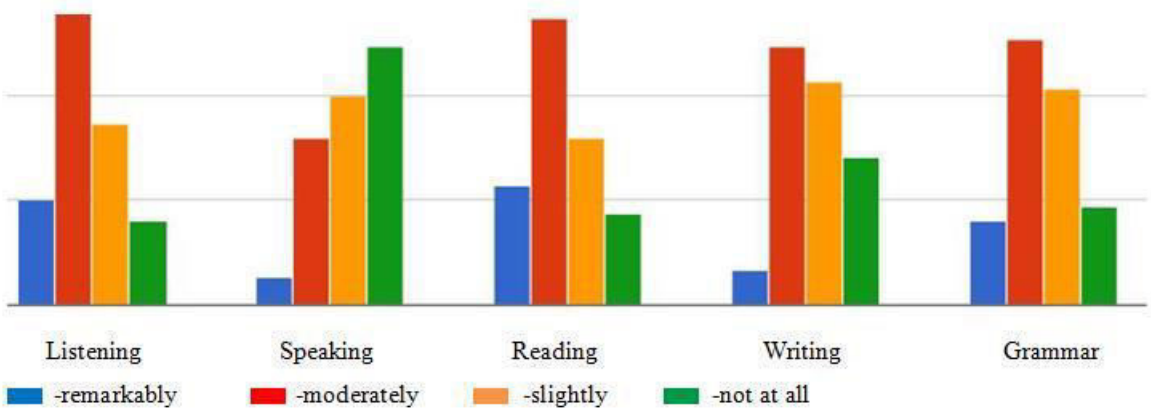
Source: Own

The students who approached the course out of curiosity stated that they did not use the APA course for the following reasons: they preferred other sources like reading authentic materials, watching films in original language with subtitles etc. (56.8%), their teacher did not require using the course (20.7%), the form of e-learning did not suit them (20.7%). Some of the respondents state that they did not use the APA course because they were too busy (24.2%). (See Table 1)

TABLE 1. REASONS FOR LOW NUMBER OF VISITS TO APA COURSE	
If you studied at the course only several times (1x to 4x), mark the three most likely reasons for this fact.	
1. I use other possibilities for studying English.	56.8%
2. I forgot about the APA course.	31.6%
3. I am too busy to study the APA course.	24.2%
4. My teacher does not make me study the APA course.	20.7%
5. E-learning does not suit me.	20.7%
6. The technical environment of Moodle puts me off.	13.7%
7. I do not have an Internet access.	5.3%
SOURCE: OWN. DATA FROM APA QUESTIONNAIRE.	

The students of the full-time five-year Master´s degree study programme do not have any problems in working with electronic study materials (83% did not state any problems), which is contrary to the previous authors´ experience with e-learning courses designed for the combined study programme students where only 55% of respondents were satisfied with electronic environment (Berankova et al 2013, 13). The contemporary full-time students accept the blended-learning form positively. According to the questionnaire, the APA course helped to improve listening comprehension for 60%, reading comprehension for 62%, and grammar for 53% of them (Graph 4). Although the course is not primarily focused on speaking and writing skills, students noticed their improvement in speaking (30%) and writing (44%).

GRAPH 4. SKILLS IMPROVEMENT



Source: Own

There were also several students´ critical remarks. For example, they did not regard LMS MOODLE as the suitable online environment, and they suggested different, more advanced possibilities. However, we cannot take these suggestions into account because of the previously stated reasons for the choice. Some of the students criticized mistakes in several tasks which complicated their self-study. If these mistakes were reported, the authors were grateful for the students´ cooperation and corrected them as quickly as possible. Students could report the comments to their teachers or comment in the Forum which is at the top of the course. The next remark dealt with the way the correctness of the exercises was displayed. Students had to

go through the whole lesson, submit their answers, and only then they could go through the lesson again and see the correct answers. We reacted by the change of the exercises setting – students can see the correct answers immediately after submitting individual exercises.

Despite the fact that there appeared to be several critical remarks, overall the APA course was accepted positively. We can state that the course met the purpose it was designed for – to help students with improving and practising the receptive skills, reading and listening comprehension, to be able to pass the Ministry of Defence requirement for STANAG 6001 SLP2 exam.

Conclusion

The path from traditional to blended learning is not without its challenges and pitfalls. The aim of this paper and research was to share the challenges faced in blended programme at the University of Defence. Our focus was primarily on engagement and investment in sustained use of the APA course provided as the part of current English language courses. The research method, questionnaire, enabled us to address the APA users, to gather and process data from all respondents, albeit this part of research will be followed by the qualitative research (semi-structured interviews) to get information in depth.

From the gathered data it was concluded that the appropriateness of materials is adequate for the majority of students (82.1%), which is positive. On the other hand, all critical remarks and recommendations have been implemented in the APA course and serve as a source of inspiration for the further work. Ayan states that implementation of Moodle is both motivating and autonomy building particularly in English language courses (Ayan 2015, 6), however, only 32.6 % of the UoD students used the APA course because they needed to improve their English for STANAG 60001 SLP2 exam, which is the mandatory exam for all military professionals. Some students did not regard LMS Moodle as a suitable online environment. According to the search for a suitable virtual learning environment for the Czech military, the DISTANCE Defence Research Project in 2007-2008 (Halberstat, Prenosil 2009), in which one of the co-authors participated, three independent studies suggested Moodle as the most suitable LMS for the ACR. Additionally, Stankova and Businova state that Moodle modules enable the educators to build richly collaborative communities, to deliver the content to students, and assess students´ performance (Stankova, Businova 2010, 147).

The authors consider the research as the beginning of a longer process to optimize language training at the UoD and to enhance the UoD students´ successfulness in meeting the ACR requirements.

References

Ayan, E. 2015. “Moodle as Builder of Motivation and Autonomy in English Courses. “ Open Journal of Modern Linguistics, 2015, 5, pp. 6-20. Published Online February 2015 in SciRes. http://dx.doi.org/10.4236/ojml.2015.51002, accessed on 15th April 2017.

Banados, E. 2006. “A Blended-learning Pedagogical Model for Teaching and Learning EFL Successfully Through a Networked Interactive Multimedia Environment. “ CALICO Journal, 23 (3), pp. 533-550.

Berankova, J.; Cechova, I; Zerzanova, D. 2013. “Appropriate tool to get appropriate knowledge: How does it work? “, in: Distance Learning, Simulation and Communication 2013**.** Brno: Univerzita obrany, pp. 13-19.

Cechova, I., Carbonneau--Gowdy, P. 2008. “Partnership for Learning Pilot Project: A New Approach to Language Learning in a Computer- Mediated Communication Context“., in: Proceedings, Volume II, The second International Multi-Conference on Society,Cybernetics and Informatics. Orlando, Florida, USA.

Cechova, I., Dvorak, J., Berankova, J., Zerzanova, D., 2015. “Professional Development of Academic Workers: Creating New Open Course to Enhance English Language Competence of Academic Workers.“, in: 14th European Conference on e-Learning. UK: University of Hertfordshire Hatfield, UK, pp. 107-113.

Cechova, I., Rees, M., 2013. “Blended learning as a means to enhance students´ motivation and to improve self-governed learning.“, in: Proceedings of the 12th European Conference on e-Learning. Sophia Antipolis, France: SKEMA Business School, pp. 71-77.

Cerna, M., 2014. “Trends in Acceptance of Social Software Applications in Higher Education from the Perspective of University Students - Case Study“, in: Proceedings of the 13the European Conference on e-Learning. Copenhagen,

Graham, Ch. R., Bonk, C. J., 2006. The Handbook of Blended Learning: Global Perspectives, Local Designs. Pfeiffer, San Francisco.

Garrison, D. R., Vaughan, N. D., 2008. Blended Learning in Higher Education: Framework, Principles, and Guidelines. Jossey-Bass. A Wiley Imprint.

Halberstat, L., Prenosil, V. et al. 2009. DISTANCE Defence Research Project - Final Report. Prague: MoD.

Khan, A. & Lindquist, K., 2002. Blended Learning at a Leading Education Institute: State of Practice, elearn.

Leakey, J and Ranchoux, A. 2006. BLINGUA. A blended language learning approach for CALL. Computer Assisted Language Learning 19 (4), pp. 357–372.

The Definition Of Blended Learning .2013. http://www.teachthought.com/learning/blended-flipped-learning/the-definition-of-blended-learning/, accessed on 2nd May 2017.

Osguthorpe, R. T. & Graham, C. R., 2003. “Blended Learning Systems: Definitions and Directions“. Quarterly Review of Distance Learning 4/3, pp. 227-234.

Sluneckova, L., 2011. “Practical suggestions for effective implementation of e-learning as a means to increase student engagement in their own learning”, Paper read at International Conference on Distance Learning, Simulation and Communication, Brno, Czech Republic, May.

Stankova, E., Businova H. 2010. “ Implementation of the Moodle Course Management System in English Language Training at the University of Defence. Advances“ , Military Technology 5 (2).

THE USE OF VIDEO RECORDINGS OF MICROTEACHING IN CZECH LANGUAGE DIDACTICS LESSONS

JANA VEJVODOVÁ

Faculty of Education
University of West Bohemia, Czech Republic

e-mail of corresponding author:vejvod@kcj.zcu.cz

Key words: microteaching, video-mediated microteaching, teacher education**,** pedagogical content knowledge, didactics of Czech as a mother tongue

Abstract: Didactics of Czech as a mother tongue is a hands-on discipline with a direct relationship to actual practice as it explores real-life issues of language teaching and provides trainee teachers with inspiration and input relating to not only organization and planning of teaching sessions but also to methods, organizational forms and other aspects of the teaching process. Although it incorporates trainee teachers' classroom observation and teaching practice at partnership schools, the range of opportunities for practising teaching remains limited – from the viewpoints of both trainee teachers and didactics specialists. Video recordings of microteaching sessions in seminars on didactics of Czech as a mother tongue thus play an important role in the self-reflection of trainee teachers. This paper presents the author's experience with the use of such recordings in seminars. It highlights the importance of an appropriate choice of the teaching situation, and proper preparation of trainee teachers for their microteaching sessions. The microeducation analysis reveals the merits and drawbacks of trainee teachers' microteaching sessions from the perspective of pedagogical content knowledge, and directs their attention to their strengths and weaknesses in both verbal and non-verbal communication. By examining the video recordings, trainee teachers can identify – more readily than in didactics textbooks – any instances where the didactic principle of linguistic approach has been breached. The author believes that involvement of trainee teachers is very important, both in assessing the quality of the microteaching sessions of their colleagues and in proposing and substantiating alterations to the teaching situation. Based on a review of questionnaires completed by the trainee teachers at the end of their semester, the author outlines strong and weak points of the use of video recordings in seminars.

Introduction

Didactics of Czech as a mother tongue is a hands-on discipline with a direct relationship to actual practice as it explores real-life issues of didactic transformation of linguistic knowledge and provides trainee teachers with inspiration and input relating to not only organization and planning of teaching sessions but also methods, organizational forms and other aspects of the teaching process. On the curriculum offered by the Faculty of Education of the University of West Bohemia in Plzeň, it is not an isolated item because it is closely linked to other courses: Modern Methods of Czech Language Teaching, and Information and Communication Technologies in the Czech Language Subject. In all these courses, trainee teachers are guided to use reflection and self-reflection, focusing mainly on the effectiveness of particular teaching methods when applied to specific language features that the class is expected to master.

Our aim is to train the future teachers of Czech language to develop particular knowledge and skills which are unavailable to those untrained in teaching and those outside the teaching profession. In our understanding, this particular knowledge comprises the pedagogical content knowledge. It is a category which represents the greatest difference between a teacher and a specialist, in terms of their view of the content of their disciplines (Janík 2009).

Pedagogical content knowledge stems from four sources: a) observation of instruction as a student or teacher, b) training in professional disciplines, c) training in specific disciplines during teacher training and d) own teaching experience (Grossman 1990).

In seminars on didactics of Czech language, we aim to develop trainee teachers' pedagogical content knowledge and teach them how to transform their content knowledge to match the students' level of understanding.

These seminars are closely linked to the trainees' final teaching practice – but trainee teachers still see the number of opportunities for self-reflection on their own teaching practice as inadequate. For these reasons, we have introduced microteaching into these seminars. Analyses of microlessons enable trainee teachers to cultivate their ability to review their own performance and demonstrate their approach. Microteaching also facilitates their collaboration. We see this as a significant element, as the "collective" aspect of the teaching profession has been gaining importance, with its emphasis on effective communication.

Microteaching in didactics of Czech language strengthens the constructivist character of this discipline. Trainee teachers approach the topics from multiple perspectives: using primary sources, electronic materials from the on-line course, video recordings of lessons delivered by experienced teachers, examples of teaching materials and materials for analysis, their own activities in the seminars, discussions with the supervisor, consultations, microlessons of their colleagues and their own, and their experience from the final teaching practice.

In the present paper, we analysed end-semester questionnaires completed by trainee teachers in the course of didactics of Czech as a mother tongue who were training to become secondary school teachers. Since the number of questionnaires returned was 26, the quantitative findings are not statistically significant. Nevertheless, the trainee teachers' responses to open questions help shed light on the strengths and weaknesses, and on the risks and opportunities for improvement. The questionnaire was designed to explore the effectiveness of constructivist features in didactics when microteaching and analysis of video recordings of microlessons are used. This paper highlights specific aspects of the constructivist instruction (Murphy 1997) in bold print.

Functions of microteaching

The first mentions of microteaching in Czech publications date back to the 1970s (Mareš 1976), and then re-emerge in the second half of the 1990s (Spilková 1995; Svatoš 1997). The authors of microteaching have defined it as controlled practice which enables focusing on specific elements of teaching and practising those under controlled conditions (Allen & Eve 1968). Microteaching comprises the planning, delivery of and reflection on a reduced-scale instruction session for a group of fellow trainee teachers. The length of such a microlesson and the number of students in the microclass may vary. The microlesson often takes between 10 and 20 minutes, involving 10 to 30 students (Bakir 2014). In our seminar, the trainee teachers were invited to prepare microlessons of 15–20 minutes. In reality, the shortest one took 15 minutes and 51 seconds, whereas the longest one was 28 minutes and 20 seconds. In one instance, the trainee teachers failed to adhere to the agreed scope, delivering a

microlesson which comprised the entire lesson: 43 minutes and 43 seconds. This proved highly undesirable with respect to the intended objectives.

The key elements of microteaching include translation of theory into practice in the form of the trainee teachers' own teaching activity, giving and receiving feedback, and self-reflection. The supervisor's role is to provide a safe and supporting environment to help the trainee teachers learn from one another (Fernández & Robinson 2006).

Self-reflection involves subjective generalization of knowledge about oneself, upon considering one's own activity and personality in relation to conducting the teaching process" (Kolář 2012). The trainee teacher gets an opportunity for self-evaluation in relation to his or her performance in a teaching situation, and can make decisions on what to change. In addition, the trainee teacher receives feedback from his or her colleagues and the supervisor. The key part of self-reflection is deriving conclusions and making decisions on teaching strategies.

Self-reflection upon microlessons fulfils cognitive, feedback, development, preventive and relaxation roles. The cognitive role means that the trainee teacher becomes aware of problems and their potential solutions, his or her own response to particular teaching situations, and feelings towards him or herself, as well as towards the students. The microlessons fulfil the feedback role in that the trainee teacher becomes aware of his or her teaching interventions and the students' reactions. Development of the trainee teacher's teaching skills is another outcome of microteaching. The aspect of prevention is entailed in the trainee teachers' learning from their own experience. Relaxation results from positive feedback given to the trainee teacher who thus gains satisfaction and enjoys the experience.

Organization of microlessons

In the introductory seminar, the functions of microteaching, the organization and evaluation criteria were presented to the trainee teachers. One of the important aspects of constructivist teaching is collaborative and cooperative learning which exposes trainee teachers to different opinions and perspectives (alternative viewpoints). In view of this, we opted for trainee teachers working in pairs because the recent teaching practice also involves teaching in tandem. Knowledge construction is based on the trainee teacher's individual experience and takes place during discussions in pairs (knowledge collaboration). Trainee teachers' answers to the question whether they were comfortable with conducting microlessons in pairs were 84.62% 'yes' and 15.38 'generally yes'. In their explanations, the trainee teachers confirmed that this reduced their anxiety and uneasiness which could arise from the fact of being videotaped, as well as from the anticipated evaluation. *"During the microlesson, I was less nervous than if I were on my own."* As the number of trainee teachers in the class was odd, one of the groups comprised three trainee teachers. In their view, this was not an optimal arrangement. *"Our group had three members and our collaboration went well but I would certainly prefer working in a group no larger than two."* The reason they gave was that reaching consensus on a topic and a certain

didactic solution was more difficult and lengthy in a group of three. *"Each of us defended her own proposal."*

The trainee teachers gave the same answers to the question whether their collaboration in pairs (groups) while preparing the microlesson had been effective (84.62% 'yes', 15.38% 'generally yes'). *"Each of us contributed with their own ideas; the microlesson was therefore prepared sooner and, more importantly, it was of better quality than if I had done it on my own." "We were able to consult things, recommend publications etc.; as they say: two heads are better than one."*

This also proved the effectiveness of letting trainee teachers choose their partners. Experience of earlier collaboration was a great advantage. *"Having Jakub as my partner made the assignment an absolute dream. We had been classmates in drama education where we had learned to cooperate; and now we benefited greatly from that. Specifically, it helped us come up with the activities for our microlesson. I mean all activities."*

The seminars comprise thematic units covering the language component of the Czech language subject. Each pair of trainee teachers chose one thematic unit and one topic from this unit for their microlesson (subjects relating to word meanings, word formation and structure, syntax, morphology, orthography, and general instruction on language).

In the literature on microteaching, we tend to encounter an approach where the trainee teachers in introductory seminars draw lots for the method and the lesson stage (motivation, exposure and fixation) to be used in their microlessons (Bajtoš, Orosová 2011). It is beneficial in the breadth of methods which the trainee teachers encounter during the seminar. In our opinion, it is suitable for seminars on pedagogy or general didactics. Because our seminar on didactics of Czech as a mother tongue focuses on didactic transformation of linguistic knowledge, trainee teachers do not draw lots when choosing methods. After the trainee teachers selected their thematic units, there would be a risk that the method chosen by lots be forcefully applied to a topic for which it is unsuitable or ineffective. We believe that the method must be chosen with respect to its function. Where identical methods were chosen over and over in the microlessons, we pointed out alternatives during the follow-up analysis.

76.92% of trainee teachers answered 'yes' and 23.08% of trainee teachers answered 'generally yes' to the following question: "Were you satisfied with having the choice of the teaching situation for your microlesson within the assigned thematic unit?"

"Everyone was able to choose the topic they found suitable. As for myself, I work best on what I enjoy." "We practised exactly what we wanted to."

"We had the option of choosing a teaching method first, and then identifying a language feature within the thematic unit for which it was suitable."

The answers were an indication of student-directed goals. The trainee teachers decided what to focus on and what they wanted to learn or practise during their microlesson.

They were informed about the date of their microlesson and about the classroom equipment. Available to them was the SMART Board interactive whiteboard and the SMART Notebook application which they had learned to use in the ICT discipline for the Czech language subject in the previous semester.

The position of the camera which captured the microlessons was given by the available space. The classroom where the seminars on didactics of Czech as a mother tongue took place had the advantage of desks being arranged parallel to the longer wall. The camera was positioned between the wall with the whiteboard and the side wall. If we had a wider lens and the trainee teachers' chairs had been arranged appropriately, no operator would be required and a static camera could have been used. The optimal configuration might seem to involve two cameras for capturing the microlessons: the classroom camera pointed at the trainee teachers in the role of students and the teacher camera recording the trainee teachers in the role of teachers (Janík, Miková 2006). It would, however, place demands on equipment, subsequent processing of the recording, and the staff. Even more importantly, it could put stress on the microteachers. Recording the microlessons without lapel microphones for trainee teachers and without surround microphones or a directional microphone proved useful. The reason was that one of the aspects of our microlesson analysis involves the use of voice. The recordings revealed differences in speech intelligibility, and provided feedback for further development of vocal skills.

The video recordings were done in a single take. Therefore, they also captured those parts of microlessons in which the trainee teachers in the role of students worked on their own and the microteachers walked among them and corrected or helped them with their activities.

Links to the recordings were available to the trainee teachers within three days via the Moodle LMS. They could access them in the course on didactics of Czech as a mother tongue which they could also use for preparing their microlessons.

It offered seven chapters which identified critical issues in individual thematic units of the Czech language subject, explaining why these were difficult for students, and presenting examples, demonstrations, analogies and flash animations which were most effective for clarification. The course also provided links to video recordings of Czech language lessons made under the Virtual Classroom Observation project. By combining the materials in on-line courses, field observations and final teaching practice, didactic theory and practice can be brought together.

Trainee teachers' answers in the questionnaires showed that they were aware of the importance of video recording to their self-reflection and feedback but they also indicated it as the single most stressing factor.

The responses to the question whether making video recordings of the microlessons was meaningful involved 57.69% of 'yes' answers, 34.62% of 'generally yes' answers, 3.85% of 'not really' answers and 7.69% of 'no' answers.

Those who answered 'yes' gave the following reasons: *"It is the most effective feedback one can get. It even shows things that one can easily overlook during the lesson."* "*Although I do not like watching video recordings of myself, I consider them very effective – for the simple reason that they enable us see ourselves through the eyes of others, the learners, and show us the mistakes we do not notice while teaching." "Mainly for self-reflection. When speaking, one is not aware of so many things – and the video can provide a perfect feedback."* Those who answered 'generally yes', gave the following reasons: *"One can notice mistakes that one was not aware of. It just seems to me that the camera made some people nervous and their teaching performance was then different from the performance that they would deliver without being video-recorded."*

The trainee teacher who answered 'not really' argued that the stress was excessive. *"Trainee teachers with a panic fear from speaking in front of a camera might collapse."* Even she, however, admitted the benefits of video recording in her response to an open question: *"On the other hand, without the video, we would hardly become aware of our weak points."*

The only trainee teacher who gave the answer 'no' had the following explanation: *"In my opinion, the video recordings as a tool for self-reflection would be more effective and, in particular, more objective if made during actual teaching practice. Microlessons could do with a follow-up feedback without the use of video."* However, this suggestion is very difficult to implement because obtaining consent to recording the instruction in primary and secondary schools on video is virtually impossible.

Although these teaching situations are not real-life situations, they still provide trainee teachers with opportunities for exploration, which is the most effective way to acquire knowledge independently.

Microteaching analysis

Microteaching analysis did not take place immediately after the microlesson. If it did, it would be somewhat intuitive and superficial, without reflecting the teaching situation in depth. By contrast, we placed stress on problem solving, higher-order thinking and profound understanding of the subject.

Trainee teachers and the didactics supervisor had the time until the next seminar to assess the microlesson from various angles, conduct an in-depth analysis and suggest improvement with respect to the topic, if needed. An analysis of the video-recorded microlesson provides facts instead of mere impressions, opinions or reflections of attitudes. It enables the trainee teachers to contrast their view of themselves with their actual teaching performance. Trainee teachers take into account their pre-existing knowledge, conceptions and views (previous knowledge constructions).

This leads to a thorough reflection on the learning process and the trainee teachers' self-regulation (metacognition).

Trainee teachers thus become the main agents of the appropriate delivery of didactics of Czech as a mother tongue (learner control).

The supervisor acts as a guide, coach, tutor and facilitator (teacher as a coach). Trainee teachers are guided to active knowledge construction, instead of mere reproduction. The supervisor continuously provides support and motivation to the trainee teachers to push the boundaries of their existing knowledge and skills (scaffolding).

The assessment of learning performance is not separate from the learning process. Trainee teachers are evaluated on a continuous basis (authentic assessment).

We make trainee teachers work out answers to the following questions: *"What have I been doing, how and why, with what intentions and expectations, what were my results, where were critical spots and why, and what were alternative ways of doing it?"* (Mazáčová 2008)

Mistakes are seen as opportunities for getting an insight into pre-existing knowledge of the trainee teacher. Mistakes become a material to be worked on (consideration of errors). One of the trainee teachers made a good point in her questionnaire: *"Many colleagues are worried before such lesson and are afraid of making a mistake. However, there is nothing wrong about making a mistake during one's microlesson. Where else can one afford mistakes than on such an occasion?"*

We used the following criteria for microteaching analysis:

specialist knowledge correctness criterion,

psychodidactic criterion,

communication criterion,

control/organizational criterion.

In our seminar, we tried various forms of feedback on microteaching based on the criteria.

The questionnaire included the following question:

Which form of self-reflection and feedback on a microlesson do you find most effective?

verbal self-reflection and feedback from colleagues and the supervisor, discussion

verbal self-reflection and feedback from the supervisor, written anonymous feedback from colleagues submitted on sheets of paper (and read by the supervisor),

written discussion in the Moodle LMS – microteachers' self-reflection, feedback from colleagues; the supervisor moderating the written discussion,

other

46.15% of teacher trainees chose option a), i.e. an open discussion during the seminar. One of the trainee teachers explained her choice. *"It is important to provide an environment in which participants are frank and are not afraid to give their opinion, particularly when it comes to expressing criticism of colleagues."* This answer, too, shows how important it is for the trainee teachers to be aware during the microteaching analysis that the point is not in criticizing colleagues but in seeking and finding solutions for "critical issues" with the help from the supervisor and all members of the trainee teacher group.

Many trainee teachers have difficulties to publicly express their opinion on negative aspects of a microlesson. This is why 53.85% of the trainee teachers preferred written anonymous feedback on a sheet of paper read by the supervisor.

Besides these two forms of feedback, we use written feedback on the discussion forum in the Moodle LMS. It is an opportunity to express their opinion for those trainee teachers whose curriculum has been adapted because they already worked as teachers. We consider their views very important because they can share their real-life experience with their colleagues in the seminar. In terms of negative emotions which the written feedback may trigger in microteachers, this form of feedback poses the highest risk.

Specialist knowledge correctness criterion

Our basic premise was that the best way to embed specialist knowledge involves passing it on. Therefore, the questionnaire for the trainee teachers included the following question: Did your preparation of the microlesson help you better understand the language feature you taught? 23.08% of the trainee teachers answered 'yes', 15.38% 'generally yes', 30.77% 'not really', 15.38% 'no' and 7.69% 'don't know'. Our hypothesis of a majority of positive or mostly positive answers was thus disproved. One possible reason is that the trainee teachers have chosen topics with which they were thoroughly familiar. *"We picked a language feature which we knew relatively well. Still, afterwards I understood better some details of the subject."*

The three-member group had more difficulties achieving consensus about the topic of their microlesson. Despite that, one of the members stated a positive effect of their cooperation: *"I have always had difficulties with complement clauses but our preparation helped me understand them better because my colleagues were able to explain them."* Other students used expressions similar to "understand better", such as "refresh", "embed" and "clarify". *"Thanks to the microlesson, I was able to refresh and clarify my knowledge, such as the word formation and derivation." "I strove to present the feature exactly the same as way I would to actual students in the class. I studied the subject diligently which helped me improve my knowledge." "I would not say that the microlessons directly contributed to better understanding of the subject but they helped me get a clearer picture and think through the options of the didactic approach."*

A greater number of positive answers were given to the question: "Did any of the microlessons or their follow-up analysis help you better understand the language feature in question?" These answers were: 30.77% 'yes', 38.46% 'generally yes', 23.08% 'not really' and 7.69% 'no'. One of the responses to the related open question which asked for examples to illustrate a positive answer was as follows: *"I would not pick a concrete example. All the microlessons helped me refresh the topics and offered new options for presenting them to students."* Some trainee teachers were perhaps reluctant to admit their lack of knowledge. Those who were able to do so, listed some complex syntactic features as more difficult topics. This was related to the microlesson on complement clauses. *"I probably should not admit this publicly but I was not thoroughly familiar with this subject, which is why I was excited about my colleagues' microlesson."*

One of the students reported that he had gained more understanding of a feature from the follow-up analysis and the explanation given by the supervisor than from the microlesson.

The microteaching analysis focuses on how the microteacher follows the didactic principle of linguistic approach. This principle requires accurate presentation and giving linguistically correct explanations of language features.

The principle can be breached by

inaccurate explanation of language features,

incomplete or inaccurate presentation of language features,

incorrect use of terminology,

using expressions or terms unfamiliar to the students.

All these inaccuracies were found in trainee teachers' microlessons.

Psychodidactic criterion

We examined how effective choices the trainee teacher makes in terms of methods and organizational forms and the ability he or she demonstrates in planning the motivation and activation of students. We asked the trainee teachers the following question: "Have your colleagues' microlessons and the feedback to them helped you evaluate any psychodidactic aspects? (E.g. the choice of methods, organizational forms, students' motivation and activation and others.)" 53.85% of the trainee teachers answered 'yes', 30.77% gave the answer 'generally yes', and 15.38% responded 'don't know'.

Microlessons reveal how important it is for trainee teachers to consider motivation in their teaching situations. It is typical of students aged 15–19 that they enjoy new things and are unwilling to revisit those they had learned about earlier. This tends to be behind the secondary students' lack of interest in language lessons. Reviewing a subject at the same level as before is seen by students – justifiably – as something trivial and not very useful, because they had heard about such topics in their final years at

the primary school. We used microteaching analysis to jointly seek better solutions for teaching situations which lacked motivational elements.

"Several enjoyable methods that were used by my colleagues certainly inspired me, for instance the 'game with compound words'. I also learned from some of their mistakes (lack of motivation and activation in the students)."

"Students must be continuously involved or activated! Some microlessons started with a short theoretical introduction in the form of a dialogue with students and continued with exercises – which was great. On the other hand, there were microlessons which included long theoretical presentations (either in the opening or at the end) without engaging the students – and that is bad! Students should be active agents of the instruction."

"I realized how well the class can work when students enjoy the activity."

"The video recording from 17th March made me aware of the pitfalls of group work and student motivation in various contests."

It emerged that trainee teachers can critically evaluate methods on the basis of their effective use, rather than classifying them as modern or traditional ones:

"I often hear that the lecture is an anachronism but I categorically reject such opinions. Obviously, the instruction should not consist of a teacher monologue but an explanation by the teacher is essential for students to understand new subjects and I believe that my colleagues succeeded in keeping their 'students' interested at this stage."

We also pay attention to the appropriate use of instruction methods for the goal set by the trainee teacher for the students. For instance, if the trainee teacher uses deduction as the fundamental logical reasoning process (a sequence of steps starting from a definition of a general concept), our microteaching analysis will involve comparison with inductive reasoning (starting from concrete language materials and deriving a general principle or definition) and help trainee teachers identify the advantages of the inductive process.

We asked the trainee teachers the following question: "Has follow-up feedback or self-reflection on your own microlesson helped you identify critical points and consider why and how 'it could have been done in a different way'?" 30.77% of the trainee teachers answered 'yes', 23.08% gave the answer 'generally yes', and 46.15% responded 'don't know'. We attribute this to some trainee teachers' reluctance to point out their 'weak spots' in their answer. Nevertheless, we also encountered excessive self-criticism. A student from the three-strong group wrote: *"It seems to me that our whole microlesson was critical – inaccurate theoretical knowledge, poor illustration of features, sometimes even wrong examples."* We find the opinion of another trainee teacher from this group very positive: *"Above all, I*

have realized I should not worry too much about everything. Everyone can make a mistake and we are only humans."

Communication criterion

We analyse the verbal component of communication, the vocal component (the voice tone and modulation), as well as the non-verbal component. We direct trainee teachers' attention to the most frequent mistakes in the wording of questions, their accuracy, intelligibility, linguistic correctness, and their sequence in the dialogue, following the logic of the language feature taught. As former primary and secondary school students, the trainee teachers had often encountered an authoritative and non-interactive approach (lectures with prevailing monologue) or an authoritative interactive approach (with the teacher asking mostly closed questions and with short answers from the students). In their microlessons, they should learn to ask open questions which stimulate students' thinking and invite them to express their own opinions. They should also adopt appropriate responses to the students' answers. The answers should not be evaluated exclusively on the basis of correctness. They should become the source for formulating follow-up questions. We should move from the dialogue (teacher – student) toward the polylogue where multiple speakers respond to one another. In their microlessons, the trainee teachers also practise the use of proper Czech as the natural code for teaching the Czech language. They also identify filler words in their speech.

We asked the following question: "Has the video recording of your microlesson helped you evaluate your verbal communication?" 46.15% of trainee teachers answered 'yes', 23.08% gave the answer 'generally yes', and 30.77 % responded 'don't know'.

In their use of voice, some trainee teachers relied on their experience from the courses of the Drama Education curriculum. This was an example of interrelationship between subjects (conceptual interrelatedness)**.** *"I have completed the course Speech Education. The aim was to learn to master one's breath which is a prerequisite for correct phrasing. Thanks to this course, a film is projected on the background in my head with every speech (where I picture exactly what I am saying). This process taught me not to "lose the thread" and also to speak more slowly (I need to first project, then realize and then say what I want to express)."*

Trainee teachers should also learn that non-verbal communication can be used to improve students' relationship to the teacher as well as to the subject and even make students keen to learn more about the topic. Microteaching analysis shows that the desired open atmosphere can be facilitated by voice dynamics and diversity, the pace of speech, smiling, leaning toward the student, maintaining eye contact, using gestures and relaxed posture and appropriate proxemic behaviour and movements.

Non-verbal communication was addressed in the following question: "Has the video recording of your microlesson helped you evaluate your non-verbal communication?" 19.23% of the trainee teachers answered 'yes', 11.54% gave the answer 'generally yes', 7.69% responded by 'no', and 61.54 % gave

the answer ‘don’t know’. Answers to the question about what trainee teachers noted in the analysis of their non-verbal behaviour rarely involved negative self-reflection: *“I would say that my gestures were appropriate, although I sometimes come across forced and stilted.”* Despite the high percentage of ‘don’t know’ answers to this question, the responses to the last question on the questionnaire which explored whether the trainee teachers used any of their findings from self-reflection in their final teaching practice, many respondents mentioned examples of non-verbal behaviour. *“I tend to put hands in my pockets and lean on the teacher’s desk while teaching. I am aware of these deficiencies and strive to minimize them.”*

Control/organizational criterion

We monitor how well the trainee teacher handles the organization of student activities during the lesson. Although the microteaching situations are somewhat artificial and not authentic, trainee teachers in the role of students sometimes create unusual teaching situations to which the microteacher must respond. We analyse them and the trainee teachers assess the microteacher’s handling of such situations. We take note of how the trainee teacher responds to these situations and how well he or she creates positive atmosphere, guides student group activities, how he or she works in tandem etc.

We asked the trainee teachers whether self-reflection on their microlesson helped them become aware of any issues relating to lesson organization. (Organizing the group work, working in pairs, contests, language games, creative drama, writing on the board, and others.)

30.77% of the trainee teachers answered ‘yes’, 26.92% gave the answer ‘generally yes’, 7.69% responded by ‘no’, and 34.62% gave the answer ‘don’t know’.

They listed the following examples: *“It is better to first assign a task and only after that hand out the materials. This way one avoids the noise and loss of concentration among students.”*

“Results of contests must not be announced before the task has been completed by all students.”

“During my microlesson but also in my final teaching practice I began to find that writing information on the board (when presenting a new subject) is in fact a waste of time. I believe that nowadays a PowerPoint presentation is a better choice for presenting the subject to students. The teacher can show bullet points one by one, while activating the students.”

Related to the above question is the following one: Have your colleagues’ microlessons and the feedback to them helped you become aware of any problems related to the lesson organization? 34.62% of trainee teachers answered ‘yes’, 26.92% gave the answer ‘generally yes’, 11.54% responded by ‘not really’, and 26.92% gave the answer ‘don’t know’. They mentioned the following examples: *“When students are working in small groups, it helps to walk among them to make sure they understand all that is required.” “Pair work appears more effective to me than small-group work. The more people are assigned to a task, the fewer actually work on it – or, conversely, everyone gets involved,*

supporting a solution and opinion of their own." "In one microlesson, the colleagues awarded points for correct answers – but not in every question. As a result, there were students who answered many times but received no points; and when a question with some point value came up, they gave a wrong answer and ended up without a point again. The problem was that it was not clear beforehand which question has a point value and which has none. Obviously, this motivates students to respond to all questions but in the end, this evaluation scheme is unfair."

Evaluation of microlessons in didactics of Czech as a mother tongue

Responses to the question whether the use of microteaching in didactics of Czech as a mother tongue is meaningful included 73.08% 'yes', 23.08% 'generally yes' and 3.85% 'not really' answers.

The only student who gave the answer 'not really' objected mainly to the video which she found very stressful. At the same time, however, she answered 'yes' to the question whether the video recording helped her evaluate her verbal communication; and she identified microlessons as beneficial in five other aspects.

In their questionnaires, the trainee teachers identified the strongest point of the microlessons as the perfect feedback they received from their colleagues and the supervisor after the video recordings analysis, as well as their own self-reflection. They valued the fact that they could test the didactic effectiveness of the approach they had chosen. They also praised the opportunity to try and experience the teacher role before people they knew well. They reported that this helped them get over their stage fright and gain confidence, referring to the microteaching experience as a small test before their final teaching practice.

One very satisfying finding is that most trainee teachers have truly made use of their microteaching experience in their final teaching practice. We asked the trainee teachers the following question: Have you used in your final teaching practice any piece of knowledge gained by self-reflection or from feedback on your or someone else's microlesson? 38.46 % of trainee teachers answered 'yes', 34.62 % gave the answer 'generally yes', 7.69% responded by 'no', and 19.23 % gave the answer 'don't know'.

The examples they gave included psychodidactic, organizational as well as communication aspects.

"The microteaching experience improved mainly the way I assign tasks to students."

"In our reflection on one of the microlessons we realized that when the teacher leans toward the student (or an entire group) while explaining something, this makes a more comfortable and perhaps friendlier impression than the teacher remaining behind the teacher's desk all the time. Standing alone behind the teacher's desk during my final teaching practice did not make me feel good. Frankly, I was very nervous when I was behind the teacher's desk. Once I began walking between desks and kept among the students, my anxiety disappeared. In the end, I made sure I stayed among the students and maintained friendly contact."

One of the trainee teachers had an opportunity to reuse the entire microlesson during his final teaching practice. His description was this: *"In my teaching practice, I made use of the experience acquired from the microlesson and the feedback and self-reflection. My actual class was larger (about 25 students) than our microteaching group, which entailed more noise during group activities but it was not excessive. I expected students to take longer to complete their activities and I was right. Our microlesson in the seminar took about 20 minutes, whereas in the actual school I set more than 30 minutes for it, and we have not completed the whole thing anyway. I was glad to find that the activities we had tried during the microlesson motivated the students and made them cooperate."*

The trainee teachers were grateful for having the freedom of choice of their teaching method while preparing their microlessons. *"As a result, we were able to explore any advanced method that caught our interest and find (even before our final teaching practice) whether it would work well with the students."*

Trainee teachers viewed the didactic inspiration they gained from their colleagues' microlessons as the strength of microteaching. Some of them stated that the feedback from their colleagues helped them deal with constructive criticism.

A weakness of microteaching was seen in that the situations were not authentic. Trainee teachers only experience those during their final teaching practice in schools. Another weakness was seen in the separation of the teaching situation from the rest of the lesson because microlessons are limited by the time frame of 15–20 minutes. However, the case with the 40-minute microlesson proved the ineffectiveness of this kind of practice in a didactics seminar.

The trainee teachers also mentioned the risk of mistakes in specialist knowledge and didactics becoming embedded, despite the thorough follow-up self-reflection, and feedback from colleagues and the supervisor. The reason given for this risk was the powerful experience of microteaching.

Conclusion

When compared to the use of microteaching in general didactics or pedagogy (Bajtoš, Orosová 2011), microteaching in didactics of Czech as a mother tongue benefited from abandoning the lots as a means of choosing the method and the lesson stage in which it is to be used by the trainee teacher; instead the trainee teachers were allowed to choose the method they preferred and a topic they preferred from a thematic unit.

A great majority of trainee teachers found video recordings as the source for microteaching analysis very useful because of the efficient feedback. At the same time, some of them pointed out the risk of the stress related to being videotaped.

Microteaching in tandem was very well accepted. It helped reduce trainee teachers' anxiety associated with video recording and prepared them for future collaboration between teachers which we find very important.

The trainee teachers were also grateful for the fact that the cooperation provided them with deeper insight into the language feature they were explaining and with multiple perspectives on not only language features but also didactic aspects.

Most trainee teachers reported that they had used their experience from microteaching in their final teaching practice.

In contrast to earlier research studies on microteaching (Orosová, Nováková, Juščák 2015) the students of didactics of Czech as a mother tongue did not list the method of providing feedback as a weakness of microteaching analysis. 46.15% of trainee teachers believe that face-to-face discussion is the most effective method. At the same time, 53.85% of trainee teachers prefer anonymous written feedback read by the supervisor. This eliminates the trainee teachers' worry about being critical to microlessons of others.

Appropriate use of microteaching in the seminars of didactics of Czech as a mother tongue meets the fundamental criteria of constructivist instruction: contributes to trainee teachers' motivation, keeps students active, promotes cooperation, conceptual interrelatedness, multiple perspectives and supports self-reflection and providing feedback on colleagues' teaching.

References

Allen, D., & Eve, A., 1968. "Microteaching". Theory into Practice, 7(5), pp.181–185.

Bajtoš, J., Orosová, R., 2011. Mikrovyučovanie v pregraduálnej príprave učiteľov.

Košice: UPJŠ.

Bakir, S., 2014. "The effect of microteaching on the teaching skills of pre-service science

teacher". Journal of Baltic Science Education, 13(6), pp.789–801.

Grossman, P., 1990. The making of teacher: Teacher knowledge and teacher education. New York: Teacher knowledge Press.

Fernández, M. L., & Robinson, M. 2006. "Prospective teachers' perspectives on microteaching lesson study. " Education, 127 (2), pp. 203–215.

Janík, T., 2009. Didaktické znalosti obsahu a jejich význam pro oborové didaktiky, tvorbu kurikula a učitelské vzdělávání. Brno: Paido.

Janík, T., Miková, M., 2006. Videostudie. Výzkum výuky založený na analýze videozáznamu. Brno: Paido.

Kolář, Z. a kol., 2012. Výkladový slovník z pedagogiky. Praha: GRADA,

Mareš, J., 1976. Využití televizní techniky v přípravě učitelů. In: Pedagogika, 26(4),

443 -453.

Mazáčová, N., 2008, "Inovativní přístupy v rozvíjení didaktických kompetencí u studentů učitelství". Metodický portál: Články, http://clanky.rvp.cz/clanek/c/sebereflektivní dotazník/2663/INOVATIVNI-PRISTUPY-V-ROZVIJENI-DIDAKTICKYCH-KOMPETENCI-U-STUDENTU-UCITELSTVI.html, accessed on 5th May 2017.

Murphy, E., 1997. Constructivist checklist, http://www.ucs.mun.ca/~emurphy/stemnet/cle4.html , accessed on 5th May 2017.

Orosová, Z., Nováková, Z., Juščák, J., 2015. "Reflection own activity student student of teaching within the microteaching. " Edukácia, 1 (2), pp. 169-176.

Spilková,V., 1995. "Gradace praktické přípravy, „reflektivní praxe" v novém modelu přípravy na PedF UK.", in: V. Jůva (Ed.), Teorie v pedagogické praxi, praxe v pedagogické teorii v učitelském studiu. Sborník příspěvků z celostátního semináře, Šlapanice u Brna, 7. a 8. února 1995, Brno: Paido, pp. 62-65.

Svatoš, T., 1997. "Od mikrovyučování k mikrovýstupové praxi". Pedagogická orientace, 7(4), pp. 24–28.

ENHANCING DEVELOPMENT OF THE PRE-SERVICE TRANSLATORS' PROFESSIONAL COMPETENCES VIA THE PROJECT WORK: A CASE STUDY

IRYNA SEKRET

School of Foreign Languages
Abant Izzet Baysal University, Turkey

e-mail of corresponding author: irenesekret@gmail.com

Key words: Training Pre-service Translators, Professional Competence, Project Work, ICT Tools, Translation Theory.

Abstract: The study is purposed to shed the light upon of the experience of introducing project work in the pre-service translators' training as a means of enhancing development of their professional competences together with their professional awareness by obtaining early practical insights into translation as a profession. The case study is urged by the fact that while studying at the university and taking theoretical courses on Translation the students tend to loose their learning motivation, being overwhelmed with the theoretical material and unable to adjust theories to their preliminary beliefs about translation as a profession. Having scarcity of the language experience and a conviction that the translator's profession is totally practical, the students come up with constant questioning on the necessity to enter theoretical discourse on translation studies perceiving it as a burden in their training program.

Considering the fact that the theoretical courses on Translation Studies are taught to the students during their first years of the university training and their theoretical immaturity in terms of abilities to comprehend complexity of the translation theories, the author of the study views it as an absolute need to bridge the theoretical knowledge with the real profession of the translator in order to demonstrate to the students a direct connection and cause-effect relations between the theory and practice in the area of translation.

Moved by the specified conditions the project work was designed and implemented into the course "Introduction to Translation" and "Linguistics" in order to bring the students to gain practical insights into the real context of the language functioning and translators' profession via interacting with different social communities, in-service translators, observing translators' work and interviewing them on their actual experiences and professional routines.
Another concern of the case study was to evaluate the project work in terms of its potential to develop professional competences of pre-service translators considering the fact that traditional methods of teaching rather theoretical than practical and rather transmitting the knowledge than constructing and developing competences.
The research entailed such methods as teaching experiment, free and structured interviewing, analysis of the students' reflections on their infield experience, observation.

By this case study it was proved that implementation of the project work allows broadening the context of learning, overstepping the limits of the classroom and complexity of the theoretical input via connecting learning with the actual experiences and communities which deal with languages and translation. Realisation of the project work requires and develops not only knowledge part of the professional competence but involves much broader range of skills and competences which are not attainable under the conditions of the traditional lecturing.

The findings and conclusions of the study are believed to contribute to the methodology of training pre-service translators in terms of applying more effective methods of teaching aimed to facilitate the development of the students' professional competences and their professional awareness.

Introduction

Despite the fact that translation as a craft refers to the oldest one which has been playing a crucial part in all spheres of the human lives, starting from transferring ancient knowledge through times and epochs, negotiating in trading and wars, translating Bible and including modern economical and political discourse, translation as a science continues shaping its subject and methodologies.

In comparison to other sciences which have a long history of developing their methodologies and subject matters translation studies as a science is considered being comparatively new when the urgency to discriminate it from the domain of linguistics was announced in 1950s (Monday 2001; Bernardini 2004).

Considering the fact that the polemics on the scope of the translation studies and its methodological focusses are going on in scientific and professional circles, the problem of training translators, considering the content of the learning programs and teaching methods, remains to be highly disputable.

The dominating perception of translation as a craft and translators as those who perform mechanical and operative work brings the question if the pre-service translators indeed should take courses on the theories of translation, regarding the past practices when translators used to be intensively trained at specialised practical courses and within months became certified to work as translators. Thus, according to the findings of Gümüş (2017), graduates of translation departments see translation theory as rarely important or not important for the profession. The similar results are presented in the research by Katan (2009).

The problems deepen with the fact that students enrolled to the translation departments, after being newly graduated from high schools, and having limited linguistic knowledge and experience, are hardly able to acquire ideas of the theoretical courses on translation studies, struggling with difficulties of tracing the logic of the subject which reflects on the societal changes, general language studies and actual needs for translation. Bulks of the abstract knowledge and terminology which can not be referred to the students' background experience due to the absence of the relevant practices in their past and lack of the global understanding of the history, societal developments, cultures and literatures turn theoretical courses to a kind of formality which students take as a condition just to pass the program. At the same time, according to multiple observations graduates who have not received theory courses fail to use basic translation terminology and adopt more prescriptive approaches to translation (Gümüş, 2017). As Gümüş (2017) notes however, graduates do not complain about learning theory, but about the lack of the link between theory and practice.

Considering the complications mentioned above, and aiming to enhance the content and quality of training pre-service translators according to the needs of the globalised society in the era of information and technologies, this case study was designed with a purpose to try different teaching methods apart of the traditional lecturing mode.

The teaching philosophy which drives this study can be represented via the statement of Scott-Tennent & Davies: "We believe a humanistic and socio-constructivist approach to be highly suitable for specific training in problem-solving in order to create a meaningful and memorable learning experience and to produce significant effects on the trainees' ability to translate." (Scott-Tennent & Davies 2008).

Therefore, this paper is aimed to cover the case of the experimental learning conducted with the university students of the translation department within the theoretical courses “Introduction to Translation” and “Linguistics”.

The experimental learning was purposed to merge theoretical knowledge obtained within the courses with the practical experience which the students were supposed to gain by themselves via the project studies.

As the most of the project studies concerned the specifics of the translation job at different professional settings this experimental learning responds directly to the statement by Beeby (2004): “If the purpose of a degree program is to train professional translators, then learning objectives should be based on a concept of professional competence: what we can know, or discover, about professional translators. The first is to study the translation market to see who translates what and how.” (Beeby 2004).

Problems of Training Pre-Service Translators: Literature Overview in Brief

Methodology of training pre-service translators has been widely disputed about for more than a decade, though the content and methods of training pre-service translators are still under discussion (Kiraly 2005; Al-Hadithy 2015; Ivanova 2016; Gümüş 2017). While most of the researchers and practitioners agree on the point that the training should be directed to the development of competences required to function effectively at the translation market (Gümüş 2017), however, the question, which exactly competences should be in focus, remains to be open. Thus, Bernardini (2004) defines the educational aims of training translators as follows:

Awareness, an ability to see through language to the ways in which messages are mediated and shaped, to construct the meaning and mediate the culture;

Reflectiveness, a capacity to practice, store and use specific strategies and procedures involved in translation;

Resourcefulness, an ability to exploit finite resources indefinitely to cope with new and unexpected challenges, to acquire new resources autonomously, as the need arises (Bernardini 2004).

Discussing the methods of training translators, Al-Hadithy (2015) criticises traditional classrooms for being teacher-centered, uncreative, rigid, and out of date. Under these conditions the learner passively absorbs the passed on knowledge rather than becomes actively engaged in the learning process (Al-Hadithy, 2015).

According to the model model developed for the European Masters in Translation (EMT 2009), it is argued that the "translation service provider" (since this mostly concerns market-oriented technical translation) needs:

- Competence in business ("service provision"),
- Languages,
- Subject matter ("thematic"),
- Text linguistics and sociolinguistics ("intercultural"),
- Documentation ("information mining"), and
- Technologies ("technological") (Pym 2012).

Tan (2008) suggests the model which focuses on the "person-oriented" approach to the translator' competency and training a translator as the 'whole person'. Tan's fundamental sub-competences integrate to create a "whole-person" in the translation student as they include: cognitive competence, communicative competence in the relevant language pairs on the linguistic level, communicative competence in the relevant language pairs on the pragmatic level, transfer competence, technological competence, and instrumental competence. This approach is also argued for by Al-Hadithy (2015).

Dwelling on the problems of defining the translator's competences, Kiraly (2005) refers to the approach by Risku (2002), stating that translation can be seen as 'situated' cognitive activity; that is, it is always undertaken within a particular physical and social setting and interactional framework, with the translator working together with other actors, and with cultural, technical, documentary and linguistic tools and resources to design and create a text, that is, to 'textualize' a new situation (Risku 2002; Kiral 2005). It means that the translator's competences reach far beyond the mere knowledge of the translation languages and abilities to correlate language items from one system with another, but involves thematic, cultural, operational and social components which allow professional translators to function flexibly in the market of always changing demands and expectations towards the end product of translation, i.e. the text.

Concerning the project work in the context of the academic training it should be also mentioned that this approach of teaching has been widely discussed in literature as applied in different learning settings and contexts. As Mackenzie (2004) emphasises learning by doing, knowing-how rather than knowing-that are the fundamental cliches of modern pedagogical theory. In practice it means developing skills in real or simulated situations, arranged by the teacher (Mackenzie 2004). That is exactly what is provided by the project work, i.e. a challenge of solving real tasks in real conditions.

One of the latest statements, transmitted by Scott-Tennent & Davies (2008), strongly advocates the inclusion within translation/interpretation education a teaching methodology formed by humanistic principles and socio-constructivism – where knowledge is shared and acquired in a learning environment that enables positive social interaction and includes real life translation projects whenever possible (Scott-Tennent & Davies, 2008).

Summing up our brief overview of the recent publications in the area of training pre-service translators it can be stated therefore:

1. The main focus of the education should be put on developing competences required by the market;

2. Simultaneously, the professional translator' competences cover a range of components which starts from purely linguistic knowledge and language skills, and then expands, including thematic components, social and cultural competences, digital, documentary, and managerial competences too.

3. Admitting that the traditional methods of training perspective translators do not meet the requirements for providing such a learning environment which would develop translators as active thinkers, creative and flexible personalities able to adjust themselves to the market needs, it is necessary to search for alternative approaches which would enhance learner-centerdness of education.

4. The project work allows the opportunities to enter the real professional world of translators and to learn about the profession and translators while solving real tasks under real conditions. It determines the strong potential of the project work for developing professional competences in a full range of components unlike learning in a traditional classroom which is teacher-centered and based rather on the knowledge transmission than the knowledge construction. Simultaneously, working in projects, conducted in real professional settings, stimulates social knowledge construction which occurs through social and professional interaction between the teacher and the students; among students, with the professional translators, customers, and other stakeholders of translation as a process and a profession.

Methods

The case study reflects on implementing project work into the theoretical courses "Introduction to Translation" and "Linguistics" which are taught to the students of the translation department.

The methods applied during the research contain:

- experimental learning via the implementation of the project work into the context of the courses;
- observation over the students' involvement into the project work, their interaction and participation in the project and the whole course;

- survey in the end of the course which contained multiple choice and open-ended questions to get the students' feedback on the project, problems they encountered, and their attitudes toward such a kind of the learning activity.

The project work was realised through the following stages:

1. *Introducing the project work to the students, its aims and tasks.* At the stage of introducing the project work to the students, it was explained what the project work is, the idea and the purposes of the project work, specifics of its duration and realisation. Most of the students had not any experience of participating in the projects before that was why the clear explanation and step-by-step guiding was required.

2. *Defining the topics for the project studies.* To facilitate specifying the topics for the students' interests to choose for their further project studies, the overview of the course curriculum and content was done in the very beginning of the course. In the overview of the course content, the instructor covered briefly each topic within the course, problems which are under the discussion within each session. It allowed the students to get a general idea of the course material, and to define the subject for their future project research.

3. The w*hole class brainstorming.* After introducing the idea of the project work and the content of the course, the whole class brainstorming took place. During this time the students asked questions concerning the specifics of the project as a type of the learning activity, reflected on the course content, highlighted the research problems within the course which evoke their interest.

4. *Establishing teams and developing the project idea.* The students were suggested to form teams according to their wishes and preferences with the only requirement not to exceed the number of four participants in the group. The students tended to choose the peers with whom they have more close friendly relations, also the preference was given to those peers with whom they previously had positive collaborative experience. There were also those who desired to make a project by themselves, in response they were provided with the explanation of the reasons why it is better to set up teams for the project and encouraged to find partners for collaboration. Then the students were introduced to the general outline of the project research and suggested to develop their own idea for their team study and to outline the process of the project tasks realisation. The requirement to the project idea was to make it experimental i.e. to make research in interaction with the communities on the issues of the research problem. The students supposed to do it in the team brainstorming and to present their initial project plans after 30 - 40 minutes of the team in-class discussion. After the team brainstorming the group presented their project idea in front of

the class, the peers were commenting on the plans, giving their advice on the methods and procedures of the studies. After initial presentation the teams were supposed to finalise their project proposals by their own, including amendments and recommendations expressed in the classroom by the peers and the instructor, and present in a week at the next class period. The presentation of the project propose was required to have the following outline:

- the subject of the research;
- its connection to the topic of the course;
- reasons of choosing this subject for the study (topicality);
- the team members;
- methods of the research;
- instruments (e.g. survey, interview);
- equipment (technical tools e.g. video camera, audio recording, etc. ICT applications);
- target audience (who is intended to be interacted with);
- procedures;
- deadlines;
- how responsibilities are shared in the group;
- anticipated outcomes of the project (e.g. obtained knowledge, skills, possible impact of the project on the other learners / communities, course, etc).

5. *Deciding on ICT tool for communication and sharing.*

6. *The project realisation and presenting the ongoing reports in the classroom*. The students were supposed to report on their projects in the process of its realisation with a provision of the supporting video / audio recordings, data gathered and other documentations. The common deadlines were established for the following stages:

- presenting the project proposal according to the provided framework;
- outlining the target audience / respondents (number of the participants intended / targeted and the real number of the respondents which were going to be involved with the provision of the social information of the participants, letters of consent, permissions, etc.);
- presenting the instruments of the research (the students were supposed to design their questionnaires / interview questions according to the subject of their research problem in order to elicit

required data and information);

- findings and results of the research.

7. *Students' conference.* On the basis of the reports from the project work fulfilled by the students from both of the two courses the conference on translation and language studies was organised. The students themselves designed the logo, poster, and were responsible for the organisational issues of the conference. Later on other students and instructors expressed their desire to join the conference by preparing posters on the topics of their concerns within other courses on translation studies.

The number of the students enrolled in the courses and participating in the project work is 12 for *Linguistics* (the second year students) and 28 for *Introduction to Translation* (the first year students).

Instrument for collecting students' feedbacks.

To collect the students' feedbacks on the project work a special questionnaire was designed. It included multiple choice and open ended questions. The questions reflected on the involvement of all the members in the group work, sharing responsibilities, usage of ICT tools, pros and cons of the project work. The main questions from the survey are listed below:

- How many students were in your project group?
- How did you share responsibilities?
- Do you think everybody equally contributed to the project? Yes / No
- What ICT tools did you use in your project study?
- What did you like the best in the project and all its duration?
- What was the most troublesome? What did you dislike the most?
- What are the advantages and disadvantages of such kind of work?
- What would you suggest for improving the work?

Results

*Observations over the students' involvement in courses before, during and after the project work***.** As it was mentioned above the idea to implement the project work into the context of the theoretical courses was driven by the intention to merge theoretical knowledge with practice and experience, and the observations over the decrease of the students' motivation to learn and their concerns about their future profession and positive prospects of the career in the area.

The decrease of the learning motivation was projected in lowering students' participation in the class

discussions, skipping home assignments, decrease in the overall rates of grades and absenteeism. The concerns about the profession, learning and career were expressed in questions i.e. if we will be able to find job; if we are capable enough to become translators; what I should do to get employed; translators won't be needed because of the technological advances, what we are learning is not important for the profession, etc. Along with the personal reasons, the scepticism about the learning and career was also evoked by the global tendencies of instability and economical crisis, being overwhelmed with the information on the technology usage for translation and unemployability. Besides, the lack of the sufficient prior experience and knowledge among the students on the language analysis, communication, and literature made understanding the courses material more complicated.

The introduction of the project work was a novice for most of the students as far as nobody of them had ever been involved in such a kind of activity, therefore, it evoked curiosity and excitement. The excitement and anxiety concerned mostly the issues connected with leaving the classroom space and interacting with outside experts to collect responses according to the problems of their research.

During the project work the attendance of the classes significantly raised, reasoned by the obligation to present their work in group, a desire to show their achievements and to share obtained experiences as well as to watch other peers' performances.

The students participated much more enthusiastically in discussions, demonstrating genuine interest in presenting and sharing their experiences.

As far as the theoretical courses continued to be given in lectures once per week during the semester (18 weeks) the students gained theoretical and practical insights on the topics of their courses prior to the scheduled lectures while working at their projects and observing their peers studies. It facilitated acquiring the topics in a more durable and profound way. While lecturing and explaining theories it was possible to refer the students' findings and experiences in the projects to exemplify theoretical assumptions with practical cases.

The content of the courses was reflected in the students' project research (Table 1, 2).

TABLE 1. THE CONTENT OF THE COURSE "INTRODUCTION TO TRANSLATION" (FOLLOWING THE BOOK "BECOMING A TRANSLATOR. AN ACCELERATED COURSE'" BY D. ROBINSON, 2000) AND THE TOPICS OF THE STUDENTS' PROJECTS	
Topics of the course	**Topics of the students' projects**
External knowledge about translation: the user's view Internal knowledge about translation: the translator's view The Translator as a Learner The Process of Translation Experience in Translation People and Translation Translation and Terminology Language Study and Translation Social Networks Tools and Resources in Translator's Profession Importance of Analysis in Translation	Translator as a Learner Specifics of Technical Translation How to become a better Translator and Interpreter: Professional Insights into the Simultaneous Translation How to Deal with Technical Terms in Translation Social Media in Translation: Professional Experience
Source: Own	

TABLE 2. TABLE 1. THE CONTENT OF THE COURSE "LINGUISTICS II" (FOLLOWING THE BOOK "CONTEMPORARY LINGUISTICS", ED. BY W. O'GRADY & J. ARCHIBALD, 1997) AND THE TOPICS OF THE STUDENTS' PROJECTS	
Topics of the course	**Topics of the students' projects**
The classification of languages History of language First language acquisition Second language acquisition Psycholinguistics: the study of language processing Neurolinguistics: Brain and Language Sociolinguistics: Language in Social Context Natural Sign Language Writing and Language Computational Linguistics	Sociolinguistic Study: Evaluation of Halo Effect and People's Reaction Sign Language Study: Communicating with the Basic Gestures First Language Acquisition Study: Language of the Children in the Age of 2 - 6 years old Evaluation of the Second Language Education in Turkey Second Language Acquisition Study: Comparison of the Compulsory and Voluntary
Source: Own	

Separately the issues on the group dynamics should be mentioned. They concern the processes on changing the content of the group during the work because of dropping some members, or a decision to change the group. Such processes were allowed at the initial stages of the project realisation but restricted by the end of the project work unless changes were truly needed, justified and accepted by all parties. There were cases when the group disintegrated and one individual took up all the responsibilities for finalising the project.

The most challenging part in realising the project research was to connect with outside experts and to get their responses on the issues of the study. Depending on the course and project contents the students had to reach respondents in different communities, e.g. technical translators, simultaneous interpreters, experts in subtitle translation, conference translators, English language learners in Turkey and abroad, young learners, Turkish language learners, passersby, etc. in order to obtain data according to the aims of their studies. For this purpose they tried to reach their target recipients via social media (Facebook, Twitter, translators forums, etc.) or to address to them personally. Sometimes their requests were rejected and the students felt frustrated and belittled by such failures, it became a cause for a need to deal with

negative emotions through analysing possible reasons of rejections and ways of copying with them.

Another frustrating factor was connected with a requirement to present the final reports on the projects in public at the conference which was supposed to be attended by other instructors and students. To cope with the fears and lack of confidence and also to enhance the quality of presentations and speaking skills in public there was a need to make previous rehearsals for the students to help them adjust themselves to the environment of the conference hall, speaking from the stage and interacting with the audience in the hall.

On the top of the gained experiences was organising a conference according to all academic requirements. The preparatory stage went through the following stages:

- developing the idea and framework of the conference;
- group discussion of the conference logo, agreeing on its content and design, implementation (Picture 1);
- developing the conference program and its poster;
- leading the conference;
- speaking at the conference and participating in the follow-up discussions;
- providing summary translations to the presentations.

The most valuable impact of the conference was in providing the students with a sense of accomplishment and satisfaction of the work fulfilled. Based on this experience they all became excited about an idea to continue such kind of activities during the following year and organising another conference which would include participants from other universities and countries.

PICTURE 1. POSTER OF THE CONFERENCE

Source: Own

Survey Data Analysis: Students' Feedback

The students' responses to the survey provided valuable information on the process of the project work and their insights on the ways how to improve this type of learning activity or to avoid it in the future teaching.

The survey forms were filled and returned by 28 students who participated in the project.

The questions and the answers are organised in the table below (Table 3).

TABLE 3. STUDENTS' FEEDBACK ON THEIR PARTICIPATION IN THE PROJECT WORK

Question	Answers	Percentage of mentioning, %
How many students were in your project group?	1 2 3 4	8% 22% 42% 28%
How did you share responsibilities?	We shared responsibilities based on our abilities. We shared responsibilities before starting to work on our project When we began the project, we didn't share the responsibilities. It happened spontaneously. And also we shared it by skills.	80% 10% 10%
Do you think everybody equally contributed to the project? Yes / No	No Yes	32% 68%
What ICT tools did you use in your project study?	Audio recordings (smartphones) - to record interviews Sony Vegas - to add subtitles and edit videos Audacity - for editing recordings Power Point - to prepare presentation Excel 2016 - to make statistics Word 2016 - to make notes about translation Sony Audio Recorder version 2.00.30 - to record interview Social media (Tumbir) - to interview freelancers Google translate - for translating unknown words Google forms - to prepare survey Tureng - for translating	
What did you like the best in the project and all its duration?	Opportunity to present my project in front of people I liked interviewing professional translators and meeting people of profession The part I liked the most was during the conference. That was excellent experience for us. This project has taught me how to work on a project with people who has absolutely different point of view about life. The best part of this project for me is feeling more confident about myself and my academic skills. I like that we gained experience not only about the translation but also about ICT tools like Sony Vegas, Audacity etc. Analysing comments of the respondents Even though I was sleepless many nights I've learned how to use Sony Vegas I still keep using this program. Chance to see what people think	40% 30% 30% 20% 15% 30% 10% 10% 10%
What was the most troublesome? What did you dislike the most?	Finding the translators (respondents) was the hardest part. I didn't like that part I was always interacting with the group in this process, we met almost every weekend and we paid more attention to this than the other lessons. I'm tired too much. The changes in presentation after we completed it.	60% 20%

	Preparation of the speech and keeping it in mind, I guess. Arranging free time with my partner was the biggest problem. I dislike working with someone who is not wholly devoting himself/herself to school. The most troublesome thing was that we were not informed enough about our project.	20% 2% 2% 20%
Advantages:	Getting in contact with translators Presenting Learning more about translation Doing mini surveys Translating interviews Effective interaction-motivation Bringing us together Improving communication with people Gaining experience Getting knowledge about the market Making translations Experiencing standing on the stage and speaking in front of people Improving speaking skills Improving self-esteem Learning what to do after graduation Gaining experience about ICT tools Understanding group work and how people act better	50% 40% 30% 20% 30% 10% 20% 10% 40% 15% 20% 30% 20% 10% 10% 40% 20%
Disadvantages:	Getting in contact with translators takes much time Being inexperienced about presentation No disadvantages Takes very long time and effort Stressful Limited time Limited topics	40% 20% 20% 40% 40% 10% 10%
What would you suggest for improving the work?	Maybe next time we, students, will be better at presenting, students need to have more experience of presenting in public Before starting project, the teacher should give the students all the important points of the project for the purpose of not destroying the works and efforts of the students. We should better announce about the conference for more people to know about it and benefit from it Maybe next year students can work at their projects from the first semester in order to work more and present more effective data at the conference Inform the participants more to make them work efficiently, considering that it was the first time that they were doing something so serious Receiving funds for the project application. Reaching more students from a variety of schools.	10% 30% 30% 20% 10% 20%
Source: Own		

Based on the students' feedbacks it should be stated that the realisation of the project work required and developed not only the knowledge part of the professional competence but involved a much broader range of skills and competences which are not attainable under the conditions of the traditional lecturing. They include:

• developing professional competence through immediate transmission of the theoretical knowledge into the practice, and visa versa, of the gained experience into the theoretical assumptions;

• applying professional skills, namely, in translating literature, speeches, discussions, providing summary translation, subtitle translation, etc;

• enhancing social competence while addressing to unknown people, and getting their content to collaborate;

• developing digital competence and shaping it to the professional needs of translation via using social media when reaching professional communities, following and participating in the professional forums, communicating with distant respondents via messaging, forums, or video conferencing tools; processing video and audio recordings with the provision of subtitles;

• developing presentation skills and speaking in public;

• enhancing English language competence as a whole;

• enhancing emotional awareness when dealing with failures and critics;

• abilities to work in group and reach the project aims mutually;

• developing conflict resolution skills in the group in cases of the interests conflict, sharing responsibilities, taking on duties, etc;

• enhancing decision taking skills based on the evidences and reasoning;

• organisational skills in managing the conference and holding the event;

• designing skills in developing the logo and poster of the conference;

• developing academic competence on designing the research and realising it according to the requirements to the academic study;

• developing professional self-awareness and establishing themselves in the profession of translation (to add to the last statement, some students took a decision to take up summer work as subtitle translators and interpreters in the tourism sector).

In the end of the courses the positive tendency was also noticed in the overall rise of the scores and grades at the final examination. But it also should be noted that the students, who used to participate and attend the courses but still having low grades, indeed demonstrated significant positive changes in their rates after the project work, while those, who used to fail, they remained to be in the same position. In the beginning of the project work they were making some attempts to perform and were encouraged by the instructor to go on but later on they dropped their groups without finalising their duties.

Implementation of ICT tools during the project work: Social Media and Other Tools

Oral presentations of the students were video recorded during all the project work and some of them were uploaded in the closed Facebook group "Translation: Project in Process". In that virtual space some announcements were posted as well.

Discussing the ICT tool for sharing, not all the students were in favour of establishing the Facebook group for sharing, due to such factors as: a) absence of the Facebook account; b) concerns of becoming a "friend" with the instructor; c) being seen by other Facebook users.

Reluctance to join Facebook in most cases was caused by the ethical and cultural issues. Besides, the students had been already using WhatsApp for sharing and communication in their group and were satisfied with this tool for such interaction.

Responding to such concerns, the reasons of Facebook implementation were explained, mostly referring to the technical limitations of WhatsApp on sharing video and audio materials of bigger volume than messages.

Considering these issues it was decided to establish a closed Facebook group, which was joined by those students who were having Facebook accounts. The others were supposed to get updates via WhatsApp from the Facebook group followers.

One of the students was assigned as a moderator of the Facebook group with the right to add new members. All members of the group were allowed and encouraged to post their presentations, materials and comments.

Analysing activities of the Facebook group it should be noted that most of the members remained to be passive viewers, and only those, who generally used to demonstrating an active behaviour in Facebook, posed themselves as active members of the group with uploading their materials and commenting on the posts.

Together with that, as it was mentioned earlier, the students' digital competences received considerable enhancements according to the actual professional needs in the area of translation and interpreting. Its development occurred through the following activities:

using social media to reach professional communities,

following and participating in the professional forums,

communicating with distant respondents via messaging, forums, or video conferencing tools;

processing video and audio recordings with the provision of subtitles;

processing text information and designing presentations;

analysing internet resources on the issue of their relativity to the subject of the research and the validity of the provided information, etc.

During the project work, the students applied a range ICT tools:

Audio recordings (smartphones) - to record interviews;

Sony Vegas - to add subtitles and edit videos;

Audacity - for editing recordings;

Power Point - to prepare presentation;

Excel 2016 - to make statistics;

Word 2016 - to make notes about translation;

Sony Audio Recorder version 2.00.30 - to record interview;

Social media (Tumbir) - to interview freelances;

Google translate - for translating unknown words;

Google forms - to prepare survey;

Tureng - for translating.

Some of the students in their feedbacks just mentioned computers and smartphones which points to their little awareness of the ICT tools they are applying in practice.

Conclusion

1. Implementation of the project work allows broadening the context of learning, overstepping the limits of the classroom and complexity of the theoretical input via connecting learning with the actual experiences and communities which deal with languages and translation.

2. It became obvious that realisation of the project work requires and develops not only knowledge part of the professional competence but involves much broader range of skills and competences which are not attainable under the conditions of the traditional lecturing. These include: a) developing professional competence through immediate transmission of the theoretical knowledge into the practice, and visa versa, of the gained experience into the theoretical assumptions; b) professional skills in translating literature, speeches, discussions, providing summary translation, subtitle translation, etc; c) enhancing social competence while addressing to unknown people, and getting their content to collaborate; d) developing digital competence and its shaping according to the professional needs, for example, using social media for

reaching professional communities, following and participating in the professional forums, communicating with distant respondents via messaging, forums, or video conferencing tools; processing video and audio recordings with the provision of subtitles; d) developing presentation skills and speaking in public; e) enhancing English language competence as a whole; f) enhancing emotional awareness when dealing with failures and critics; g) abilities to work in group and mutually reach the project aims; h) developing conflict resolution skills in the group in cases of the interests conflict, sharing responsibilities, taking on duties; j) enhancing decision taking skills based on the evidences and reasoning; k) organisational skills in managing the conference; l) designing skills in developing logo and poster of the conference; m) developing academic competence on designing the research and realising it according to the requirements to the academic study; n) developing professional self-awareness and establishing oneself in the profession of translation.

3. Implementation of the project work effects positively on the students' involvement in the classroom discussions, attendance, motivation to research and present on their personal achievements.

4. The project work demonstrates tendencies to increase the rates and overall learning performance among those students who used to attend classes but having low grades due to the lack of knowledge or self confidence. Those who used to fail, they do not improve their situation due to the inconsistency in their personal performance and failing to compete their duties. Therefore, it can be assumed that teaching strategies are able to enhance the learning performance of the students who remain to be involved in the class while constantly failing students continue dropping out.

5. The drawbacks of the project work include: a) increased time and efforts on the realisation of the work according to the requirements; b) emotional stress caused by the challenges of interacting with communities and reporting on the results of the project work.

6. To enhance the quality of the project work the students must be supplied with all necessary instructions on each step in the project and their purposes, the instructions should be provided not only orally, as still some information may be misunderstood or misinterpreted, but in a written form too in order to assure the clear understanding of the requirements and expectations.

References

Beeby, A., 2004. "Language Learning for Translators", in: K. Malmkjer (Ed.), Translation in Undergraduate Degree Programmes, John Benjamins Publishing Company, p. 41.

Bernardini, S., 2004. "The theory behind the practice. K. Malmkjer (Ed.), Translation in Undergraduate Degree Programmes", Ed. by K. Malmkjer. John Benjamins Publishing Company, p. 23.

EMT Expert Group, 2009. “Competences for professional translators, experts in multilingual and multimedia communication” http://ec.europa.eu/dgs/translation/programmes/emt/key_documents/emt_competences_translators_en.pdf accessed 23rd August 2017.

Gümüş, V., 2017. “Training Translators for the Market in Turkey: What Should We Teach to Future Translators?”. International Journal of Comparative Literature & Translation Studies. Vol. 5 No. 1; January 2017. Australian International Academic Centre, Australia. http://www.journals.aiac.org.au/index.php/IJCLTS/article/view/3073/2542 accessed 23rd August 2017.

Ivanova, O., 2016. “Translation and ICT competence in the globalized world”. International Conference; Meaning in Translation: Illusion of Precision, MTIP2016, 11-13 May 2016, Riga, Latvia. Procedia - Social and Behavioral Sciences 231 (2016), pp. 129 – 134.

Katan, D., 2009. “Translation Theory and Professional Practice: A Global Survey of the Great Divide”. Hermes – Journal of Language and Communication Studies no 42-2009, http://download2.hermes.asb.dk/archive/download/Hermes-42-7-katan_net.pdf accessed in 23rd August 2017.

Kiraly, D., 2005. “Project-Based Learning: A Case for Situated Translation. Translation." Meta 50 (4) pp. 1098–1111.

Mackenzie, R., 2004. “The competencies required by the translator’s roles as a professional”, in: K. Malmkjer (Ed.), Translation in Undergraduate Degree Programmes,. John Benjamins Publishing Company, p. 33.

Monday, J., 2001. “Introducing Translation Studies: Theories and Applications”. London and New. York: Routledge, pp. 222.

O’Grady, W., Archibald, J., 1997. “Contemporary Linguistics: An Introduction”, in W. O’Grady & J. Archibald (Eds.). Person Education. United Kingdom.

Pym, A., 2012. “Translation skill-sets in a machine-translation age” http://usuaris.tinet.cat/apym/on-line/training/2012_competence_pym.pdf, accessed 23rd August 2017.

Risku, H., 2002. “Situatedness in Translation Studies,” Cognitive Systems Research 3, pp. 523-533.

Robinson, D., 2000. Becoming a Translator. An Accelerated Course London and New York.

Scott-Tennent, Ch., Davies, M., 2008. “Effects of Specific Training on the Ability to Deal with Cultural References in Translation”. Meta 53 (4): pp. 782–797.

Tan, Z., 2008. “Towards a whole-person translator education approach in translation teaching on university degree programmes”. Meta, 53 (3), pp. 589-608.

BILINGUAL E-GLOSSARY OF FOREIGN LANGUAGES AND CULTURES TEACHING (ENGLISH AND UKRAINIAN)

YANA FABRYCHNA

Translators' and Interpreters' Faculty
Kyiv National Linguistic University

e-mail of corresponding author: yanafabrichnaya@rambler.ru

Key words: bilingual e-glossary, English, Ukrainian, subject-field terms, foreign languages and cultures teaching, Google Site.

Abstract: Integration of Ukrainian higher education into the world educational and scientific research area provides Ukrainian scholars with the possibility to take part in the intercultural communication in the field of foreign languages and cultures teaching in particular. It involves reading, translating or writing professional texts in English. To avoid confusion while dealing with texts of different types it is important to use proper terminology. In this connection we argue that using the bilingual e-glossary will help to maintain consistency of terminology and favour intercultural communication in foreign languages and cultures teaching domain.

This paper deals with the bilingual e-glossary of subject-field terms in foreign languages and cultures teaching field. The e-glossary is intended to be a database containing key terminology in English and Ukrainian as well as a tool for assisting student teachers, advanced students and other experts in foreign languages and cultures teaching to confidently use profession specific terminology.

An English-Ukrainian e-glossary includes 400 lexical units and a Ukrainian-English e-glossary contains 354 lexical units denoting main concepts of methodology, pedagogy, linguistics, theory and practice of translation, information communication technology, abbreviations.

Main principles of bilingual e-glossary content building and criteria for subject-field terms selection are considered. The procedure of foreign languages and cultures teaching subject-field terms selecting is reviewed. Further benefits of using e-glossary while reading, translating and writing professional texts on foreign languages and cultures teaching are outlined. Main advantages over other translation tools are distinguished.

A Google Site as a software solution to provide online access to e-glossary and a centralized collaboration venue for the foreign languages and cultures teaching field experts is suggested.

Introduction

Integration of Ukrainian higher education system into the world educational and scientific research area provides members of Ukrainian academic community with the access to the latest scientific achievements as well as gives the possibility to share our own experience, results of theoretical and practical studies in the field of foreign languages and cultures (FLC) teaching in particular. Nowadays, Ukrainian scholars involved into FLC teaching actively participate in the intercultural professional communication.

Ukrainian scholars' participation in intercultural communication in the FLC teaching domain involves various activities. First of all, it is organizing (announcing terms, calling for papers, informing about guidelines for manuscripts, deadline for submission and their evaluating, compiling conference program and schedules, planning plenaries, sessions and workshops by organizing committees) and taking part in (submitting of papers, participating, preparing and presenting reports, studying conference materials by participants) international conferences on FLC teaching issues. Then, goes research and procedure development which means preparing and publishing academic articles, manuals, books, diploma thesis, dissertations, reviews, summaries. FLC teachers' professional development is impossible without studying the latest researches in FLC teaching field with the view to improving skills to manage the learning environment, using technological tools and resources.

Intercultural professional communication in FLC teaching field involves interacting and communicating between individuals or groups belonging to the same professional, academic and educational environment related to FLC teaching methods, however, members of different national,

cultural and linguistic communities. This communication occurs via means of professional language and in a culture-specific context (Yutskevych 2002, 150–153).

Professional language functioning is provided by consistent terminology (Kyyak 2007). It is the terminology which ensures the informative value, content, exactness, coherence and unambiguity of line of thought (Semenoh 2010). Culture-specific context means that the participants of the communication are the representatives of different language and cultural communities with historically developed social norms, values, knowledge and activities. These socio-cultural peculiarities are reflected in lexical units denoting objects or phenomena that are unique to a specific language and cultural community and have in the target language no lexical equivalents (Korunets' 2003). Dealing with realia can be rather confusing. To avoid confusion while reading, translating or writing professional texts of various types it is important to use proper terminology. The above mentioned motivated us to compile the bilingual e-glossary of FLC teaching terms in English and Ukrainian. We argue that using the bilingual e-glossary will help Ukrainian scholars involved into the intercultural communication in FLC teaching domain to maintain consistency of terminology, avoid confusing while dealing with realia, ensure the efficiency of information and ideas exchanging, getting acquainted with best studies and practices, experience sharing.

Literature review of studies dealing with compiling and using term dictionaries and glossaries of terms have revealed that there are certain achievements in the field of research. Thus, theoretical framework is outlined by fathers of terminology Wüster (1968), Felber (1983), Cabré (2003), Ukrainian researchers and translators Korunets' (2003), Karaban (2003), Kyyak (2007) to name just a few. Features of compiling specialized glossaries are described by Amelina (2013). Recently, several research works dealing with various terminological systems have been published in Ukraine. Each of them serves as an information base for all concerned with intercultural communication in a particular professional domain: English-Ukrainian Dictionary of Library Terms (Strishenets 2005), Explanatory Dictionary of Medical Terms (Lytvynenko, Misnyk 2010), glossary of commercial documents terminology (Pasichnik 2011), The Dictionary of Ukrainian Biological Terminology (Hrodzynskyi, Symonenko, Hodovana 2012), English-Ukrainian Nanoscience Guide (Radzievska, Chekman 2013). However, no research that surveyed in a contrastive aspect English and Ukrainian FLC teaching terminology has been found.

This paper gives an account of the process of the bilingual e-glossary of subject-field terms in FLC teaching field development. In the pages that follow, with the respect to practical purposes of the present research, main principles of term glossary content building and criteria for subject-field terms selection are considered, the procedure of FLC teaching subject-field terms selecting is reviewed, benefits of using bilingual e-glossary while reading, translating and writing professional texts on FLC teaching are outlined, main advantages over other translation tools are distinguished. A choice of

Google Site as a software solution to provide online access to e-glossary and a centralized collaboration venue for the foreign languages and cultures teaching field experts is grounded.

Methods

E-glossary of FLC teaching terms is compiled with the respect to the main principles and methods for standardizing terminologies (Felber 1983; Cabré 2003), main criteria for terms selection (Cabré 2003; Korunets' 2003; Karaban 2003; Pasichnik 2011), general guidelines and peculiarities of developing specialized glossaries of terms (Amelina). The process of developing consisted of several stages.

The initial stage of the present research was the analytical review of studies on terminology aimed at finding out the main approaches to standardizing terminology, principles of compiling subject-field glossaries and criteria for terminology selecting. First of all, it revealed that the main objective of a specialized glossary is to register subject-field terms which can be described as terminological units produced within the framework of specialized communication and in a specialized discourse (Cabré 2003). A terminological unit covers the concept, the term, the situation components (pragmatics). It is a means of professional expression and communication and part of a system for representing the knowledge within special areas of science (Cabré 2003; Karaban 2003). Following the definition of a term we view a FLC teaching subject-term as a lexical unit of special meaning which is concise, has precise and unambiguous correspondence with the concept, and distinguished by systematic use as a means of professional communication in the FLC teaching area. Taking into consideration the perspective of practical use of the e-glossary for translation, the selected FLC teaching subject-field terms should be evaluated by the criteria of equivalence, adequacy, precision and economy (Cabré 2003; Korunets' 2003; Karaban 2003).

The second stage of the research involved selecting English and Ukrainian parallel (style, genre and subject identical) texts on methods of FLC teaching as reliable sources of subject-field terms. To provide reliability and accuracy we analyzed in a contrastive aspect 150 English and 150 Ukrainian texts taken from authentic English and Ukrainian editions: books, manuals, studies, journals, materials of scientific conferences, reference guides, electronic periodicals which cover currently central and profession significant issues for intercultural communication in FLC teaching field. With the respect to the criteria of informative value, pragmatics, subject correspondence, translation value, typological and genre diversity (Borysko 2000; Bochkareva 2007; Koreyba 2010; Pasichnik 2011) 64 (32 English ad 32 Ukrainian) parallel texts (calls for papers, submission guidelines, conference programmes, reports, studies, dissertations, academic articles, paper abstracts, conference abstracts, reviews, manuals, thesis) were selected. See Table 2 with the examples of parallel texts.

TABLE 1 EXAMPLES OF PARALLEL ENGLISH AND UKRAINIAN TEXTS ON FOREIGN LANGUAGES AND CULTURES TEACHING

English	***Ukrainian***
Call for papers for Eighth International Conference on Language Teacher Educator Conference: Preparing Language Teacher Educators to Meet National and Global Needs, May 30–June 1, 2013, http://nclrc.org/LTE2013/CallforPapers.pdf, accessed on May 13th, 2017.	Інформаційний лист-запрошення до участі у Міжнародній науково-практичній конференції "Україна і світ: Діалог мов та культур", 19–21 березня 2014 р. – КНЛУ, 2 с.
Lee, L., 2013. Blogging: Promoting Learner Autonomy and Intercultural Competence through Study Abroad, Language Learning & Technology, Volume 15, Number 3, pp. 87–109.	Драненко, Г. Ф., Руснак, Д. А., 2013. Дидактичні властивості блогу в організації навчання французької мови студентів мовних спеціальностей, Вісник КНЛУ. Серія педагогіка та психологія. Випуск 22, С. 211–216.

The next stage of the study was the contrastive analysis of English and Ukrainian parallel texts with the respect to their lexical peculiarities (Fabrychna 2013). The analysis results showed that the informative value, content, exactness, coherence and unambiguity of line of thought in the English and Ukrainian texts on FLC teaching are ensured by specialized lexical units representing the following fields of studies: methods of teaching (Eg.: *communicative competence, productive skills / іншомовна комунікативна компетентність, види мовленнєвої діяльності*); pedagogy (Eg.: *assessment, curriculum / навчальна діяльність, рефлексивний підхід*), psychology (Eg.: *intrinsic motivation principle, visual style / зорове сприйняття, індивідуальні особливості*), linguistics (Eg.: *discourse, spelling / лексична одиниця, семантичне поле*), theory and practice of translation (Eg.: *transformation, source language / мова перекладу*). There are also general academic terms (Eg.: *general notions, needs analysis / функціонування, класифікація, типологія*); buzzwords (Eg.: *warming-up, brainstorming / вікно, заліковка*); common lexical units (Eg.: *process, attention / інтеграція, компонент*); abbreviations and acronyms (Eg.: *EAP – English for Academic Purposes, PPP – presentation, practice, production / ІМіК – іноземні мови і культури, АЛК – англомовна лексична компетентність*); information communication technology (ICT) terms (*interactive whiteboard – інтерактивна дошка*); emotive lexical units in English texts (Eg.: *an increasingly important area, the latter point has been devastatingly critiqued*).

The contrastive analysis also allowed us to define socio-cultural peculiarities of the English and Ukrainian parallel texts reflected by lexical units which denote realia. They are: names of people (Eg.: *Christiane Nord / Пасов Ю. І.*); positions (Eg.: *Professor Emeritus / аспірант*); geographical names (Eg.: *Connecticut / Чернігів*); names of books (Eg.: *Discourse Analysis for Language Teachers / Практичний курс перекладу (англійська та українська мови)*; names of journals (Eg.: *The Internet TESL Journal / Вісник КНЛУ*); names of organizations (Eg.: *The George Washington University / Національна бібліотека України ім. В. І. Вернадського*); conferences (Eg.: *Women and Foreign Languages in Modern Europe / "Мови у відкритому суспільстві"*). See the lexical peculiarities of

English and Ukrainian texts on foreign languages and cultures teaching terms in a contrastive aspect in Table 1. The occurrence of particular lexical peculiarities in the texts is denoted by "+" sign while their absence by "–" sign.

TABLE 2 LEXICAL PECULIARITIES OF ENGLISH AND UKRAINIAN TEXTS ON FOREIGN LANGUAGES AND CULTURES TEACHING TERMS

Lexical peculiarities	***English***	***Ukrainian***
1. Use of subject-field terms (methodological, pedagogical, psychological, linguistic, general academic, buzzwords, ICT)	+	+
2. Use of common lexical units	+	+
3. Use of abbreviations and acronyms	+	+
4. Use of emotive lexical units	+	–
5. Use of proper names	+	+

The next stage provided the compiling paper versions (English-Ukrainian and Ukrainian-English) of the glossary according to the requirements to the qualitative and quantitative composition of the basic vocabulary for teaching foreign languages and cultures (Nikolaieva 2013). In accordance with the criteria of pragmatic use, frequency, equivalency, precision of correspondence with the concepts, social and cultural values (Cabré 2003; Korunets' 2003; Karaban 2003; Pasichnik 2011) 396 English lexical units and 351 Ukrainian lexical units denoting main concepts of methodology, pedagogy, linguistics, theory and practice of translation, information communication technology, abbreviations were included into the glossaries.

After making an inventory of subject-field terms available in the field of FLC teaching and examining the collected ones in order to identify the individual or specific concept (Felber 1983; Shunevych 2000) scholars suggest ways of arranging subject-field terms in a glossary. Regarding the peculiarity of the glossary compiled we chose the alphabetical order of terms arrangement.

In the process of finding equivalents to terms in both English and Ukrainian there were used different ways of rendering subject-field terms (Korunets' 2003): practical transcription (Eg.: *discourse – дискурс*); transliteration (Eg.: *strategy – стратегія*); direct translation (Eg.: *communicative competence – комунікативна компетентність*); componental translation and some replacements, omissions, or substitutions arising from the national peculiarities of the target language, i.e. depending on its stylistic mode of usage (Eg.: *homogeneous parts of the sentence – однорідні члени речення*); descriptive translation (Eg.: *teaching – педагогічна діяльність*). The combination of definition analysis and context analysis has been used in translation of abbreviations and acronyms (Korunets' 2003, Karaban 2003) (Eg.: *CALL – computer assisted language learning – навчання іноземної мови за допомогою комп'ютера).*

In order to provide reliability and accuracy of the selected terms and their equivalents in the target language we used glossaries, dictionaries whose contents related to the subject field of FLC teaching

methods. They are: Glossary on the Bologna Process, Glossary ECML Programme 2008–2 011 "Empowering Language professionals", Teaching knowledge database (British Council), A Handbook of English-Russian Terminology for Language Teaching, Glossary of Instructional Strategies.

It should be mentioned that after the paper versions of glossary were published (Fabrychna 2015; 2016) we had a certain number of comments from Ukrainian scholars upon its efficiency while dealing with professional texts. The researchers, especially those whose first foreign language is not English, admitted that the glossary helps them ensure that each time a defined term appears in a corresponding language, it is used consistently and correctly. However, some drawbacks of paper versions of the glossary have been discovered.

First of all, the paper versions don't provide immediate and easy access to the information needed. Although the items in the glossary are arranged alphabetically, to look up a particular term the user has to make a complete search of it, which can be time-consuming. Another main disadvantage of paper glossaries is once they are published they cannot be updated or amended while progress and development of science and technology require naming of new concepts as well as agreement on the terms to be employed. The solution to the problems mentioned can be found in the developing an e-version of the glossaries.

We chose Google Site as a software solution for developing an e-glossary of FLC teaching terms. The choice was conditioned by the features and options of Google Sites (2017) which, in our opinion, meet the requirements for the software platform for e-glossary: simple creation and editing, possibility of easy co-editing and sharing, immediate and easy access to the content from different devices (a computer, a tablet, and a mobile), security of storage.

Results

Bilingual e-glossary of FLC teaching terms was developed in order to provide those involved into intercultural communication in foreign languages and cultures teaching field with a reliable and secure database of subject-field terminology in English and Ukrainian with easy access from any device. It also is considered to be a centralized collaboration venue for the foreign languages and cultures teaching field experts.

English-Ukrainian e-glossary includes 400 and Ukrainian-English glossary contains 354 subject-field terms denoting main concepts of methodology, pedagogy, linguistics, theory and practice of translation, ICT, abbreviations. The terms are arranged alphabetically and are given in the form of entries. Each entry offers key terms in bold and their related concepts. All terms are provided with their equivalents in the target language. In the case of abbreviations, these are given in brackets after the full form (Eg.: Content and Language Integrated Learning (CLIL) – урахування міжпредметних зв'язків). This does not apply to abbreviations that are listed in the e-glossary as independent entries (Eg.: ECTS (European Credit Transfer and Accumulation System) – заліковий кредит).The

alphabetical index with cross-references to the entries of the glossary makes using the e-glossary more efficient.

The main advantage of e-glossary of FLC teaching terms over other tools such as Google Translate for instance, is that it conveys all special meanings including abbreviations accurately and naturally (Eg.: *формування компетентності – forming competence* (Google Translate) vs *competence development* (e-Glossary of FLC teaching terms); *CALL – Call* (Google Translate) vs *навчання іноземної мови за допомогою комп'ютера* (e-Glossary of FLC teaching terms).

Providing accurate and consistent subject-field terminology in both English and Ukrainian, e-glossary is attended to assist student teachers, advanced students and other experts in FLC teaching to confidently use profession specific terminology while participating in professional intercultural communication. Further benefits of using it include time-saving, reducing confusion and avoiding mixing of terms and concepts, the possibility of collaboration while doing a team project on standardizing of terms when there can be several editors working simultaneously on different entries.

Conclusion

In recent years Ukrainian scholars working in the field of FLC teaching have realized that intercultural professional communication is no longer an option, but a necessity. The importance of efficient communication with colleagues all over the world for everyday work and professional development is difficult to overestimate as the global nature of modern issues related to encouraging excellence and innovation in language teaching, helping people learn languages more efficiently calls for cooperation between nations.

The questions whether communication between people belonging to different cultures is efficient and whether all parties emerge with the same understanding are of crucial importance. To reach mutual understanding, avoid confusing and amusing mistakes it is necessary to use consistent terminology properly.

The aim of the developing of the bilingual e-glossary of FLC teaching terms is to register key subject-field terms in English and Ukrainian employed in this occupational domain in order to create a reliable, easy-to-update database with easy access to it from any device. Further research in this field would be of great help in improving the content of the e-glossary of FLC teaching terms by adding an option of a style guide to academic and scientific writing.

References

Ahmad J. 2012, Stylistic Features of Scientific English: A Study of Scientific Research Articles, http://www.ccsenet.org/journal/index.php/ells/article/download/15229/10298, accessed on 9th May 2017.

Amelina, S. M., 2013. "Features of forming specialized glossaries", Filolohichni studii, Naukovyi Visnyk of Kryvyi Rih State Pedagogical University, 9, pp. 650–654.

Cabré-Castellvi, M.T., 2003. “Theories of Terminology. Their description, prescription and explanation”, Terminology, John Benjamins Publishing Company, 9(2), pp.163–199.

Fabrychna, Ya., 2013. “Linguistic and Stylistic Features of English and Ukrainian Texts on Foreign Languages and Cultures Teaching”, Visnyk of Kyiv National Linguistic University, Series “Pedagogy and Psychology”, 22, pp. 54–62.

Fabrychna, Ya. G., 2015. “English-Ukrainian Glossary of Foreign Languages and Cultures Teaching Terms”, Inozemni Movy [Foreign languages], Kyiv National Linguistic University, 4, pp. 54–60.

Fabrychna, Ya. G., 2016. “Ukrainian-English Glossary of Foreign Languages and Cultures Teaching Terms”, Inozemni Movy [Foreign languages], Kyiv National Linguistic University, 1, pp. 54–60.

Felber, H., 1983. “Basic Principles and Methods for the Preparation of Terminology Standards”, in: C. G. Interrante and F. J. Heyman (Eds.), Standardization of Technical Terminology: Principles and Practices, ASTM STP 806, American Society for testing and Materials, Philadelphia, pp. 3–14.

Glossary ECML Programme 2008–2011. “Empowering Language professionals”, European Centre for Modern Languages (ECML), 2012–2013.

Glossary of Foreign Languages & Cultures Teaching Terms, https://sites.google.com/view/eglossary-of-flct-terms, accessed on 10th May 2017.

Glossary of Instructional Strategies, http://www.beesburg.com/edtools/glossary.html, accessed on 10th May 2017

Google, 2017. Google sites, https://gsuite.google.com/intl/en_ie/products/sites/, accessed on 10th May 2017.

Google Translate, https://translate.google.com.ua/#uk/en/формування%20компетентності, accessed on 10th May 2017.

Google Translate, https://translate.google.com.ua/#en/uk/CALL, accessed on 10th May 2017.

Glossary on the Bologna Process, http://bologna.owwz.de/home.html?&L=2, accessed on 10th May 2017.

Karaban, V. I., 2003. Translation from Ukrainian into English, Nova Knyha Publishers.

Korunets’, I. V., 2003. Theory and Practice of Translation, Nova Knyha Publishers-

Kyyak, T. R., 2007. “The functions and translation of terms in professional languages”, http://eprints.zu.edu.ua/1545/1/84.pdf, accessed on 10th May 2017.

Kolesnikova, I. L., Dolgina, O. A., 2001. A Handbook of English-Russian Terminology for Language Teaching, Cambridge University Press, Russian Baltic Information Centre BLITZ, St. Petersburg-

Nikolaieva, S. Yu., Bihych, O. B., Borysko, N. F., Borets'ka, H. E., 2013. Metodyka navchannia inozemnykh mov i kul'tur: teoriia i praktyka: pidruchnyk dlia stud. klasychnykh, pedahohichnykh i linhvistychnykh universytetiv.

Pasichnik, T. D., 2011. Methodology of teaching bilateral translation of commercial letters to student philologists, thesis for a Candidate Degree in Pedagogical Studies.

Semenoh, O. M, 2010. “Kul'tura naukovoi ukrains'koi movy”, Akademiia .

Teaching knowledge database, http://www.teachingenglish.org.uk/knowledge-database, accessed on 10th May 2017.

Shunevych, B., 2000. “Pro uporiadkuvannia novykh terminosystem”, Visnyk DU «L'vivs'ka politekhnika» «Problemy ukrains'koi terminolohii» : materialy 6-i Mizhnarodnoi naukovoi konferentsii [«SlovoSvit 2000»], № 402, pp.85–87.

Wüster, E., 2004. “The structure of the linguistic world of concepts and its representation in dictionaries”, Terminology, John Benjamins Publishing Company, 10(2), pp. 281–306.

Yutskevych, O. P., 2002. Problemy vykladannia profesijno oriientovanoi inozemnoi movy, in: Zbirnyk naukovykh prats' vykladachiv kafedry inozemnykh mov ta ukrains'koi movy ta literatury, Kyiv National economic University, pp. 150–153.

GAME-BASED LEARNING IN ENGLISH FOR SPECIFIC PURPOSES CLASSROOM

IRYNA DIDENKO

Faculty of Economics
Taras Shevchenko National University of Kyiv, Ukraine

e-mail of corresponding author: ir-za@i.ua

Key words: Educational games, Gamification, Intrinsic motivation, Real-world tasks, English for Specific Purposes

Abstract: The British Council 'English for Universities' project launched in 2013 in Ukraine initiated the process of reconsideration of English for Specific Purposes standards in Ukrainian universities. Intrinsic motivation of the students was recognised as one of the most important factors for achieving success in English for Specific Purposes acquisition. The increasing of motivation of the first and second year students majoring in Economics through educational games and gamification while acquiring English for Specific Purposes is considered in the article. The advantages and disadvantages of different types of games in English for Specific Purposes context are analysed. Moreover, the ways of adjusting the General English educational games to English for Specific Purposes classroom are demonstrated. Furthermore, the results of the experiment that was undertaken in September 2015 and finished in January 2017 are described in the article. Two groups of students of the faculty of Economics who initially had the same level of English were involved in the experiment, where one group was acquiring English for Specific Purposes through games and tech tools, and the other one, the control group, was taught in traditional way. The timescale was determined by the curriculum, according to which the students are learning English for Specific Purposes for a year and a half, that gave an opportunity to measure the final results of both groups. According to the final results the first group has got 42% of 'excellent', 33% of 'good' and 25% of 'satisfactory' marks, and the control group has got 17% , 50% and 33% correspondingly. Moreover, the survey has shown that the students from the first group were more motivated and spent less efforts for exam preparation than the students from the cotrol group. The data of the research can be applied in English for Specific Purposes classrooms for achieving better results.

Introduction

The new era of Information Technology development and availability of higher education has led to the increased competition on the world labour market. Today's graduates face stiff rivalry while applying for a job. Therefore, the standards of the university education have to be reconsidered in terms of preparation competent specialists, who, at the same time, can be extremely competitive on a job market. For this purpose, indeed, the British Council together with leading Universities of Ukraine in 2013 launched a ground-breaking project – "English for Universities" (British Council 2017). The main aim of the project is to make a crucial shift in the level of English amongst students and university teachers, where the latter are considered as a facilitating tool for the transformation of their students' level. Consequently, since 2015 more than 700 ESP teachers, heads of ESP departments and subject teachers, who use English as a medium of instructions have been prepared during British Council Teacher Development Summer and Winter schools (British Council 2017). Moreover, these transformational changes in the approach of English teaching in Ukrainian universities have got the ‚snowball effect', because the participants of the Summer and Winter schools are required not only to implement changes in their own teaching practice, but to share the ideas with their colleagues through the dissemination sessions in their universities.

However, the holy grail of changing the standards of tertiary education in Ukraine in terms of enabling university graduates to be competitive on the international stage has faced real challenges, and one of them is the substantial decrease in the amount of hours allocated for English for Specific Purposes course. It should be admitted that if, for instance, a decade ago students majoring in International Economics had 748 hours of English for Specific Purposes course, that lasted five years and a half, nowadays, the course

has been shrinked up to 238 hours and a year and a half corresponingly. Under such conditions of, on the one hand, triple reduction of hours allocated for the course and, on the other hand, increased requirements to the standards of tertiary education, the students‘ intrinsic motivation attains extremely significant value. Because an effective combination of intrinsic and extrinsic motivation can lead to higher productivity and quality of language acquisition compared to relying upon the extrinsic motivation only.

Intrinsic motivation according to Dr. Richard Ryan and Edward Deci is defined as “the doing of an activity for its inherent satisfactions rather than for some separable consequence. When intrinsically motivated a person is moved to act for the fun or challenge entailed rather than because of external prods, pressures, or rewards” (Ryan and Deci 2000, 56). Mia MacMeekin gives 27 ways of promoting intrinsic motivation, where tip#12 is ‚Play a game‘ (MacMeekin 2014). But, to our opinion, a game, as the way of enhancing the intrinsic motivation combines several other ways suggested by Mia MacMeekin: teamwork, increasing curiosity, abolishing grades and extrinsic rewards, challenging issues, energizing, creative atmosphere and self-measurement (Mac Meekin 2014), that is why this research was focused on the game as a tool for increasing the intrinsic motivation of students.

However, we were researching the ways of increasing intrinsic motivation in tertiary context. And the question, that was arisen, whether educational games and gamification, that is implementation of “game-design elements and game principles in non-game contexts” (Huotari and Hamari 2012, 19), are applicable to the English for Specific Purposes classroom. Furthermore, the practicability of using tech tools and mobile applications for English for Specific Purposes competences acquisition was researched. And, finally, the ways of adjusting the General English educational games to English for Specific Purposes were analysed. The results of the experiment can show the rationale for using games in specific and academic environment.

Methods

The main method used for this research – was the straightforward experiment, where two groups, each consisting of 12 students of the same initial level, were involved. One group was acquiring English for Specific Purposes through games and tech tools, and the other one, the control group, was taught in traditional way. The experiment was undertaken in September 2015 and lasted until January 2017. The timescale was determined by the Syllabus, according to which the students are learning English for Specific Purposes for a year and a half. So the given time framework gave an opportunity to measure the final results of both groups and summarise them through statistical methods.

One more method used was questionnaires - preliminary, interim and closing feedback forms, where the students of the group under experiment were stating their feelings and views on their motivation before, during and at the end of the experiment, analysing their achievements, how they have changed, and

whether it became more difficult or easy for them to acquire the language. For the same purpose some face-to-face interviews were organised.

Finally, all the data were gethered, analysed, generalised and the conclusions were made.

Results

With the experimental group we have tried different types of games on two purposes: to try whether all educational games used in General English (GE) classroom can work in English for Specific Purposes (ESP) classroom and to find out how GE games can be adapted to ESP context.

The types of games that we have used are as follows:

- Card games
- Board games
- Video games
- Simulations

Here are some card games that have shown good results in motivating students and led to good results in understanding and memorising difficult concepts and lexis.

Memory game with matching business collocations, synonyms and antonyms to some specific vocabulary, word combinations and their definitions worked well, because students were not forced by the teacher to learn those collocations or definitions, but they did that themselves, in order not to lose their face or because of their natural desire to win. Moreover, it was not very time-consuming for the teacher to prepare the game, despite the fact of not finding the ready-made cards in the Net.

Role play cards were good, because when the roles are nominated, even shy students can try their hand in leading a meeting or negotiations, etc.

Flash cards and *Card Dominoes* were used for drilling and memorising, but they did not imply creativity from students and did not increase their intrinsic motivation, that is why we used them not much.

Hang man – was good for revising chunks of lexis, at the end of the semester or at the beginning of the next one.

Guess the Word. The game worked great, when it was organised in a form of competition between two teams with a time limit of 1 minute, during which students in turn were expected to explain as many words and word combinations as they could. Team spirit really motivated students to learn the topic vocabulary even without teacher's pressure.

Taboo game experienced to be pretty challenging and motivating even for the students of B2 level, because it was a kind of a word quessing game complicated with the list of 3-4 key words a student cannot

use while explaining the term. The best form of organising the game was spliting students in to several teams of four, the student, who guessed the term, took the card, at the end those, who got the biggest amount of cards – won. This game is really worth efforts spent on creating the cards by the teacher, in spite of being very time-consuming. As an example you can find a set of General Business English ready-made cards, if follow the corresponding link in References (Business English Taboo Cards 2017).

With board games the significant difficulty was in complete lack of available ready-made board games targeted at ESP course. Furthermore, it was very time- and effort-consuming to create at least one, compared to card games. However, we have created several board games for our ESP class: Allias and a Problem-Solving game. But we came to conclusion, that in ESP context board games are not relevant, because of the discrepancy of the efforts spent and results obtained. Allias could be easily substituted with Guess the Word card game, and a Problem-Solving game with a sort of simulation game.

But video games (especially computer and mobile phone applications and platforms) appeared to be a real trouvaille due to the high extent of the computer-consciousness of current students, who are representatives of Generation Y. The intrinsic motivation of nowadays tech-savvy students skyrocketted when we introduced computer-based learning, allowed them to use their mobile phones during the lesson for educational purposes, implemented using of mobile applications, etc.

One more advantage of using such type of games is their great variety and choice, as a result, you can find something that really suits your ESP class requirements or easily create tasks and games yourself, using the existent platforms, such as:

KAHOOT - https://create.kahoot.it/login

SOCRATIVE - https://www.socrative.com

PUZZLEMAKER – http://www.discoveryeducation.com/free-puzzlemaker/

QR GENERATOR - http://www.qrstuff.com

LANTERNFISH - http://bogglesworldesl.com

COURSERA - https://www.coursera.org

And this is not the complete list of resources that we tried with our experimental group and got the outstanding results and positive feedbacks. The only drawback that can occur is lack or poor Internet connection.

We in ESP context with the experimental group have practiced simulations a lot, mainly due to the nature of simulation, that is very close to the real-world task that, in its turn, is considered to be the basic method of teaching in ESP context. We used three types of games, described before, as a pre-task, with the help of which we not only increased students‘ motivation, but created conditions for their painless

acquisition of all the necessary knowledge and skills and preparation for the task performing. And simulation was the final stage, where the students could implement the obtained competences. For instance, the students were asked to create and deliver a presentation of an advertising campaign, and when two teams were presenting their campaigns, the rest of the students were assessing them, using a checklist with criteria for evaluating both: the concept of the campaign and the way of presentation delivery. That kind of competition led to increased responsibility of the students, to their desire of learning the required functional language, specific lexis, body language, presentation structure, etc. And the teacher was the last person, who had to remind them, what they were expected to do, they did everything themselves. The teacher only facilitated the process while the students were studying without any coercion.

As a result of the experiment, after a year and a half the final results of the experimental group were as follows: 42 % of 'excellent', 33 % of 'good' and 25 % of 'satisfactory' marks, while the control group has got 17 %, 50 % and 33 % correspondingly. According to the formal results the overall academic performance of the first group was improved, moreover, the survey has shown that the students from the first group felt more motivated and spent less efforts for exam preparation than the students from the control group.

Conclusion

The experiment has proved the relevance of game-based learning to the ESP context. In spite of some disadvantages of some games and even some types of games, games are worth being introduced in teaching ESP, due to their decreasing TTT (teacher talking time), encouraging creative thinking of students, finding new ways of teaching and reinforcing material, building rapport with students, collaboration among students and enhancing students' intrinsic motivation, the latter could be considered as the most crucial reason for introducing games in terms of time pressure, when the time allocated for the ESP course was dramatically decreased. Moreover, using tech tools and mobile applications for educational purposes contributed even more to the students' intrinsic motivation due to tech-consciousness of nowadays youth. The research was based on hands-on experience with the real group that helped to reveal the drawbacks of some games and to find out the ways of adjusting the General English games to the English for Specific Purposes context. All in all, introducing the gamification approach to the ESP teaching could contribute to the achieving the ultimate goal of transformational change in Ukrainian tertiary education in order to enable University graduates to meet international standards and be highly competitive on the world job market.

References

British Council, 2017. "The English for Universities." British Council Ukraine. http://www.britishcouncil.org.ua/en/year-of-english/projects/english-universities, accessed on 11th March 2017.

Business English Taboo Cards, 2017. “Business English FREE RESOURCES AND MORE...” http://www.businessenglishresources.com/business-english-taboo/, accessed on 5 May 2017.

Ryan, R.M., Dr., and Deci, E.L., 2000. “Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions.” Contemporary Educational Psychology, Vol. 25. Pp. 54-67. http://www.unco.edu/cebs/psychology/kevinpugh/motivation_project/resources/ryan_deci00.pdf, accessed on 13th May 2017.

MacMeekin, M., 2014. “27 Ways To Promote Intrinsic Motivation In The Classroom.” Teachthought: We grow teachers. Blog. http://www.teachthought.com/pedagogy/student-engagement/27-ways-promote-intrinsic-motivation-classroom/, accessed on 11th May 2017.

Huotari, K., Hamari, J., 2012. „Defining Gamification - A Service Marketing Perspective“. Proceedings of the 16th International Academic MindTrek Conference 2012, Tampere, Finland, October 3-5, pp. 17-22. http://www.rolandhubscher.org/courses/hf765/readings/p17-huotari.pdf, accessed on 14th April 2017.

INTEGRATION OF COMPUTER-MEDIATED COMMUNICATION INTO ENGLISH FOR SPECIFIC PURPOSES TEACHING AND LEARNING: PRACTICAL ASPECT

YANA DIACHKOVA

Faculty of Economics
Taras Shevchenko National University of Kyiv, Ukraine

e-mail of corresponding author: yanadyachkova@yandex.ru

Key words: Computer-Mediated Communication (CMC); English for Specific Purposes (ESP); Computer-Assisted Language Learning (CALL); ESP Learners, Pilot Training.

Abstract: Since the introduction of electronic media in general and the Internet in particular, more and more people have been using the Internet to communicate as a quick and reliable means of information transfer. Alongside the ever-increasing interest in electronic media, the Internet has been gaining ground to fulfil a variety of purposes not only as an intra- and inter-personal communication medium but also as a pedagogical tool facilitating language learning and teaching. The article begins by outlining the benefits and challenges of using CMC tools for language teaching in general based on analysis and synthesis of academic researchers in the sphere. It describes some sample activities that the author has used. The Internet is considered in the paper both as an intra- and inter-personal communication medium and as a pedagogical tool being used in a communicative language classroom. Computer-mediated communication integrated into ESP learning is shown to increase exposure and use of the target language. Online tools are positioned to play key roles in the implementation of CMC and greatly improve both ESP teaching and learning. And the aim of the given paper is to examine how context is configured in ESP learners' language learning practices through CMC; to provide an overview on CMC, its modes, and impact on language education and communicative competence development. That is why it is of a crucial importance to define the impact of CMC on learning process and on quality of higher education in general. In order to find out the efficiency of CMC in educational process, the pilot training was held, the outcomes of which are depicted in the article. As a result, the implementation of CMC tools proved its paramount efficiency and flexibility for both teaching and learning.

Introduction

The Internet is considered to be a quick and reliable means of information transfer in all spheres of social interaction, including educational environment. In the sphere of education the Internet fulfils a variety of purposes not only as an intra- and inter-personal communication medium but also as a pedagogical and methodological tool facilitating language learning and teaching. Particularly the last function (the pedagogical and methodological one) is the subject of this research.

It goes without saying that among the challenges many language teachers face in facilitating the improvement of speaking skills are sparing sufficient time for practice to enable students to achieve fluency in speaking through internalizing the structures, and establishing a balance between fluency and accuracy. With the development of contemporary language tools this problem gets a solution.

There are a large number of online tools that can be used for foreign language learning and teaching. The increasing awareness of the tools generates a need for computer-assisted language learning (CALL) researchers and practitioners to develop and implement CALL widely by exploring, selecting, using and evaluating the tools in a variety of contexts.

Internet-based language instruction can be defined as language teaching conducted on the Internet using Internet tools and resources. In Internet-based language instruction, computer-mediated communication (CMC) and Web-based language learning (WBLL) are two major topics, which have particularly attracted

great attention among CALL researchers and practitioners (Abrams 2003; Koory 2003; McDonald 2002; Wang 2004 and others). The development of appropriate applications (apps) alongside the widespread use of the instructional Internet resources has turned CMC into a very important communication media which has been used wildly and effectively to cover a variety of purposes including interpersonal communication, information transfer, professional development, pedagogical ends, etc. The integration of technology into educational environments can be expected to have a myriad of positive effects on both language learning and teaching. It has already been proved by a great number of researches that Internet-based communication has a significant motivational effect on the students resulting in the improvement of their communicative skills. Technology-based language learning has revolutionized the world of education and made it possible to transcend boundaries of classroom walls and to learn in new ways. Therefore, there is a need to further explore the advantages and potentials that this media has to offer and the benefits of up-to-date apps for communicative competence in speaking development.

This article aims to examine how context is configured in ESP learners' language learning practices through CMC; to provide an overview on CMC, its modes, and impact on language education and communicative competence in speaking development; to investigate the effectiveness of the introduction of online spoken exercises (as a teaching tool to be used in flexible delivery) requiring impersonal spoken product to develop learners' communicative competence in speaking.

Computer mediated communication in language education

To begin with, it is necessary to point out that research studies of CMC use in language education have addressed overall aspects of context in language learning and teaching, including technologies, linguistic features, pedagogy, curriculum, social materials, and social discourses on CMC. These layers of context show that the occurrence of social interactions in ESP language learning needs to be understood in relation not only to immediate professional situational contexts, but also to the broad cultural and social contexts shaping immediate situations. The conceptual complexity of context in language education can be captured by a definition that considers context as a relationship between a focal event and the field of action within which that event is embedded (Duranti 1992). As such, the conceptual complexity of context has been concerned with micro and macro dimensions of context since the beginning of CMC use in language learning and teaching practices.

ESP learners' construction of their learning context is based on the affordances they make regarding learning activities that are intertwined with language socialization. Configuring affordances is a culturally and socially grounded meaning making process, which leads learners to explicitly and implicitly learn uses of language that are aligned with the norms, professional values, beliefs, and hierarchies of a group of

professionals in the sphere through interactions with people who have expertise in or mastery of the discourses. While constructing affordances for language learning tasks in socialization practices, language learners configure contextual elements dialogically, reflecting and appropriating social voices in meaning-making processes that draw on semiotic tools (Bakhtin 1981). The practice of configuring affordances is a social practice in which the perspectives of self and other are exchanged in the roles that learners take on as private, public, and social selves. Through this kind of social practice, ESP language learners identify themselves as prospective representatives of a profession while simultaneously performing as individuals. They also implement their experience from professional courses into speaking practice, applying the knowledge into corresponding skills development.

The way language learners configure contexts occurs in joint construction among their communication partners. Joint construction occurs within group dynamics reflective of participants' subject positions in their learning contexts. In jointly constructing learning contexts, not every learner participating in a CMC activity is engaged in the same process of configuring contextual elements in the learning environment, in that each learner's ways of interacting with the environment involve social and cultural practices that are developed in their own discourse communities. It allows communication partners with different language levels to interact efficiently. Thus, the different affordances that each person obtains from the dynamic interplay of the cultural, environmental, historical, perceptual, and social dimensions of their learning processes, lead to the emergence of various levels of goal achievement. The concept of affordances (van Lier 2000, 2002) is connected to the notion that context is fluid and explains how learners as social agents configure contextual elements and construct the context of learning. It also makes the context become a methodological tool for language teaching.

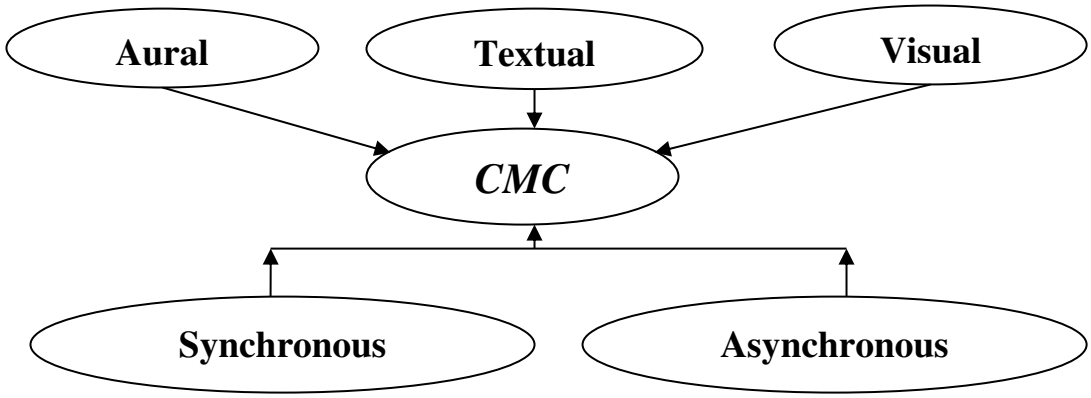
Expanding conceptions of context for CMC activities as language socialization practices entails an understanding of ESP language learners' complex professional responsibilities, a complexity that comes from multiple social roles, providing the participants with different affordances for their CMC activities. It is also necessary to point out that the configured context co-constructed by language learners fully captures the complexity of CMC practices, since the context for any learning activity is an interconnected relationship among contextual elements of the learning environment that learners configure for learning tasks. When language educators use CMC tools in various professional settings in groups where the participants are less homogeneous in terms of their subject knowledge and social roles, they need to examine language acquisition and language socialization as inextricably intertwined entities. Only after that a language educator can apply the jointly constructing learning contexts into the language practice as soon as this practice aims at developing ESP learners' communicative competence in speaking.

As it was researched, the integration of CMC into ESP learning can increase both exposure and use of the target language – two components that ESP learners possess. These components are needed for learners to promote both their linguistic and communicative competence. With CMC learning a language becomes a 24 hour process. By engaging in authentic social interactions using CMC and applying accurately configured context, ESP learners are exposed to the target language and are able to practice what they have learned in the classroom.

CMC environments are thus a logical place to explore both to determine which key characteristics of face-to-face interaction they share, especially for situations where the latter is impossible (such as online learning) and to see whether there are additional elements they bring in that improve the learning experience for certain types of learners.

CMC is divided along two main dimensions: time – synchronous and asynchronous – and modality – text, audio and video (Figure 1). Synchronous, or real-time, CMC includes chat, instant messaging and MOOs (multi-user domain, object oriented) in the text mode and most commonly VOIP (Voice Over Internet Protocol) in the audio mode. Asynchronous CMC, where there is a delay between sending and reading/responding, includes email, bulletin or discussion boards and voice boards in the audio mode. There are also a number of newer formats such as blogs allowing posted comments and SMS text messaging on mobile phones. To date, the overwhelming majority of CMC studies have been limited to text, though this is likely to change as online audio and video communication become more commonplace. That is the key priority of this paper.

FIGURE 1: MODES OF CMC



Source: Abrams 2003

It goes without saying that there were scientific approaches to the comparison of the effectiveness of all modes of CMC. Abrams compared the effects of synchronous and asynchronous text-based communication on the quality and quantity of language produced and did not find significant differences

between the two modes (Abrams 2003). However, in some instructional contexts, student learning outcomes are reportedly superior in asynchronous online discussion rather than face-to-face discussion (Koory 2003; Wang 2004). In this regard, synchronous chat, with attempts to emulate face-to-face discussion, is often viewed as inferior to asynchronous online communicative exchange (McDoland 2002).

It allows us to come to the conclusion that the preference to this or that mode of CMC can be given depending on the personal characteristics of ESP learners, their level of communicative competence development, teaching and learning materials, topic, aims of a class etc. To develop learners' communicative competence in speaking we suggest using asynchronous CMC to improve motivation of ESP learners and to make their oral performance easier thanks to the elimination of face-to-face emulation during the interaction with both the teacher and the audience.

It is evident that online tools play key roles in the implementation of CMC and WBLL. Classtime is often not enough to engage language learners in the individual spoken practice they need. Many learners study a foreign language for years without developing the speaking skills to communicate abroad. It automatically means that it is crucially important to implement online tools providing learners with online spoken exercises and activities in order to develop their communicative competence in speaking so that these activities require impersonally recorded spoken products.

Pilot training

Supplementing the curriculum with online spoken exercises offers ESP language learners a more intimate and effective channel to practice speaking. Not only will the learners spend more time speaking, they can be bolder and develop confidence in the privacy of their own home. By providing consistent feedback, a teacher can provide their ESP learners with intimate and ongoing critiques of their spoken performance.

To investigate the effectiveness of the introduction of online spoken exercises being used as a teaching tool in flexible delivery, a ***pilot training*** was held at the Faculty of Economics of Taras Shevchenko National University of Kyiv (Ukraine). The **participants** of the pilot training were 14 first-year ESP students of the major Finance and Crediting (with B2 level) and 12 first-year ESP students of the major International Economics (with B1 level). The **subject** of the pilot training was learners' communicative competence in speaking development by online spoken exercises. The students configured the context of learning choosing appropriate Internet resources, professional roles they were to perform, applicable professionally oriented information taking into account their background knowledge etc. The tasks were worked out using asynchronous CMC and the teacher's feedback was also given via e-mails and text messages.

During the pilot training we concentrated on ***descriptive and narrative*** speaking production skills. The tasks were given either online or via the applications (ExplainEverything, Voki), but the final product (spoken production) was presented online by the learners. In fact, online spoken exercises were used as a ***teaching tool*** in flexible delivery. In order to develop ESP learners' communicative competence in speaking, we practiced the next ***skills***:

- to issue the statement in accordance with the purpose of communication;
- to reveal the meaningful components of the message on the discourse level (topic, main idea, process changes, deviations etc.)
- to use the language clichés typical for the speech of a specialist in the sphere of economics;
- to clearly describe the process, state, situation etc; to explicitly express ideas;
- to summarize by comparing pros and cons, past and present, advantages and disadvantages etc.

The learners were suggested to use ExplainEverything application to develop descriptive speaking production skills. ExplainEverything is the most versatile interactive whiteboard app available for any device. It is an easy-to-use design, screencasting, and interactive whiteboard app with real-time collaboration that lets both educators and learners animate, record, annotate, collaborate, and explore ideas, knowledge and understanding. ExplainEverything provides teachers and language learners with an opportunity to reflect upon knowledge building, and assess both products and processes of learning. This app is extremely useful if the task is to describe a graph, table, pie-chat etc. as it does not require video recording; only voice recording and different manipulations with the picture are possible.

And they were proposed to use Voki to develop narrative speaking production skills. Voki is an application that lets the learners create personalized avatars to use on their wikis, blogs or websites. They can also e-mail these characters. This web 2.0 tool is a great way to motivate learners of any age, because they are very interactive and provide various options for students to customize them. It also improves the learners' speaking skills in an engaging and innovative way. The learners at the same time do not feel ashamed and confused as they use somebody's personality and voice, so it automatically decreases psychological pressure on a person.

I want to introduce the comparative analysis of preliminary evaluation of the ESP learners' communicative competence in speaking level of development (before the implementation of the apps) (Test 1) and evaluation (Test 2) of the competence level of development as a result of the pilot training (Table 1). The evaluation of the learners' progress was carried out according to the following *quality criteria*: task correspondence, revealing of the meaningful components of the message, speech coherence,

speech fluency, linguistic accuracy, usage of topical vocabulary, correspondence of communicative behaviour and usage of the cliché. *Quantitative criteria* were speaking pace and volume of uttering. In the total estimation of the ESP learners' communicative competence in speaking the part of each criterion was equal (10 points).

TABLE 1. THE RESULTS OF THE TESTING OF LEARNERS' COMPETENCE LEVEL OF DEVELOPMENT BEFORE AND AFTER THE PILOT TRAINING

Student No	***Test 1*** (max. 100 points)	***Test 2*** (max. 100 points)
S 1	78	89
S 2	65	87
S 3	77	90
S 4	79	93
S 5	80	97
S 6	69	75
S 7	77	84
S 8	89	94
S 9	86	89
S 10	92	97
S 11	76	91
S 12	83	96
S 13	86	94
S 14	88	96
S 15	54	72
S 16	63	74
S 17	56	68
S 18	58	69
S 19	43	60
S 20	60	71
S 21	41	62
S 22	58	76
S 23	59	68
S 24	66	78
S 25	60	79
S 26	71	77
The average score of the group	**69,8**	**81,8**
Increase in points		**12**

Source: Own

The results of the final test show significant increase in dynamics, confirming the effectiveness of the teaching tool. Consequently, the use of asynchronous online speaking exercises focused on impersonal spoken outcomes improves the ESP learners' communicative competence in speaking development as well as facilitates the teacher's techniques and methodology. It has to be highlighted that when ESP learners by themselves constructed the context of learning, they were not only more motivated to learn a language but also aware of the process of their communicative competence in speaking development. The context thus became a methodological tool for a language teaching.

Conclusion

Thus, from the pedagogical perspective all the benefits of implementation of online spoken exercises into the language teaching process, which have been mentioned above, were confirmed by the pilot training. From the methodological perspective this teaching tool (in flexible delivery) appeared to be highly effective. First of all, it is necessary to point out that the learners (while recording themselves) performed the task several times trying to improve the final product. This repetition was extremely beneficial for the development of the skills mentioned and the communicative competence in speaking as a whole. Secondly, the learners' awareness of the purpose of applying online spoken exercises to develop their communicative competence in speaking lead to their understanding the essence of learning and learned material in class. And finally, the learners' working with the online task (watching videos, listening to audio, reading texts) facilitated integration of different language skills in the process of communicative competence in speaking development. Thereby the configuration of the context through CMC, the introduction of on-line spoken exercises as a teaching tool to be used in flexible delivery and the providing of impersonal spoken product are highly effective for ESP learners' communicative competence in speaking development. The findings give the possibility to further research methodological aspects of both synchronous and asynchronous use of on-line exercises to develop a foreign language communicative competence.

References

Abrams, Z., 2003. “The effect of asynchronous and synchronous CMC on oral performance in German.” The Modern Language Journal, No. 87 (2), pp. 157–167.

Bakhtin, M.M., 1981. “Excerpts from discourse in the novel”, in: Holquist, M., (Ed.). The dialogic imagination: Four essays by M. M. Bakhtin. Austin, TX: University of Texas Press.

Duranti, A., 1992. “Rethinking Context: Language as an Interactive Phenomenon”. Cambridge University Press.

Koory, M.A., 2003. “Difference in learning outcomes for online and F2F versions of An Introduction to Shakespeare.” Journal of Asynchronous Learning Network, No 7, http://www.sloan-c.org/publications/jaln/v7n2/v7n2_koory.asp, accessed on 20th April 2017.

McDoland, J., 2002. “Is “as good as face-to-face” as good as it gets?” Journal of Asynchronous Learning Network, No 6, http://www.sloanc.org/publications/jaln/v6n2/v6n2_macdonald.asp, accessed on 17th April 2017.

van Lier, L., 2002. “Ecology and Semiotics of Language Learning: A Sociocultural Perspective.” Norwell, MA: Kluwer Academic Publishers.

van Lier, L., 2000. “From input to affordances: Social interactive learning from an ecological perspective”, in: Lantolf, J., (Ed.). Sociocultural theory and second language learning New York: Oxford University Press, pp. 133–153.

Wang, H.L., 2004. “Correlation analysis of student visibility and performance in online learning”. Journal of Asynchronous Learning Network, No 7, http://www.sloan-c.org/publications/jaln/v8n4/index.asp, accessed on 10th March 2017.

THE CHALLENGES OF MOBILE-APP-BASED FOREIGN LANGUAGE TEACHING AND LEARNING

LADISLAVA KNIHOVÁ

Faculty of Economic Studies
The University of Finance and Administration, Czech Republic

e-mail of corresponding author: kniha@educationonline.cz

Key words: Mobile applications, student engagement, mobile-app based instruction, peer-to-peer learning, gamification of learning.

Abstract: The objective of this paper is to identify, analyse and inform on the state-of-the-art mobile applications used predominantly for the purposes of foreign language teaching and learning. In order to keep us up-to-date with the latest educational tech tools, the author examines in particular those mobile applications which are suitable for seamless integration into lesson plans and simultaneously have the potential of enhancing the quality of instruction. Being fully absorbed by mobile app environment is a natural part of students' lifestyle and there is absolutely no reason why university teachers should not make use of this opportunity, engage students and increase their attention span while pursuing educational goals in gaining relevant competences in foreign languages or other subjects. Though it may seem quite challenging at first, as the entry level of knowledge and skills requires certain rudimentary IT competences, it is worth trying. Creating and sharing lesson plans with the integration of mobile apps can boost creativity and help teachers to gain self-confidence. The paper brings information on the portfolio of mobile apps suitable for teachers, on the mobile apps teachers can recommend to their students, and last but not least on the mobile apps enabling peer-to-peer and social learning with the integration of social media. Mobile apps with elements of gamification are also included. An online survey carried out among foreign language learners and teachers provides fresh data pertaining to the researched topic.

Introduction

The Internet of Things (IoT) in the epoch called Industry 4.0 links various physical objects to the Internet building on the concept of cyber-physical systems and giving us the insights and data never available before. As the digital economy is increasingly getting global and turning mobile, industrial and other types of mobile applications are becoming ever more important. Initial staring at IoT with admiration and in amazement didn't last long and now we can benefit from the advancement of new technologies in every sphere of human activity, including foreign language teaching with the use of mobile applications. Regarding foreign language competences, there are three major concerns now that are gaining in importance not only for foreign language teachers and students but also for the whole society. They are globalization, multinational working environment, and employability.

The objective of this paper to identify, analyse and inform on the state-of-the-art mobile applications developed predominantly for the purposes of foreign language teaching and learning. In order to keeping us up-to-date with the latest educational tech tools, the author examines in particular those mobile applications which are suitable for seamless integration into lesson plans and simultaneously have the potential of enhancing the quality of instruction. Nowadays, being fully absorbed by mobile app environment is a natural part of students' lifestyle and there is absolutely no reason why university teachers should not make use of this opportunity, engage students and increase their attention span while pursuing educational goals in gaining relevant competences in foreign languages or other subjects. Though it may seem quite challenging at first, due to the fact that the entry level of knowledge and skills requires certain rudimentary IT competences, it is worth trying. The paper brings information on the portfolio of (1) mobile

apps suitable for teachers (mainly Oxford dictionaries), (2)mobile apps teachers can confidently recommend to their students (apps specializing in general English and business English), and last but not least (3) mobile apps enabling peer-to-peer learning and social sharing, including those with elements of gamification. An online survey carried out among university students and teachers provides fresh data pertaining to the researched topic.

The literature review related to the topic is based mainly on monographies the selection of which gives a wider perspective on the researched subject. In his work *Understanding Digital Culture*, on the background of the social determination of technology, Vincent Miller identifies and clearly explicates the key elements of digital media, including immersive experiences and video games environment (Miller 2011). The current fascination by gamification and its implications for learning is elaborated in detail by Karl M. Kapp et al. in his monography *The Gamification of Learning and Instruction Fieldbook* with the subtitle *Ideas into Practice* (Kapp 2014). The changing context for learning and trends in learning technology are researched by Nigel Paine in his work *The Learning Challenge* (Paine 2014). The literature review would not be complete without a wider perspective of the situation in schools seen mainly through the role of creativity presented by Ken Robinson in his monography *Out of our minds* with the subtitle *Learning to be Creative* (Robinson 2011). Ken Robinson also teamed with Lou Aronica to write a compelling "manifesto for change" titled *Creative Schools* (Robinson, 2015). Dealing specifically with the dramatic change of our stereotypes due to the existence of mobile culture, Ted Schadler et al. contributes significantly to general understanding and implication of the mobile lifestyle we are experiencing today. The name of his monography is *The Mobile Mind Shift* (Schadler 2014). Though it focuses mainly on the situation in business environment, especially the chapter dealing with the transformation of technology into systems of engagement has a wider validity and reach. Last but not least, numerous practical examples of strategies how to implement new technologies into teaching, including the integration of mobile application into instruction, are clearly described and analysed in the monography by Vicky Duckworth and Steve Ingle *Enhancing learning through technology in lifelong learning: Fresh ideas, innovative strategies: 25 creative tools for using technology in your practice* (Duckworth 2013). Currently, their work represents important core ideas in the research field.

As for the state-of-the-art ideas pertaining to mobile applications in learning and teaching, the author works with numerous reliable online resources by renowned experts in the field. In order to name at least one expert on learning technologies with global online presence and importance, the name Bob Little should be mentioned. The author of the treatise continuously follows and examines the ideas shared by Bob Little, the author of *Perspectives on Learning Technologies*, both on his blog and in his newsletter for subscribers issued by The Company of Thoughts (ToT).As a constituent part of online resources,

educational sections of app stores have been continuously monitored by the author of this paper for a long time.

The topic of mobile applications' use in teaching and learning, especially in teaching and learning English and other foreign languages, is fresh new and it is still waiting to be elaborated in a comprehensive way. The literature review directly related to this theme revealed a significant gap in the existing literature.

Based on the findings, information, and data gained and curated thanks to the literature review, the validity of the author's own research will be established and also opportunities for new research will be suggested.

In order to reach the stipulated objectives of the treatise, the author has formulated the following hypotheses:

H1 Minimum 40 % of foreign language students uses mobile learning apps every day to enhance their learning.

H2 Majority of active users of mobile apps for learning languages considers mobile apps very helpful.

H3 The term *Internet of Things* has not been heard of by majority of people.

Significant data acquisition, its analysis and interpretation will serve as a contribution to other research projects aiming to solve the difficult tasks consisting in changing the stereotypes that are still observed both in learning and teaching a foreign language. The author is convinced that spreading information on high-quality mobile apps for learning English will inspire confidence of students and lecturers and, simultaneously, will help to solve important socio economic issues which every society faces on the verge of the epoch of Industry 4.0 and Internet of Things (IoT), namely in connection with communication enabled via new technologies which is becoming more diverse, multi-cultural, and global. The lack of foreign language competence is highly topical and any attempts to postpone its solution are highly risky,

The role of educators is crucial as they are expected to adequately prepare "future-ready" generations. Educators may be knowledgeable; however, their expertise consists not only in the particular subject matter but mainly in their ability to transfer it smoothly and efficiently to their students. This idea is reflected in the quotation *"Knowledge is power. Knowledge shared is power multiplied."* by Robert Noyce, American Head of State and businessman. (Noyce 2017)

The research methods

The research methods carefully selected by the author of this paper are based on the principle of transparency and appropriateness with respect to questions under investigation. On the background of literature review and the author's own experience, the conducted primary online survey is a key tool used to gain information on current typical behaviour patterns and preferences of foreign language learners and teachers. The questionnaire was designed in the online application SurveyMonkey which is preferred by

the author due to its numerous features making the process of designing, sharing and analysing the survey easy in a user-friendly environment. The proposed methodology relying mainly on the synthesis and evaluation of gained data and information suggests new possibilities for creative cooperation in both learning and teaching environments aiming for sustainable formal and informal education.

Research

In harmony with the structure of this paper, mobile learning applications used in learning foreign languages will be examined further. However, understanding the topic in a broader context is inevitable.

Observing the new trends, the author of this paper fully supports the UK learning technologist Bob Little and his views on educational technology (edtech) issues in the medium-term future. Among others, Bob Little puts forward the following predictions: *"Five predictions about the future of edtech:* 1 Edtech – *increasingly used by trainers/ teachers to support, not replace, their teaching - is set to grow dramatically. Moreover, it will provide personalized learning and support learning outcomes with evaluation tools that measure social emotional skills, not just "memorization".*

2 However, to facilitate this, education leaders need to recognize that the key to the effective use of edtech is effective trainer/teacher professional development.

3 Both technological developments and learners' requirements will see learning materials become increasingly personalized – to meet individuals' and their organizations' needs.

4 The use of virtual reality (VR) and augmented reality (AR) will increase learners' engagement with learning materials. Simulation-based tasks for practice and feedback as well as skill documenting have the possibility of giving realistic and useful information as well as authentic training for real-world problem-solving – especially given timing and resource constraints. So, increasingly, trainers/ teachers will use VR and AR - at the expense of the traditional lecture - to communicate their ideas.

5 The increasing use of edtech will not mean the eradication of professional trainers/ teachers. Rather it will further change their job role and required skill set – placing greater emphasis on their coaching, mentoring, curation type skills instead of their "instructional delivery skills".

At the current developmental stage, the focus on *'how we learn'(and, potentially, 'where we learn')*rather than *'what we learn'* brings us to the mobile lifestyle gradually adopted across generations. If our students prefer spending time in mobile environment, mobile learning opportunities are the best option to offer. Looking at the role of teachers, Ken Robinson believes that: *"If you are involved in education in any way, you have three options: you can make changes within the system, you can press for changes to the system, or you can take initiatives outside the system."* (Robinson 2015, xvii) It is the new technology which enabled this paradigm change and, as a result, social changes are determined to happen. Since they are

subject matter experts, educators should take the lead and be pro-active in creating high-quality mobile learning applications as an important learning tool.

Due to the existence of the immense number of apps, downloading a particular application might be a random decision, however, more likely it is influenced by app*'* ranking in app stores(ASO - App Store Optimization)[1], as well as by grading and recommendations. Also, other factors, especially those influencing our emotions, play their roles. With the scarcity of specialized journals or websites, or even a mobile application in Czech language focusing on reviews and information on learning applications[2], orientation for learners is not easy. Owing to the fact that the author of this paper specializes in teaching ESP[3], the following selection of applications is based predominantly on her own experience with mobile apps for English language learning/ teaching.

TABLE 1. MOBILE APPLICATIONS SPECIALIZING IN GENERAL ENGLISH

Mobile applications specializing in general English				
Name	**Characteristics**	iOS		Android
Phrase-a-day	365 illustrated phrases with sample sentences; three levels (easy/medium/hard); audio 'click and listen' feature; authentic intonation; 'Favourites' button'; gamification and social sharing (Facebook and Twitter) elements.	iPhone	iPad	
		✓	✓	✓
English Grammar in Use	The official English grammar by Raymond Murphy; intermediate level; Study Guide.	✓	✓	✓
Duolingo	User-friendly study environment, daily study load, social sharing, entry level test.	✓	✓	✓
English tenses – Exercises, Rules, Esl eGrammar	Diagnostic test 1 and 2, from basic tenses up to wish clauses and direct and indirect speech; grammar rules explained.	✓	✓	
Exam Vocabulary Builder with AccelaStudy®	Expands vocabulary for university entry exams or professional advancement. Repetition mode, quiz, test your progress.	✓	✓	
English Idioms & Phrases – Collection of Most Popular Idioms and Phrases	Offers browsing, searching and learning most popular idioms and phrases; easy to navigate, examples in sentences.	✓	✓	
Source: Own				

[1] ASO – search engine optimization within the environment of app stores; it is often understood as an analogy to SEO – search engine optimization.
[2]The Czech magazine *Applikace* issued quarterly by T-Mobile (both printed and an app) is an exception to this rule.
[3]ESP = English for Specific Purposes

TABLE 2. MOBILE APPLICATIONS SPECIALIZING IN BUSINESS ENGLISH

Mobile applications specializing in business English				
Name	**Characteristics**	**iOS**		**Android**
		iPhone	**iPad**	
Business English App by Business English Pod (BEP)	A comprehensive selection of business related topics from business skills 360, customer service, via finance and accounting, HR, up to IT and computer, management, marketing, negotiations, incl. downloadable video section with professional vocabulary focus with the help of animations.	✓	✓	✓
English for Meetings by Business English Pod	High quality business English lessons to help you get your English language skills in shape for your next meeting. Topics: from expressing opinions, showing agreement/disagreement, clarifying what was meant, up to teleconferencing. Easy to navigate user-friendly mobile app.	✓	✓	
English for Telephoning by Business English Pod	High quality business English lessons to help you get you English language skills before your next call. Topics: answering the phone, leaving a message, voicemail, making an appointment, dealing with angry callers, etc.	✓	✓	
English for Presentations by Business English Pod	Each unit includes a natural dialogue featuring useful English vocabulary, idioms, and phrases. Each unit has the transcript of the dialogue, practice activities, and progress quizzes. The app is simple to use. In-app purchase to unlock all the lessons.	✓	✓	
English Test Package / ESL/EFL Test	The test evaluates your knowledge of English and grades it (elementary, intermediate, and advanced). Modules include: English Grammar Tests, English Synonyms tests, Business English tests, English Idioms Tests, and English Errors Tests.	✓	✓	

Source: Own

TABLE 3. ENGLISH DICTIONARIES AS MOBILE APPLICATIONS

English dictionaries as mobile applications				
Name	**Characteristics**	**iOS**		**Android**
		iPhone	**iPad**	
Oxford Advanced Learner's Dictionary (OALD9)	Contains 185,000 words, phrases, and meanings – incl. 900 new words and meanings. Trustworthy resource. Clear explanation and example sentences from the authoritative Oxford English Corpus. Real voice Audio. Downloadable audio of sentences (116,000). Quick navigation and personalization of your favourite entries.	✓	✓	✓
Oxford Learner's Dictionary of Academic English	Focuses exclusively on academic English. It helps non-native speakers understand academic texts and improve their level of academic writing. Four subject areas: physical sciences, life sciences, social science, and humanities, British and American voices, the dictionary text is live with multitasking features. Includes 22,000 words, phrases, and meanings clearly explained with focus on their usage in academic writing.	✓	✓	✓
Concise Oxford English Dictionary &Thesaurus	This popular app merges two dictionaries: the Concise Oxford English Dictionary and Concise Oxford Thesaurus. Over 240,000 words, phrases and meanings.Over 300,000 synonyms and antonyms.50,000 audio pronunciations.'Favourites', 'Recent list', and 'Word of the day' features. Voice search (speak to enter your searches quicker).	✓	✓	✓

Source: Own

Nowadays, social sharing, interactivity, and engagement with elements of gamification represent features of learning applications that are sought-after and expected by learners. Karl M. Kapp reminds us that: *"Research shows, that the level of interactivity within a learning environment is what drives learning. The more the learner interacts with other learners, the content, and the instructor, the more likely it is that learning will actually occur."* (Kapp 2014, 21)

Based on her own experience, the author of this paper is fully convinced that - thanks to their design and novelty features - all of the a/m mobile applications enable seamless integration into the process of instruction and creative integration into lesson plans while adopting the method of BYOD.[1]Transforming learners from a static role of observers to a role of active and creative participants is a key to success. Developing creativity in students is critically important for the intellectual property sector (sometimes described as creative industries, i.e. advertising, architecture, arts, crafts, design, fashion, etc.). (Robinson, 2011, p. 43) Ken Robinsons observes: *"The creative industries are labour-intensive and need many different types of specialist skill. Television and film production for example, draws on a variety of specialist roles in performance, in script writing, in camera and sound operation, in lighting, make up,*

[1]BYOD = Bring Your Own Device

design, editing and post-production." (Robinson 2011, 43) The creative industries are also dynamically expanding into other countries. Thus, the role and importance of foreign language competence is ever growing. Therefore, high-quality and engaging learning content observing methodical principles and available in the form of mobile applications is critically needed. As knowledge of languages is just a 'boarding card' to global science, it is important to think about the end-users of learning apps, e.g. Czech(young) scientists who are becoming members of global research teams ever more frequently. The competence to communicate fluently in a foreign language directly influences their achievements in international teams, and, just on the contrary, the lack of communication competence, e.g. in English, is a serious obstacle.

Teachers in the role of creative designers of learning materials, including the design proposals for mobile applications, can significantly influence the level of engagement of foreign language learners. High level of learners'engagement is a guarantee of students' active approach. Consequently, the retention of learning content is higher and learning really occurs. Creating and sharing lesson plans with the integration of mobile applications can boost creativity and help teachers to gain self-confidence in their classes. Ingle and Duckworth suggest that mobile learning and mobile learning applications can be used for various educational purposes:

- organization and administration
- researching and information seeking
- collaborating and sharing
- inquiry and knowledge gathering
- application and interaction. (Ingle a Duckworth 2013, 93)

Simultaneously, we have to keep an eye on possible inequalities, often referred to as 'digital divides'. The original understanding of this term as the 'gap between those who do and those who do not have access to computers and the internet' (Dijk, 2000, p. 30-53) is to be extended to mobile devices, including wearables, and it should be enhanced further taking into account possible social implications: *„The Internet and the broader digital revolution are not inexorably determined by technology; they are shaped by how society elects to develop them. Reciprocally, our chosen way of development will shape us and our society, probably dramatically."* (McChesney 2013, 7)

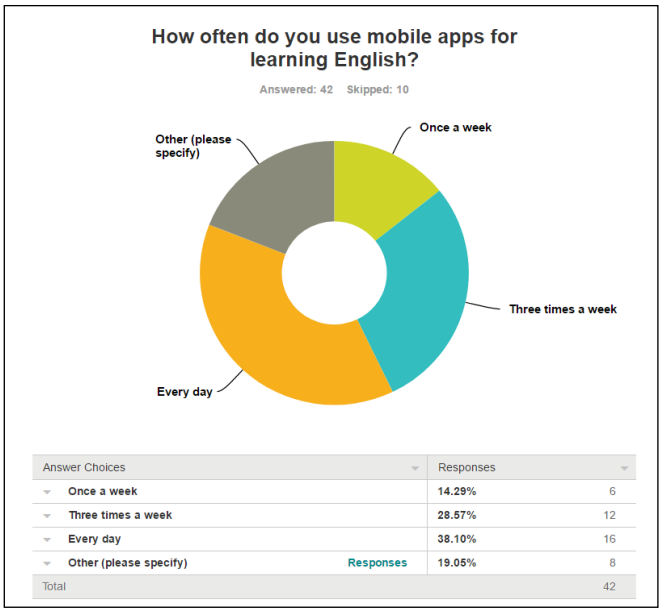
Massive popularity of mobile technologies, in particular smartphones, changes the game completely as, speaking about technological determinism and social change, Vincent Miller puts it: *"It is almost inevitable that any significant new technology will be predicted to transform society, or at least to embody the potential to transform society, for better or worse."* (Miller 2013, 7)

In this process, the role of educators is essential. However, they are not the only ones carrying the weight of responsibility for the future development in the years ahead of us on their shoulders. Ken Robinson comments on that: *„A high-performing education system is critical to national economic prosperity and to staying ahead of our competitors. Standards of academic achievement must be as high as possible, and schools must give priority to subjects and methods of teaching that promote these standards."* (Robinson 2014, 9)

Results

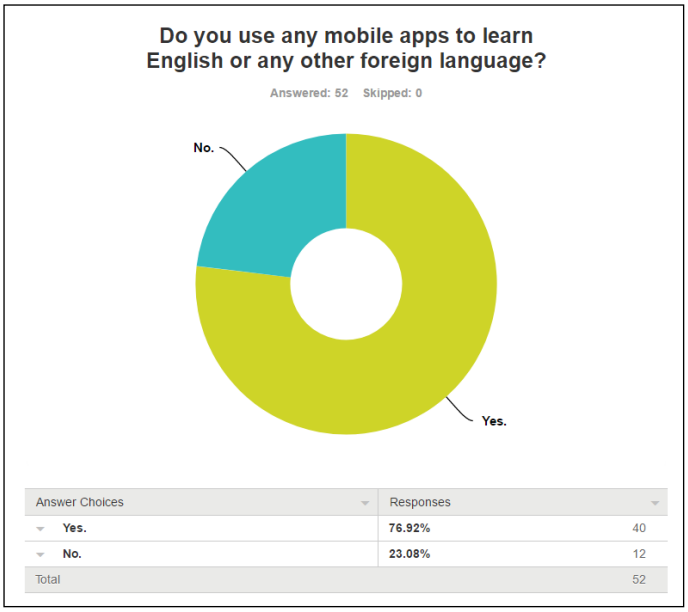
In order to achieve the stipulated objectives of this treatise, an empirical probe in the form of the author's own online survey was carried out. The target group represented foreign language learners and teachers aged between 18-64 in the Czech Republic and in the Slovak Republic. The questionnaire consisted of 6 multiple choice questions and 2 open questions. The period of data collection was from 18th till 23rdMay, 2017. The web link of the questionnaire was disseminated through the social media platform of Facebook. Multiple responses were not allowed. The questionnaire was anonymous. The Facebook posting with the questionnaire was promoted twice during the data collection period using Facebook advertising at the cost of 1,050 Czech Crowns. In total, the author received first-hand data with high level of reliability from 52 online respondents. A primary data ascertainment revealed interesting information. Respondents' answers to the following questions were selected in harmony with the needs of this treatise.

GRAPH 1 MOBILE APS FOR LEARNING ENGLISH



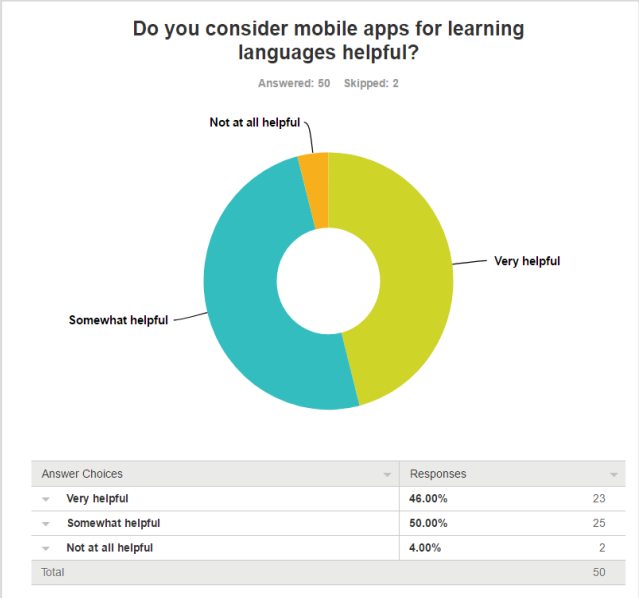
Answer Choices	Responses	
Once a week	14.29%	6
Three times a week	28.57%	12
Every day	38.10%	16
Other (please specify) Responses	19.05%	8
Total		42

GRAPH 2 HOW OFTEN DO YOU USE MOBILE APPS FOR ENGLISH OR ANY OTHER FOREIGN LANGUAGE?



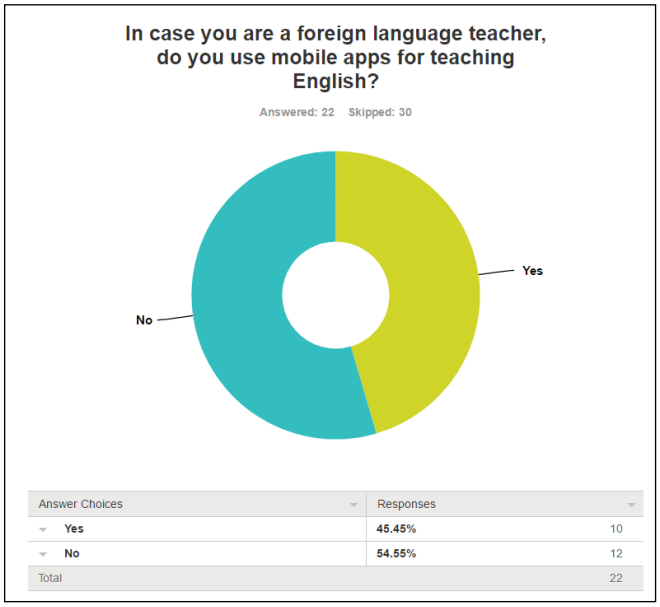
Answer Choices	Responses	
Yes.	76.92%	40
No.	23.08%	12
Total		52

GRAPH3 DO YOU CONSIDER MOBILE APPS FOR LEARNING LANGUAGES TEACHER, DO HELPFUL?



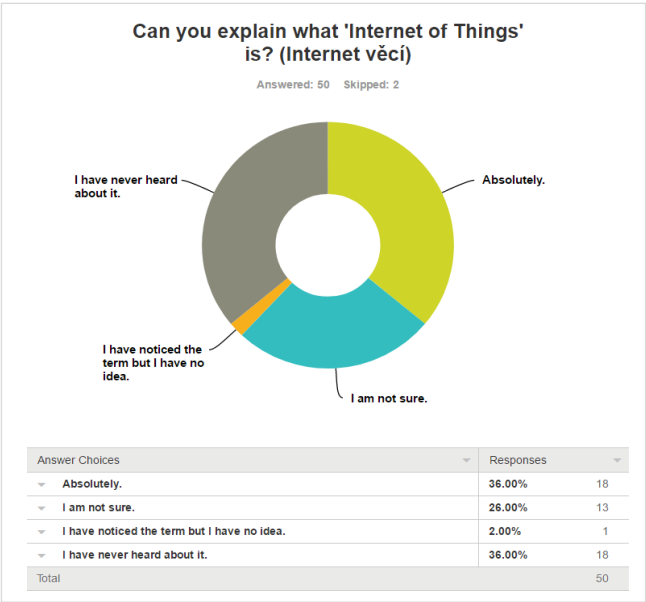
Answer Choices	Responses	
Very helpful	46.00%	23
Somewhat helpful	50.00%	25
Not at all helpful	4.00%	2
Total		50

GRAPH 4 IN CASE YOU ARE A FOREIGN LANGUAGE YOU USE MOBILE APPS FOR TEACHING ENGLISH?



Answer Choices	Responses	
Yes	45.45%	10
No	54.55%	12
Total		22

5 CAN YOU EXPLAIN WHAT 'INTERNET OF THINGS' IS?



Answer Choices	Responses	
Absolutely.	36.00%	18
I am not sure.	26.00%	13
I have noticed the term but I have no idea.	2.00%	1
I have never heard about it.	36.00%	18
Total		50

Author's commentary: It is a very promising finding that more than ¾ of respondents use mobile applications for language learning and almost 30 % of them use their mobile applications with the frequency of three times a week. Only 2% of respondents find mobile applications for language learning not at all helpful. This result tells us about the quality of these applications which is obviously meeting the needs and expectations of the respondents. About 45 % of foreign language teachers use mobile applications in their classes. Here, better access to information dealing with mobile applications suitable for foreign language teaching is absolutely necessary. Concerning the latest technological development, the research unveiled that 36 % of respondents are very well informed about the existence of Internet of Things and exactly the same number represents those who have never come across this term.

Based on these findings, we can test the hypotheses with the following results:

H1 Minimum 40 % of foreign language students uses mobile learning apps every day to enhance their learning.

= **This hypothesis was falsified.** However, the number of 38.10 almost reached the educated guess.

H2 Majority of active users of mobile apps for learning languages considers mobile apps helpful.

= **This hypothesis was falsified.** Only 46% of respondents agree to this statement.

H3 The term *Internet of Things* has not been heard of by majority of people.

= **This hypothesis was neither verified nor falsified.** Although it is a rare situation, exactly the same number of respondents can explain the term *Internet of Things* as those who have never heard of it. A lot more publicity is needed as the advances of technology in this area are fast and inevitable.

The objective of this paper was to identify, analyse and inform on the state-of-the-art mobile applications developed predominantly for the purposes of foreign language teaching and learning. Based on an extensive literature review, the author's own observations and the findings originating from the primary data, the author states that the objective of this paper was reached. The author is fully aware of the fact that the findings of the empirical probe included in this paper need to be verified by a subsequent quantitative research in order be more relevant and convincing. Simultaneously, comparative analyses with the aim to find out the situation in other countries would help to gain a more objective point of view on the implementation of mobile learning application into teaching and learning.

Conclusion

Transforming the way we teach and learn may be disputed by many due to the expected complexities of the process. However, to put it in Ken Robinson's words: "*We cannot meet the challenges of the 21st century with the educational ideologies of the nineteenth. [..] Transforming education is not easy but the price of failure is more than we can afford, while the benefits of success are more than we can imagine"*. (Robinson 2011, 283)

The author of this paper is fully convinced that the new forthcoming era of the Internet of Things and Industry 4.0 will dramatically change education since the needs of every industry will be totally different. Consequently, new technologies have the potential to modify educational technology and the way it helps us to learn. Mobile applications and mobile learning environment, enabling learning anywhere and anytime, will serve the needs of learners very well as these applications are designed with respect to the currently prevailing lifestyle. Simultaneously, engaging content and elements of gamification and social media sharing features will help knowledge and skills retention.

In her paper, the author identified and examined fourteen different mobile applications serving the needs of foreign language learners and teachers. At the same time, it was clearly proven that learners frequently use mobile applications in their informal learning.

Though we can hardly anticipate the future nowadays, important trends were identified on the course of elaborating this paper. These trends cannot be neglected; just on the contrary, further research projects should be carefully designed and adequately funded.

References

Duckworth, V., Ingle S., 2013. Enhancing learning through technology in lifelong learning: Fresh ideas, innovative strategies: 25 creative tools for using technology in your practice. Maidenhead: Open University Press.

Kapp, K. M., Blair l. a R. Mesch, 2014. The gamification of learning and instruction fieldbook: ideas into practice.San Francisco: John Wiley.

Little, B., 2012. Perspectives on Learning Technologies." St. Albans: The Endless Bookcase.

McChesney, R. W., 2013. Digital disconnect: how capitalism is turning the Internet against democracy. New York: The New Press-

Miller, V., 2011. Understanding Digital Culture."London: SAGE Publications.

Newsletter, 2017. Companyofthought.com, "Industry insights for e-Learning",http://companyofthought.com/, accessed on 20th May. 2017.

Noyce, R. 2017 Article, interview in a magazine: "Knowledge is power. Knowledge shared is power multiplied.". Quotes.net, http://www.quotes.net/quote/42045, accessed on 21st May. 2017.

Paine, N., 2014. The learning challenge: Dealing with technology, innovation and change in learning and development.” Philadelphia, PA: Kogan Page.

Robinson, K., 2011. Out of our minds: learning to be creative. ”Fully revised and updated edition. Oxford: Capstone.

Robinson, K., Aronica, L. 2015. Creative schools: the grassroots revolution that's transforming education.” New York: Viking.

Schadler, T., Bernoff, J., Ask, J. 2014. The mobile mind shift: Engineer Your Business to Win in the Mobile Moment.” Austin, TX: Groundswell Press.

Education Tools

SHOWBIE: A TOOL FOR SHARING CONTENT		TEREZA HAVRÁNKOVÁ, MARCELA KRAUZOVÁ Institute of Applied Language Studies University of West Bohemia Czech Republic
e-mail of corresponding authors: truzickova@icloud.com, marcela.krauzova@gmail.com		

Key words: showbie, iPad, digital, sharing, homework

Abstract: In the era of digital space, we intend to find different ways in which to be connected with our students and we search for effective tools for sharing content and feedback in class. Last year one of the authors of the article implemented a course management app Showbie into an English class of 15 students, and applied the app for sharing worksheets, collecting homework and giving feedback. The paper explores the Showbie app as such, its strengths and weaknesses, and the impact of using Showbie in a language class for assigning extra-work activities. The second part of the paper focuses the on the results of a research which was conducted in order to support a hypothesis that students prefer completing assignments using a digital tool rather than the traditional paper form.

Introduction

Mobile devices have become an integral part of our lives. It is indisputable that they have also become a part of the education process in which we talk about mobile learning. O'Malley et al. (2003) have defined mobile learning as taking place when the learner is not at a fixed, predetermined location, or when the learner "takes advantage of the learning opportunities offered by mobile technologies" (as cited in Kukulska-Hulme & Traxler 2005, 1). Moreover, mobile learning has also become a significant part of language learning.

Mobile Assisted Language Learning (MALL) is the term that detonated an approach to learning a foreign language with the help of a mobile device. Kukulska-Hulme has summarized MALL as the use of "mobile technologies in language learning, especially in situations where device portability offers specific advantages" (as cited in Guler, Gunseli, Gedik 2015). Ting has pointed out advantages such as more flexible, accessible, and personalized learning; where these advantages should ideally increase the level of engaging encouragement, productivity and the effectiveness of second language learning (as cited in Kim and Kwon 2012, 34).

In addition, Palalas (2012) has mentioned some of the learning opportunities, saying that MALL "adds a new dimension to language practice, namely exposure to the language in times and locations accommodating students' preferences. It affords exposure to authentic language samples and challenges in location-specific communicative situations and provides support required for such situated learning" (Palas 2012, 26). Burston (2014) has additionally emphasized that mobile devices provide remarkable communicative potential, which "can be used to foster productive learner–learner interactions" (Burton 2014, 344).

Furthermore, Kim and Kwon (2012) have listed benefits of MALL as the following. "First, MALL enables students to more easily and more promptly access language learning materials and communicate

with people at any time, from anywhere. Second, the nature of digital technology facilitates students' participation in both collaborative and individualized language learning activities synchronously and/or asynchronously allowing rapid development of speaking, listening, reading and writing skills. Third, mobile technology provides various resources and tools for language learning that encourage learners to be more motivated, autonomous, situated (site specific), and socially interactive"(p. 35).

In sum, mobile assisted language learning is perceived as very appealing as it enables learning anytime and anywhere. It addition it is considered to be very appealing both for students and teachers as it can enhance interaction and stimulate motivation to language learning.

The aim of this paper is to focus on using mobile technology in language learning, specifically the integration of a course management tool called Showbie into an English class. Firstly, it presents Showbie and clarifies the term extra-work activities. Next it presents feedback from students of a secondary school English class. Lastly in summarizes the research findings and suggests recommendations for further investigation of this matter.

Showbie

Fundamentally mobile learning is based on integrating different software programs into the learning process. Kim and Kwon (2012) have suggested separating mobile apps into four groups, regardless of the original aim (educational and non-educational apps together). The groups are as follow: mobile social software (MoSoSo), mobile podcasting, software for automatic speech recognition (ASR) and course management service.

Showbie, course management software, was developed for a paperless classroom. The app was designed for the iOS platform, but is also accessible via web. The purpose of the app is to provide a service, which enables teachers to assign tasks to students, students to complete the task and submit, and finally teachers to review and provide students with feedback on their performance. This way, there is a possibility for a paperless classroom if applied for every activity processed during the class incorporated. In general, it is an on-line tool for sharing nearly any type of data for an extra–class work. Teachers can easily upload documents, images, instructions and comments for their students. The possible sources for such data are various; teachers can take a picture by the camera or add documents from their computer, Dropbox, Google Drive or any similar on-line data storage. Moreover, Showbie is connectable with thousands of other iOS apps. Teachers as well as students can adapt the data in the app's environment. There are useful tools, like a document viewer, pen and text tools and also voice notes that can be pinned to the page. Teachers also have the possibility to set a deadline for the assignment. Furthermore, all students receive an instant notification when a new task is assigned. Afterwards, students complete the assigned task. The app allows them a high level of learner autonomy, since there is more than one way to

solve the task; they can choose the time and place according to their needs. They can pin one or more comments into the original document, or they can submit an utterly new document, or they can choose even a more creative manner, e.g. a presentation.

Finally, teachers have precise information about which students have submitted the work and when exactly they did so. Similarly, to students' activities, teachers can provide a review of the students' work in different forms, most commonly as a written comment or a voice note.

Extra-work assignments

The greatest potential of course management tools is in the sharing and collecting extra-work assignments. Extra-class work, sometimes referred to as homework, is "one of the most important practices for establishing a successful academic environment" (Epstein 1983, 1). There is a link between learner`s autonomy and extra-class work, since the more autonomous the learners, the better they are and the more they can benefit from extra class work. As Ur (2012) has observed, "homework is not only a way to provide extra opportunities for language study outside the lesson, but also an investment in the future, in that it fosters students' ability to work on their own as autonomous learners and to progress independently of the teacher" (p. 55). In addition, Rutter, Maughan, Mortimore and Ouston have remarked doing extra-class work has a positive effect on learners' future academic performance and school behaviour (as cited in Epsteine 1983, 2). Therefore, there is not just the benefit of practising new learning skills or knowledge in doing extra-class work, but there is also an important positive effect on future study skills of the learners in general.

Traditional extra–class work vs. extra–class work based on technology

There is an increasing tendency to implement computers and mobile devices not only in school activities, but also in extra–class ones. Both types have their own pros and cons. The key features of both types can be summarized according to the key features: instructions, submission and its possible difficulties, and finally teachers' feedback.

Instructions. Traditional tasks are understood to be those based on pen and paper. These tasks are usually set orally (face to face); therefore, the teachers have to prepare instructions thoroughly so they are brief, clear and simultaneously comprehensive. Students on the other side have to listen carefully and take notes so they are able to fulfil the task successfully. In addition, those students who are absent must ask their classmates about the assigned homework afterwards.

Tasks that are assigned via technology (e.g. computer, mobile phone, tablet) are set electronically so the instructions are typically written. It is obvious that instructions for such tasks must be highly comprehensive in order to provide students with all the information needed as students have less opportunity to ask for clarification. However, students have the possibility to re-read the instructions as

many times as necessary. Assigning tasks via computer has another advantage over traditional version; it is available to all the students, both present and absent.

Submission of the extra–class work. It is common that students submit traditional tasks into the teachers' drop box, bring it to the following lesson or hand it in personally to the teacher during a given lesson. There is normally a defined deadline, which is connected to the students' classes and therefore, it refers only to participating students. Both the students and even more the teachers are supposed to carry the books with them.

Submission of tasks via technology seems logistically easier than submitting paper versions. Students have the possibility to fulfill and submit tasks any time until the deadline, which means diligent students may submit the task sooner and they do not have to pay attention to it any more and do not risk forgetting to bring the homework from home. However, online homework usually has a strict deadline set that cannot be delayed and is binding to all students, the present as well as the absent ones. Teachers gain an important advantage as well, as they are not forced to carry books home for grading the homework.

Feedback. Regarding the teachers' feedback on students' performance, Walberg, Paschal and Weinstein have observed that commenting and/or grading of extra–class work is important as it can possibly improve student learning (as cited in Penner, Kreuze, Langsam, Kreuze 2016, 1). However, there is usually a significant delay between students' handing in a pen and paper task and receiving information about their work, which may decrease the positive effect of homework on students' learning. On the contrary, online homework is typically provided with an instant feedback or is graded within a short period and informs students where they failed, where they were successful and even allows retries (as cited in Penner, Kreuze, Langsam, Kreuze 2016, 1). This way students can react and redo the extra–class work while it is fresh in their mind.

Technical issues. There are no technical obstructions if the extra class work is assigned in the students' book or workbook. The only risk whatsoever is the fact that students might forget their books at home. This act might be sometimes intentional, as students want to camouflage the fact they have not fulfilled the task.

Contrarily, several technical obstacles may accompany submissions of computer based homework such as inability to connect to the Internet or log on to the system. It follows that students may experience frustration, as they wish to do the homework However it is impossible due to technical issues (as cited in Penner, Kreuze, Langsam, Kreuze 2016, 5).

Research Methodology

The methodology of the research was designed to uncover the advantages and disadvantages of a course management tool Showbie in a language class. The research was conducted in the school year of 2015/2016 and the gathered data were believed to underpin the assumption that students are more encouraged to complete the extra-work assignments when using a course management tool. The information was obtained with a combination of different approaches: a questionnaire, data analysis of submitted tasks via Showbie and a teacher reflection on her experience with using Showbie.

The participants of the research were students of an English class of a private grammar school in Pilsen. The class consisted of 15 students (10 girls and 5 boys).

At the time of the research, the students attended the 5th year of an 8-year program. In other words, students were 15 or 16 years old and their English level was A2/B1. Moreover, each student of the class possessed an iPad as this device is an obligatory school supply of all the students who attend the school.

The software Showbie was applied by one of the authors into the lessons in the year 2015 for a number of reasons. First to reduce the consumption of photocopies, secondly to enhance sharing materials in class and lastly to stimulate the students to complete the assigned task. It is important to mention that the attitude in extra-work activities in this class was extremely low. Students were not used to submitting their homework in other classes or submitting their homework past the given deadline.

In the first week of the school year 2015/2016, all 15 students from the English class downloaded the app Showbie onto their iPads and created a free account. After that they were given an access code to their „virtual“ class in Showbie where they could find all the assigned tasks, submit their homework and read a review from their teacher.The authors of this article selected 3 different methods of the research: questionnaires, data analysis and reflection of a teacher.

a) Questionnaires

The aim of this questionnaire was to receive feedback on the app and to learn about the advantages and disadvantages of using the app in a language class from the students' perspective. They used the course management software the whole school year of 2015/2016. Students were asked to give their feedback on the app via an online questionnaire in June 2016.

The link of the online questionnaire was posted to Showbie in the middle of June. In the end 10 out of 15 students submitted the questionnaire. Four students were absent and one student terminated his studies during the school year.

b) Data analysis

The second part of the research was based on a data analysis of the assigned and collected task. Although the app was used for the period of 10 months, the research focused closely on seven different tasks between April 5 and June 7 2016.

c) Reflection of a teacher

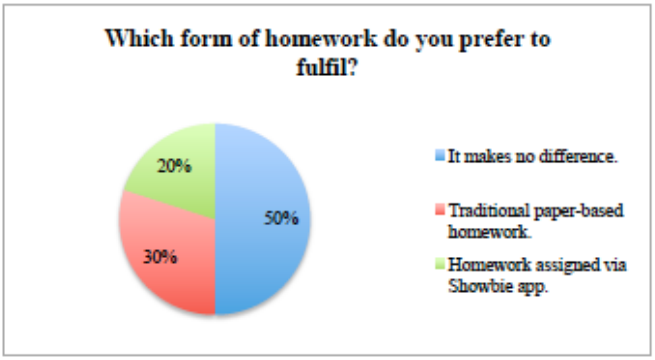
The app Showbie was implemented into the English lessons by one of the authors of this article mainly to improve sharing documents and collecting extra-work activities. The choice of Showbie was inspired by the author's weeklong experience at ESSA Academy in Bolton UK. Teachers of this academy receive very positive feedback using Showbie in their classes and the app is used for homework submission in different subjects (also in the P.E. class). The Author's class Showbie was used not only for assigning and collecting homework but also to distribute print screens, links of videos and pictures before or during the class.

Data presentations

a) Questionnaires

The questions of the survey reflect the research questions and the results are presented in the form of graphs and commented on below.

GRAPH 1. STUDENTS' PREFERRED FORM OF EXTRA–CLASS WORK.



Source: own

Five learners answered they give no preference to the form of the extra–class work. Three students prefer traditional pen-and-paper tasks and two students give priority to mobile version of homework. Regarding the age of students, it is quite surprising that the following question proved that a half of the students give no strict preference to the form of the extra–class work. Furthermore, there were only two students, who said they preferred the tasks assigned via mobile application Showbie to paper-based tasks.

The next part presents transcription of students' answers. Students were asked the question "What is the biggest advantage on doing HW via Showbie app to you?" and they mentioned various advantages; they are according to them as follows:

"It is quick, and as soon I submit it, I do not have to care about it anymore."

"It is more interesting than the extra–class work with a textbook."

"It is simple."

"I can submit it anytime, since I always have my mobile phone on me."

"It does not have to be printed, therefore, it is more difficult to forget it at home."

"I do not have to sit at the desk."

"I do not spend money on paper. In addition, I can submit it anytime."

"It is well arranged and it enables quality communication between the student and the teacher."

"It is quick. I like the availability to have it on me all the time."

"I can always see the whole correct assignment."

In addition, students were also asked the question: "What is the biggest disadvantage on doing HW via Showbie app to you?". The ideas named by students are listed below.

"It works only with the Internet connection. I cannot submit homework without it."

"Sometimes I do not notice a new homework, even though the app sends me notifications."

"I prefer paper–based tasks."

"I have an older iPad, so the app sometimes freezes."

"I do not always want to do the task. I do not like English grammar."

"The teacher can assign a new homework anytime."

"I prefer pen-and-paper tasks."

"I am often interrupted by the Messenger."

"There is no disadvantage to me."

"That I cannot excuse on forgetting the homework at home."

When students were asked to give what advantages they see in using technology in extra–class work, most often they mentioned the possibility to submit homework at any time (3 out of 10 students). Two students appreciate that such tasks are quick. Other advantages were mentioned by one of the students, and these are as follows. For one student it is more interesting compared to traditional task. Another student sees economical reason for app-based task as there is no need to print it. Connected to physical form of the task, one student likes the fact, that in contrast to paper-based homework, there is less danger of forgetting it at home. Another student observed that a mobile device allows variability of places even at home; there in no necessity to sit by the table. Finally, some students mentioned the technical

specifications of the app, saying it is clearly arranged and it enables to see the complete and correct instruction. Moreover, app provides, according to one student, a tool for efficient communication between the teacher and the student.

Students were also asked for the disadvantages they observed while working with the app. Most of them mentioned technical issues such as they are limited by the Internet connection or that their device is older and gets frozen. Another student is interrupted by the messenger. Next, two students claimed that they perceive the possibility of the teacher to assign homework anytime as negative, since the notification might be overlooked. Then, two students remarked they prefer traditional pen-and-paper homework. One student stated that there is no excuse on forgetting the homework at home when it is a mobile version. One student stated he did not like English grammar, which is not relevant to the topic of homework based on technology. Finally, one student said there is no disadvantage of using mobile technology in extra–class work.

b) Data analysis

All data that were available in the app were taken down to the Table 1. Students' real performance in extra–class work was introduced and compared to their answers in the questionnaire.

TABLE 1. OVERVIEW OF STUDENTS' SUBMISSION OF PARTICULAR EXTRA–CLASS WORK

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7	Results	Results
	assigned Apr 4, 12:50pm; due Apr 5, 4:00pm	assigned Apr 5, 2:18pm; due Apr 6, 8:15pm	assigned Apr 5, 3:02pm; due Apr 6 8:15pm	assigned Apr 6, 8:34am; due Apr 13, 4:00pm	assigned n.d.; due April 27, 4:00pm	assigned May 2, 3:24pm; due May 3, 12:00pm	assigned June 6, 12:19pm; due June 7, 1:00pm	Total numer of submitted tasks per student	Expressed in percentage
Student 1	Apr 4, 1:04pm	Apr 5, 2:41pm	x	x	May 2, 12:59pm			3	42%
Student 2	x	x	x	x	Apr 27, 8:58am	x	x	1	14%
Student 3	Apr 4, 1:00pm	Apr 5, 2:42pm	Apr 6, 7:56 am	Apr, 8:50am	x	x	x	4	57%
Student 4	x	x	x	x	x	x	x	0	0%
Student 5	x	x	x	x	May 2, 12:54pm	x	x	1	14%
Student 6	x	x	x	x	x	May 4, 8:51am	x	1	14%
Student 7	Apr 4, 12:59pm	x	Apr 5, 8:31pm	x	x	May 3, 10:10am	June 7, 8:30am	4	57%
Student 8	x	x	x	x	x	May 3, 11:19am	x	1	14%
Student 9	x	x	x	x	Apr 28, 4:06pm	x	x	1	14%
Student 10	Apr 4, 1:08pm	x	Apr 6, 8:22am	x	x	May 3, 11:14am		3	42%
Student 11	Apr 4, 1:06pm	x	Apr 5, 4:17pm	x	x	May 2, 2:10pm	June 6, 10:15pm	4	57%
Student 12	x	x	x	x	x	x	x	0	0%
Student 13	Apr 4, 1:05pm	x	Apr 6, 8:32pm	n.d.	May 1, 5:22pm	May 3, 7:18am	June 7, 6:40am	6	86%
Student 14	x	Apr 5, 2:44pm	Apr 6, 6:05pm	n.d.	x	May 3, 11:24am	June 7, 11:16am	5	71%
Student 15	x	x	x	x	x	x	x	0	0%
Total number of students who submitted	6	3	6	3	5	7	4		
Expressed in percentage	40%	20%	40%	20%	33%	46%	26%		

Green color illustrates completion of extra–class work in time, orange color represents late submission, and grey color signalizes which tasks were done only partly.

What can be seen in the table is that students who submitted Task 1 and Task 2 did so shortly after it was assigned. Therefore, it can be reckoned that they complete the task at school, maybe during a break.

Most students submitted Tasks 1, 3 and 6. Six students submitted Task 1 and this fact fully corresponds with the questionnaire, since this task was focused on reading skills. On the contrary, Tasks 3 and 6 were based on writing; firstly, students were asked to write about a historical mystery, and secondly the task was to write an essay on the topic "What if…". This choice fosters the position of creative writing among other language skills.

Altogether, students submitted 35 out of 105 tasks. The highest amount ofsubmitted work was performed by student number 13, who submitted six tasks. On the other hand, there were three students who did not submit any of the assigned extra–classwork and five students submitted only one out of seven.

What is obvious from the table is the fact that students do not perceive the deadline to be binding and sometimes submit their work with delay. This was the cause in eight tasks out of all 35 submitted. Moreover, in nine examples students fulfilled an incomplete task.

As mentioned before, most students (seven) submitted Tasks 6; however even this did not prove students' claim from the questionnaire, that they usually complete the task, to be true. Since, Task 6 was submitted by 46% of students, and all tasks together were completed by 23% in average. This is far away from the results shown in the Graph 3.

To conclude, there are significant differences between what students think aboutextra–class work and what they perform in reality. However, all these differences might have been caused by various external factors.

c) Reflection of a teacher

The final part of the research reflects the experience of a teacher who implemented Showbie into an English class. Throughout of the implementation of the app, one the authors of this text observed the following advantages and disadvantages in addition to those listed in the theoretical part of the article.

Considering the advantages of Showbie, the app is very effective when tracking students` progress. The app shows who have submitted their homework and when it was submitted. The submitted tasks are then archived and teachers can easily check the students' progress. Another advantage of the app is that it allows teachers to give students instant feedback in written or spoken form and teachers see who fulfills the task on time or past the deadline.

As far as disadvantages the main inconvenience is the password, which is required when signing in the app. Some students do not remember their password and are unable to sign in during the lessons. Students often have to reset their password or create a new profile, which takes them a notable time. Another

disadvantage is that the free version of the app has a limited number of features. For instance, the free (basic) version does not enable to submit tasks in forms videos or grade the submitted tasks.

After the one-year experience with using Showbie and receiving feedback from students, one of the authors of this text would definitely not make assignments via Showbie exclusively. On the contrary, the author would try to find a compromise of assigning extra-work using the traditional form and Showbie to let students benefit from both approaches.

Conclusion

The study was an attempt to address the issue behind implementing course management software Showbie into the English classroom to assign and collect extra-work activities. The summary of the feedback reveals surprising facts about deploying course management app into a language class. Although the conducted research had a low number of respondents, it indicates that there is a slight preference in submitting homework using the traditional paper based form.

The results of the data analysis have also proved that a mobile course management app does not encourage students to complete and submit the assigned task. When analyzing the submitted extra-homework activity none of the seven tasks was submitted by more than 46% of students. So statistically, the data from the app did not confirm students' statement that the majority of them usually complete the extra–class work. However, as mentioned, the polled group of student was rather small and other external factors might have influenced the research. Therefore, the gained findings cannot be generalized.

As far as advantages listed by both the teacher and the students it is the mobility of time and space that makes this app preferred to the traditional form. In addition one of the students found this app an effective tool for communication with teachers. On contrary when listing the disadvantages of the app, students mostly complained about the technical aspects when working with the app: disabled Internet connection, low performance of processor, that fact that they are disturbed by other applications while doing the homework, and finally possibility to overlook and/or overhear the notification about a new homework. Moreover, two students observed they like the traditional tasks better.

Further use of this app or other apps with similar features seems to be encouraged by the findings yet more research is needed to measure the value of the app. For example, it would also be interesting to collect feedback from students of different ages and language levels who use the app on a daily basis for longer than a year, and compare different ways of using this app for homework assignments (instructions, feedback, types of activities).

References

Burston, J., 2014. “MALL: The pedagogical challenges”, Computer Assisted Language Learning, 27 (4), pp. 344-357.

Epstein, J., L., 1983.”Homework practices, achievements, and behaviors of elementary school students”, Baltimore: Center for Research on Elementry and Middle Schools.

Guler, D., Gunseli, O. & Gedik, N. 2015. “Research trends in mobile assisted language learning from 2000 to 2012”, ReCALL, 27, pp.197-216.

Kim, H., & Kwon, Y. 2012. “Exploring smartphone applications for effective mobileassisted language learning”, Multimedia-Assisted Language Learning, 15 (1), pp. 31-57.

Kukulska-Hulme, A., & Traxler, J. (Eds.). 2005. “Mobile learning: A handbook for educators and trainers”, Oxon: Routledge.

Kukulska- Hulme, A. 2009. “Will mobile learning change language learning? “, ReCALL, 21 (2), pp. 157-165.

Palalas, A. 2012. “Design guidelines for a mobile-enabled language learning systém supporting the development of ESP listening skills” (Unpublished doctoral dissertation), Athabasca University, Canada. Retrieved from http://hdl.handle.net/10791/17, accessed on 21st May. 2017

Penner, J., Kreuze, E., Langsam, S., & Kreuze, J. 2016. “Online homework versus pen and paper homework: do the benefits outweigh the costs?”, Journal of Contemporary Business Issues, 21 (1). Retrieved from: http://www.wiu.edu/cbt/jcbi/documents/NAASFeb2016/SpecialNAASIssueFeb2016-OnlineHomeworkVsPenAndPencilHomework.pdf, accessed on 21st May. 2017.

Ur, P. 2012. “A course in English language teaching”, Oxford: Oxford University Press.

SHARING KNOWLEDGE IN HIGHER EDUCATION: COLLABORATIVE TEACHING, COLLABORATIVE LEARNING AND ICTS

CHRISTINA MAROUL, ANASTASIA MISSEYANNI

Environmental Studies
Deree - American College of Greece

e-mail of corresponding author: cmarouli@acg.edu

Key words: collaborative learning, collaborative teaching, co-teaching, Higher Education, sharing culture.

Abstract: Higher education has been characterized by individual work, both in teaching and learning. It appears that as we move from the lower levels of education to higher education, individual work is exalted. As interdisciplinary or transdisciplinary work is increasingly understood as a need for effective real problem solving, collaborative work has also been promoted in higher education, starting from research. Collaborative learning practices in universities and colleges have also multiplied.

In this work, we will discuss both collaborative learning, which has been more investigated, and collaborative teaching. However, how is it possible to effectively promote collaborative learning if students are immersed in an individualistic learning culture? We advocate that collaborative teaching and collaborative learning are two sides of the same coin. Thus, discussing them in connection may lead to very useful insights. The increasingly frequent introduction and adoption of ICTs in higher education has also a significant influence in this effort for sharing teaching and learning at this educational level.

Thus, in this presentation /paper, we will discuss effective collaborative teaching and learning practices, possible obstacles and solutions to them, as well as contributions to creating a collaborative culture in higher education, starting from selected co-teaching or collaborative learning experiences of ours in STEM disciplines with a focus on Environmental Studies and based on relevant literature. We will also investigate how the use of ICTs can contribute to this transition to a sharing culture in higher education. Our aim is to propose a strategic model for collaborative teaching and learning in higher education and especially in STEM.

Introduction

Higher Education has long depended on individual work, of both professors and students. With the increasing need for effective and integrated solutions to pressing and intricate social and environmental problems, societies and markets require interdisciplinary work, ability to (co)create knowledge and innovative problem solving. In this context, these themes have now become significant concerns in Higher Education. Globalization has led to the creation of multicultural settings, in society and economy at large and inside universities, requiring new abilities to collaborate with all kinds of different people, in highly diverse settings.

These trends have challenged Higher Education institutions to seek collaboration across disciplines, between academics, industry and technology, as well as collaborative learning spaces.

The significance of collaborative learning and collaborative teaching in Higher Education is increasingly being recognized. Collaborative learning practices have been effectively investigated (Smith and MacGregor 1992; Slavin 2010; Johnson, Johnson and Smith 2014), while research on collaborative teaching in Higher Education is still developing. We view collaborative learning and collaborative teaching as two sides of the same coin. We are in agreement with the view that our example teaches louder than our words. Thus, if we want effective co-creators of knowledge and future generations of professionals and citizens that are capable of collaborative thinking and work, we need to show students how collaboration works, what skills it takes, what challenges you face in such a team work context and

what helps make it work, via collaborative teaching. We advocate that we need both collaborative learning pedagogies and collaborative teaching practices.

On the basis of this proposition, in this paper, we will investigate collaborative teaching and learning practices via a discussion of 2 selected cases from the Sciences, and especially Environmental Studies taught in Greece. We will attempt to investigate: the benefits of collaboration (teaching and learning) in Higher Education; the challenges collaborative teaching and learning practices face in Higher Education; and what makes collaboration in the Higher Education teaching and learning contexts effective. We will also refer to the ways Information and Communication Technologies (ICTs) have been used to support collaboration in these contexts.

On the basis of the main lessons-learnt from our case studies, we will propose a strategic model for collaborative teaching and learning in higher education and especially in STEM.

Collaborative teaching and learning: What are they?

Before we proceed to the discussion of our topic, let us define our main terms: collaborative learning and collaborative teaching.

Collaborative learning involves joint intellectual efforts by students, or instructors and students together and it may take many different forms. Group projects, group discussion, problem solving in groups, peer teaching, brainstorming, debates are some examples. As a pedagogic approach, collaborative learning engages students in their learning, rendering them co-creators of knowledge, working along with their peers. Approaches to collaborative learning may vary in their goals, methods used, level of structuring as well as the outcome of the team work (Smith and MacGregor 1992). In many cases, "students team together on an assignment. In this method, students can produce the individual parts of a larger assignment individually and then 'assemble' the final work together, as a team." (Diaz, Brown and Salmons 2010, 1–4). Cooperative learning is a more structured form of collaborative learning that involves small-group work on a structured activity, and in the context of which, group members bear responsibility for their individual work but also for the group work as a whole. (Diaz, Brown and Salmons 2010, 1–4).

Collaborative teaching has been defined in several ways (Cook and Friend 1996, 12-14; Conderman, Pedersen and Bresnahan 2009, 2; Ferguson and Wilson 2011, 53; Bacharach, Heck, Dahlberg 2008, 9); however, it generally involves collaboration of two or more educators in delivering substantive instruction to a group of students in the context of a class / single learning space. Aside of the working-together aspect of collaborative teaching, some authors indicate that collaborative teaching implies work "that could not have been done as well alone" (Ferguson and Wilson 2011, 53). Collaborative teaching is only one of the terms that has been used to refer to this practice; other terms for such instructional activity include co-teaching or team teaching. In this paper, we will use the terms collaborative teaching or co-teaching

interchangeably. Co-teaching refers to a variety of collaborative practices, reflecting a different distribution of the responsibility for the class among the instructors, in all the different stages of instruction: planning, instruction, assessment.

A theoretical background

Teaching is a human activity aiming to the development of cognitive capabilities. According to Vygotsky (1978), learning is a mediated activity which develops via the interaction of humans with the social context and objects or cultural tools (like language, learning activities, but also ICTs, etc.). This view highlights the importance of the procedural aspects of learning and uncovers the significant correlation of the organization of the learning process and social interaction in class with the learning outcomes. Learning is development via interaction (Murphy, Scantlebury and Milne 2015, 286). "Activity theory posits that it is the contradictions between experiences and each other that evoke change" (Ferguson and Wilson 2011, 54), and subsequently learning. Thus, not only teaching is a process but also learning: a process with human subjects, cultural objects, outcomes, tools, community, rules and division of labor. Given the procedural nature of learning, the selection of the cultural objects and tools to be used, as well as the goals and desired outcomes is significant and should be done with conscious consideration of the social context. For example, the use of all sorts of information technologies in the young generation makes them good candidates for use in the learning process, but their use should be adjusted to the desired learning goals.

Collaborative teaching uncovers the significance of different experiences, bodies of knowledge and approaches. It also reveals the dialectical nature of knowledge development, which involves questioning, contradictions, at times conflict, and self-reflection. It demystifies the omniscience of experts and thus, has the potential to invite an engaged and creative stance to learning and knowledge (Conderman, Pedersen and Bresnahan, 2009). Co-teaching also models collaboration for students, an alternative modus vivendi in education. For this reason, it was introduced in the 1960s in the context of "progressive education" (Ferguson and Wilson 2011, 53).

Collaborative learning provides a space for trying out and synthesizing different theoretical claims, different ways of working and learning, and different value systems. Building the capacity to listen to different voices, to resolve conflict, to reach an agreement that represents all members of a team are crucial aspects of living in a community. Numerous studies on collaborative learning in higher education indicate that it increases student engagement in academic work and leads to better knowledge acquisition and higher levels of cognitive development (Smith and MacGregor 1992; Johnson and Johnson 2014). Through dialogue and interaction with other students and the instructor, students become better critical and creative thinkers. They also acquire leadership skills, public speaking and communication skills, ability to influence others and ability to work as members of a team; these skills are all important for their future careers

(Pascarella and Terenzini 2005). Collaborative learning also leads to a better overall university experience for students and helps their integration into the academic community (Kuh 2009).

Collaborative teaching and learning provide symbolic spaces where a creative and multi-dimensional process of learning can take place. This is in line with Vygotsky's concept of development, which foresees a non-linear process, with not only "evolutionary but also revolutionary changes, regression, gaps, zigzags and conflicts" (quoted in Murphy, Scantlebury and Milne 2015, 28).

As Vygotsky's approach reveals, emotion is important in the learning process; it is emotion that mobilizes development, learning and change (Murphy, Scantlebury and Milne 2015, 286). Collaborative learning challenges the lonely trajectory to knowledge and development and provides opportunities for emotions to arise and be expressed. When these are positive they easily mobilize the next step of the learning process; if they are unpleasant, they mobilize a self-reflective process which is very important in learning. Collaborative teaching also generates emotions as a consequence of the interaction of the instructors in all the stages of the instruction. These emotions and subsequent interactions and self-reflections, along with challenges or conflicts that may arise in the co-teaching process result to professional development and new learning for the instructors as documented in relevant literature.

Collaborative teaching and collaborative learning can both be enhanced by the use of ICT tools. Online interactive tools delivered through course management systems and communication through social media are two examples of such tools widely used by instructors. The potential of ICTs to promote an active learning environment and increase collaboration and knowledge sharing in higher education is huge and has not been fully explored.

Methodology

In this paper, we focus on two selected College science courses – especially from Environmental Studies – in which co-teaching and/or collaborative learning practices were adopted. We used a grounded theory approach. For this study, we used self-reflective questionnaires – with both closed and open ended questions - and focus groups for instructors of both classes. For students, in one course, we used students' self-reflective essays, which focused primarily on the group work of the course, and in the other, an in-class questionnaire focusing on the co-teaching aspects.

Case studies

Background – description:

The Integrated Methods course was taught for 5 years and it was planned to cover a diversity of natural and social science methods that are relevant to environmental studies. As its first version – co-taught by 5 instructors - proved to be a very heavy course, it was split into two courses: one focusing on natural science methods – co-taught by 3 instructors - and another one focusing on social science methods. Both versions are co-taught courses as they are multidisciplinary. One instructor acted as the coordinator

although the planning, teaching (primarily in the form of alternate teaching, with some team teaching in field and lab activities and occasional) and assessment were done collaboratively. This course involved individual assessments but collaborative work in the field and lab activities. Here, we will focus more on the recent course on the natural science methods.

The Greening the Campus course was designed as a par-excellence example of Education for Sustainability, i.e. integrative / interdisciplinary, co-taught, involving group projects on topics related to campus needs (e.g. waste and water management, energy efficiency, green roofs on campus), and aiming to produce products that are useful to the College. It has been taught 5 times and it has developed in this time. The first year, the instructors' group planned the course collaboratively, shared teaching and supervision of field work based on expertise, while the coordinator was present in all class meetings; the main instructor assessed the outputs and others provided comments too. In the 2nd year, there was collaboration with a NGO for the execution of the field work, with the support and involvement of the Director of the Technical Services. The 3rd and 4th years, the course was team taught, with collaborative planning and assessment, and alternate teaching during lectures and parallel teaching during field work. The 5th year, the course involved collaborative planning and assessment; there was a main instructor due to thematic expertise and a second one for support and special topics. The course involved group projects based on field work on campus, collaborative creative work and individual theoretical and reflective essays.

Results and discussion:

a. Collaboration

Co-teaching, as understood by the instructors, implies shared responsibility for a shared goal, with agreed roles in an agreed process. Oftentimes, alternate teaching was used, where each instructor taught subjects related with their field of expertise, alternating presence in the class; this model was adopted for practical reasons as well - due to the instructors‘ workload. Team teaching during field and lab work and in a few occasions, the one teachs – one observes model was adopted. In both courses, as instructors aimed to promote active and engaged learning, some form of collaborative learning was included. The backbone of the Greening the Campus Course is collaboration between faculty and among instructors and students in a common learning process, reflecting its conception as an Education for Sustainability course where social and behavioral change is desired. It appears that this is at least somewhat achieved. One of the students of this course, in his/her reflective essay wrote: “To sum up, in my opinion, it is a course that can change one‘s beliefs and way of behavior, as it did to me. I, now, know better than before how to behave and what actions to take in order to be more ecofriendly not only to the environment but to any other living being.”

b. Significance of interpersonal relations and good rapport

Instructors view good rapport among instructors, an agreed and clear action plan right from the beginning, and flexibility as important for a good co-teaching experience. Thus, interpersonal relations and interactions are considered of high importance. Frequent discussions and meetings throughout the course to discuss important aspects of the course and possible challenges were proposed as very important for a successful collaborative teaching experience.

Collaborative learning activities, such as group projects or group work in the field or laboratories, especially when they relate to assessed outputs tend to cause an initial anxiety in students. But as the group work develops – usually with the beginning of the data collection - and members start knowing each other better and developing rapport, they feel more comfortable and often end up appreciating the benefits of group work. Students learn from and create knowledge with their peers. They develop teamwork, communication and leadership skills, which they can then more readily apply in their professional life. Group work also urges students to take responsibility for their learning and cultivate individual responsibility in the context of a community.

c. Knowledge benefits from collaborative teaching and learning

Instructors saw several benefits in a co-teaching experience. Co-teaching is a good example for students in terms of sharing and co-creating knowledge, while it provides an opportunity for the involved instructors to communicate enthusiasm and passion about their topic to students. This was also appreciated by students, as stated in the student questionnaire. A student explicitly identified “more communication and team work” as the main benefit of his/her experience in the co-taught course. However, students primarily emphasized the benefits from exposure to multidisciplinary materials and knowledge. Collaborative teaching also supports instructors‘ professional development as they learn from each other, they are exposed to alternative teaching approaches and they are pushed to reflect. Another instructor mentioned that co-teaching helps make teaching fun and enjoyable, if it works of course.

Students reiterate this characteristic of collaborative learning work: students gain more knowledge as several of them pull their resources together, exchange ideas and are exposed to different perspectives.

d. Challenges in collaborative teaching and learning

The challenges that instructors identified as the main obstacles in co-teaching approaches referred to *institutional culture and support*. Two faculty members stated that they were put in a position to defend the value of collaborative teaching in response to concerns of the administration. Collaborative teaching poses practical challenges in the way Higher Education institutions have been structured, for example faculty work load and remuneration. Instructors mentioned remuneration as a challenge for co-teaching as it does

not reflect the considerably increased time needed in the planning and implementation of a co-taught course.

A main challenge of collaborative learning efforts is to *cultivate a culture of collaboration and sharing* in a class, especially in social and institutional settings such as Higher Education. Students are not used to collaborative work or sharing responsibility for an output or outcome. Several student respondents mentioned that they did not have much experience in group projects and thus found them worrisome in the beginning, especially when that could affect their grades. Assessment strategies in Higher Education constitute another constraint to a collaborative learning culture and thus, they should be carefully thought out and adjusted to support collaboration. Collaborative teaching experiences are good examples for students in terms of sharing and co-creation of knowledge (Conderman, Pedersen and Bresnahan 2009b).

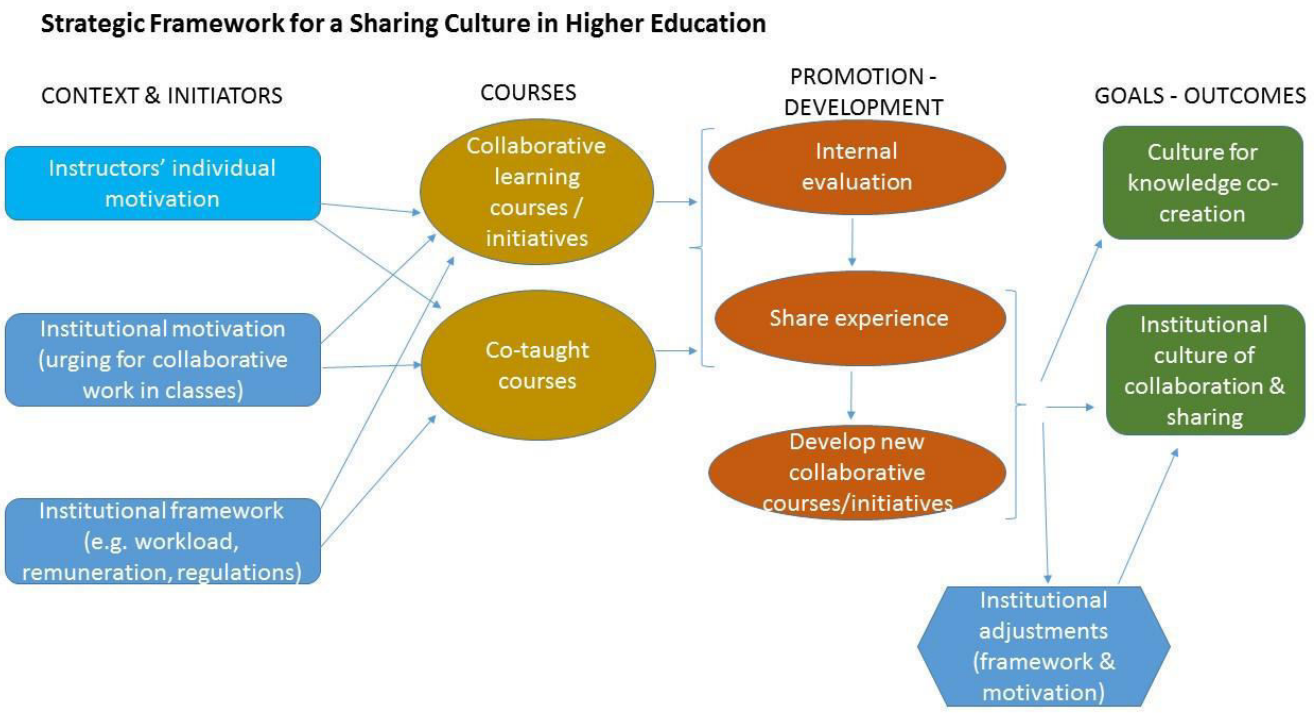
In one of the courses, *coordination* was mentioned as one of the most challenging aspects in co-teaching. Students of that class also identified coordination as lacking and one indicated that this had negatively impacted his/her learning process. In the other course, instructors stated that it was very beneficial that they discussed together all issues arising and decided together on the best approach. Coordination is also important in group projects and collaborative learning in general. The groups that are most successful together decide the object of their work, their roles, actions to be taken and an action plan, while they meet regularly to check and report on each member's progress. In such settings, usually one member takes a coordinator role, even if only unofficially.

Another challenge of co-teaching identified by students is the *inconsistent use of information technologies* – i.e. Blackboard - by instructors. As they uploaded documents in a different way or in different virtual places, some students were confused. Nevertheless, instructors used basic information technologies for their communication. Students, on the other hand, in the context of their group work, often used social media like Facebook, or Blackboard discussion boards for exchanges for their group work. So, Information and Communication Technologies are tools that can practically support a sharing culture by facilitating feedback mechanisms among all participants (Çakıroğlu, Kokoç, Kol and Turan 2016); however, they should be used with clear goals, a good understanding of their capacities, and in a way that it does not cause confusion either in terms of access or in terms of content.

A strategic proposition for collaborative knowledge creation

As the discussion above reveals, collaborative teaching and learning is a new necessity and is on the rise. Such initiatives have clear benefits for students and instructors, but also face noteworthy challenges. We hereby present a strategic framework for the promotion of collaborative teaching and learning in Higher Education, identifying the main parameters for success. The figure below is a schematic representation of this strategic framework.

FIGURE 1. A STRATEGIC FRAMEWORK FOR A SHARING CULTURE IN HIGHER EDUCATION



Source: Own

According to our model presented in figure 1, instructors‘ individual motivation and/or an expressed institutional desire for collaborative work in classes are possible initiators for any forms of collaborative work in higher education. The existing institutional framework in terms of policies, faculty workload and instructor remuneration may promote or inhibit collaborative work in Higher Education. Where there is individual or institutional motivation for collaborative teaching and learning, course curricula may be redesigned to favor more collaborative learning approaches as well as co-taught courses. As a next step, individual courses using collaborative practices will be evaluated, experiences will be shared among instructors and students and these will serve as a lesson for the development of new collaborative courses and initiatives. The further development and promotion of such courses is expected to gradually lead to a culture of sharing and co-creation of knowledge, not only among individual instructors and students involved, but also at the level of the institution, thus bringing also the necessary institutional adjustments. The establishment of the appropriate framework from the part of the institution will further support and enhance the culture of sharing and collaboration across the academic community.

Conclusion

Although Higher Education does not automatically support a sharing culture, collaborative learning and teaching initiatives have now been introduced and are increasing in frequency. Still, we have a lot to learn in terms of the strategies that can enhance such collaborative knowledge creation, and especially in the context of Higher Education. The existing socio-economic and environmental challenges, which translate

into globalized communications, need for integrative and multidisciplinary problem solving, and need for cross-cultural understanding and collaborations, are reinforcing contextual forces. In this context, Higher Educational institutions are called to modify their operations and render them more conducive to collaborative teaching and learning practices. Furthermore, the same institutions should prepare future leaders and educators for collaborative and multidisciplinary enterprises by offering courses that are collaboratively taught and/or provide collaborative learning experiences, ideally serving a community need. As discussed above, some strategies that cultivate collaborative knowledge development/creation include: increasing the motivation of instructors, students and academic institutions as a whole by emphasizing the benefits of knowledge sharing and collaboration; careful design of any form of collaborative learning activity as well as of co-taught courses; good planning, coordination and clarification of roles for both instructors and students; developing a fair and clear assessment strategy for any assessed group activity; achieving consistency in the way learning resources are used among instructors in cases of co-taught courses; flexibility and readiness to resolve conflict and achieve a constructive dialogue; using ICTs in a clear and consistent manner to facilitate interaction. Finally, ensuring the existence of the appropriate institutional framework in terms of instructor training, policies and infrastructure is essential for initiating and supporting any efforts for collaboration and knowledge sharing in higher education.

References

Bacharach, N., Heck, T.W., Dahlberg, K., 2008. "Co-Teaching In Higher Education." Journal of College Teaching & Learning, March 2008, pp. 9–16.

Çakıroğlu, U., Kokoç, M., Kol, E. and Turan, E., 2016. "Exploring Teaching Programming Online through Web Conferencing System: The Lens of Activity Theory." Educational Technology & Society, Vol. 19 No 4, pp. 126–139.

Conderman, G., Pedersen, T. and Bresnahan, V., 1996. "Taking the Plunge: What Is Co-Teaching All About?", in: Purposeful Co-Teaching: Real Cases and Effective Strategies. Corwin. pp. 1–19.

Conderman, G., Pedersen, T. and Bresnahan, V., 1996b. "Teaching So They Are Engaged.", in Purposeful Co-Teaching: Real Cases and Effective Strategies. Corwi, pp. 105–123.

Cook, L., and Friend, M., 1996. "Co-teaching: What is it all about?" Teaching Exceptional Children 29 (1), pp. 12–14.

Diaz, V., Brown, M. And Salmons, J., 2010. "Unit 5: Collaborate Teaching and Learning Strategies." EDUCAUSE Learning Initiative, pp. 1–4. Accessed at https://net.educause.edu/ir/library/pdf/eli80085.pdf on 10th May 2017.

Ferguson, J., and Wilson, J., 2011. “The Co-Teaching Professorship: Power And Expertise In The Co-Taught Higher Education Classroom.” Scholar-Practitioner Quarterly, 5 (1), pp. 52–68.

Johnson, D.W., Johnson, R.T., and Smith, K.A., 2014. “Cooperative learning: Improving university instruction by basing practice on validated theory.” Journal on Excellence in University Teaching, 25 (3&4) pp. 1–26.

Kuh, G.D., 2005. “Student engagement in the first year of college.”, in: L.M. Upcraph, J. N. Gardner, & B. O. Barefoot (Eds.), Challenging and supporting the first year student, San Francisco, CA: Jossey-Bass, pp. 86–107.

Murphy, C., Scantlebury, K., and Milne, C., 2015. “Using Vygotsky’s zone of proximal development to propose and test an explanatory model for conceptualising coteaching in pre-service science teacher education.” Asia-Pacific Journal of Teacher Education 43 (4), pp. 281–295.

Pascarella, E., & Terenzini, P.T., 2005. “How college affects students: A third decade of research.” (Vol. 2). San Francisco, CA: Jossey-Bass.

Roth, W.M., and Tobin, K.G., 2004. “Coteaching: From praxis to theory.” Teachers and teaching: Theory and practice 10 (2), pp. 161–180.

Slavin, R., 2010. “Co-operative learning: what makes group-work work?”, in: The Nature of Learning: Using Research to Inspire Practice, OECD Publishing, Paris.

Smith, B.L., and MacGregor, J.T., 1992. “What is collaborative learning?”, in: Goodsell, A.S., Maher M.R., & Tinto V. (Eds.), Collaborative learning: A sourcebook for higher education. University Park, PA: National Center on Postsecondary Teaching, Learning, and Assessment, pp. 10–29.

Vygotsky, L.S., 1978. “Mind in Society”. Harvard University Press, Cambridge, MA.

USER PREFERENCES OF ELECTRONIC TEXTBOOKS WITH REGARD TO THE DIDACTIC COMPONENTS AND ORIENTATION IN STRUCTURE OF THE TEXTBOOK

JAN KROTKÝ
Faculty of Education
University of West Bohemia in Pilsen, Czech Republic

KATEŘINA BAMBASOVÁ
Elementary School Bor u Tachova
Czech Republic

e-mail of corresponding author: conor@kmt.zcu.cz

Key words: multimedia textbook, didactic components, interactive teaching, multimedia teaching, textbook research.

Abstract: The article is focused on research of multimedia and interactive (electronic) textbook structures and the interaction of their elements and users. The authors seek answers particularly from the field of parameter optimization of multimedia and interactive elements and other components. They study how the users perceive the selected components and what issues may arise in example with orientation in a textbook or its parts.

The aim is to optimize the parameters of selected elements and provide some recommendation to editors of electronic textbooks for elementary education. The recommendations mean a feedback between the editors of learning materials and a group of their products users regarding the solutions used.

5 respondents participated in the research – primary and secondary school teachers (users) with different length of teaching practice. The research tool is a set of verified universal questions including the ones about the structure and form of studied multimedia textbooks – the didactic availability and several specific tasks per each textbook sample. The authors analysed the structure of 3 different electronic textbooks.

The involved parameters are among the others time, needed by the user to fulfil the task, or for example even personal opinion of the respondent regarding certain programming solutions.

The research method is a structured interview combined with pedagogical experiment and observation. The data obtained are qualitatively analysed and compared with the previous results of the research carried by M. Elgrová from 2014.

Introduction

Methods of evaluating textbooks may be divided into three main areas (Mikk 2007). The analysis of structure and components and its use is the simplest one. This group also includes the methods of monitoring didactic facilities of textbooks, which is after some alterations applicable on electronic textbooks too, as J. Krotký found (2015). Apart from the Průcha method (1998), there is also a proven tool to analyse components. The tool has a form of EPASoft questionnaire and was developed at the Institute for Science and Mathematics Education at Kiel University or an evaluation model from Cape Breton University (Binet, Jackson 2010). Other methods of evaluation are based on a pedagogical experiment when the textbook is implemented directly in the lesson. The method is the most beneficial to the educational process as it can extract information directly from the practice. The third method is social filtering. The method is based on the evaluation of textbooks by respondents and is dependent on their experience and professional judgement. The research conducted in 2011 among students, whose task was to evaluate the educational software according to the evaluating questionnaire drawn up in advance, confirmed significant differences between the evaluations (Krotký 2015). Also H. S. Tokmak, L. Incikabi and T. Y. Yelken (2012) from the Mersin University deal with the differences in evaluations of the educational software between experts and novices. In their article Differences in the educational software evaluation are listed some results of their qualitative comparative case study. Finding weaknesses in understanding the meaning of the evaluation criteria, especially in the group of novices, belongs among the

main findings of the study. The group of experts took the way of finding the relevant information in literature or online if they had any doubts. On the contrary, the non-expert group mostly discussed the meaning of the criteria (Tokmak, Incikabi, Yelken 2012).

It follows that it is necessary to have a complete group of evaluators, respondents if we want to relevantly monitor the quality, structure or content of an educational document using the pre-set criteria.

If we interconnect the evaluation according to the criteria with the evaluation by different respondents, we may get interesting and new information which cannot be captured or presumed by e.g. evaluation sheet.

An electronic textbook should have similar content and function structure, alike with the paper textbook (Krotký 2015). Apart from the text, bearers of information are also multimedia and bearers of interactivity are particularly hypertexts in all their varied form. The interactivity is understood at two levels, as the interactivity for program control (buttons, links etc.), but namely as a bi-directional process between the pupil, program and teacher (Dostál 2009).

The functional element of the textbook, also called the hybridism of communication interface, mediates the interaction between a reader and an electronic online medium. The elements simplifying the orientation may be taken from printed texts and the deeper they are rooted the more manageable they will be for the readers (Szabó 2016). The components of multimedia textbooks may apply various cognitive learning styles to pupils and that way they are easily adaptable to their educational needs (Klement, Dostál, Marešová 2014).

K. Szabó (2016) talks about multimedia elements as about the motivation elements to increase the attention of readers. At the same time, he highlights the dangerous of too excessive use of those elements. R. E. Mayer refers to the problematics as to “multimedia paradox” (Mayer 2001). Each element should have its foundation based on its own didactical approach. In extreme situations, it may even reach the underestimation or misunderstanding of the elements represented in online text (Vrbík, Michalík 2012). Keeping the readers in attention and his motivation is solved not only by using attractive components available directly in the text online. Both, the motivation and the activity, of students may be stimulated through the use of new technical teaching tools too (Štich, Simbartl 2013; Mainz, Lovasová, Magdin 2012).

Multimedia textbooks or e-textbooks in general, are not just a superstructure of a paper textbook or its e-version. The essential difference is in new ways of their use. At the level of Czech education, the use of the media may be defined as blended learning, that means the combination of learning at school – work with textbooks e.g. interactive board and distance learning, learning with a textbook at home and using its online components (usually interconnection to various databases, registers and encyclopedia). K. Szabó

(2016) reminds an interesting finding. As a rule, we do not read long texts on the screen. The electronic medium is formed for bigger diversity, but smaller amount of mono-oriented information. Short, non-literature texts are typical for e-texts (it is related to the strategy of online reading), however, they have been applied at modern paper materials for distance education too (Lepil 2010). Multimedia textbooks allow implementing the latest technologies and yet the form can have its weak points. Except a certain discomfort during reading from screens or while using e.g. 3D components, A. Mangen and his team (2013) point out some issues with memory during listing in an e-book. On the other hand, listing in a paper book rather stimulates our memory (Mangen, Walgermo, Brønnick 2013).

Methodology and Research Progress

Aim of the research – The main aim is to provide editors of multimedia textbooks with a feedback on the perception of structure of multimedia textbooks and used components. Another goal is to verify a set of questions and framework tasks of semi-structured interview designed for finding preferences of choosing a multimedia textbook by a user. The last aim is to compare and revise the conclusions of the previous research in relation to a different group of respondents (ICT students (Elgrová 2014) versus teachers from practice).

Methods – M. Elgrová introduced a model of research of preferences of multimedia textbooks users in 2014. Her research tool – the semi-structured interview with specific tasks was modified for a new group of analysed multimedia textbooks. The tool is specific especially in its implementation of the experimentally approached tasks which aim to verify the user's orientation in the e-textbooks.

Sample of respondents – The selection of respondents is an important part, which makes the work different from a survey carried out by M. Elgrová (2014). M. Elgrová worked with five students of master study of teaching at Faculty of Education.

For the survey, there were selected teachers with different experience from the area of education (again 5 people) and with different levels of working with ICT. All the respondents work at the same school and except one (first stage of elementary school) they all teach at the second stage of the elementary school – particularly Mathematics, Physics, Czech, History, Music, German, English and Physical Education. Four respondents were women with experience of 2, 9, 7 and 40 years. The last respondent was a man with practice in education for 32 years. In the Czech Republic, compulsory school attendance begins for children at the age of 6. The attendance of elementary schools lasts 9 years when children usually move one grade up each school year. The first stage (ISCED1) corresponds to the 1^{st} – 5^{th} grade and there are usually children at the age from 6 to 10. The second stage (ISCED2) corresponds to 6^{th} – 9^{th} grade and is attended by children from 11 to 14 years old. Passing all 9 years of the school attendance successfully, children may choose what kind of high school they would study (ISCED3). (Unesco 2012) However, to get there, they have to pass entrance or talent examinations.

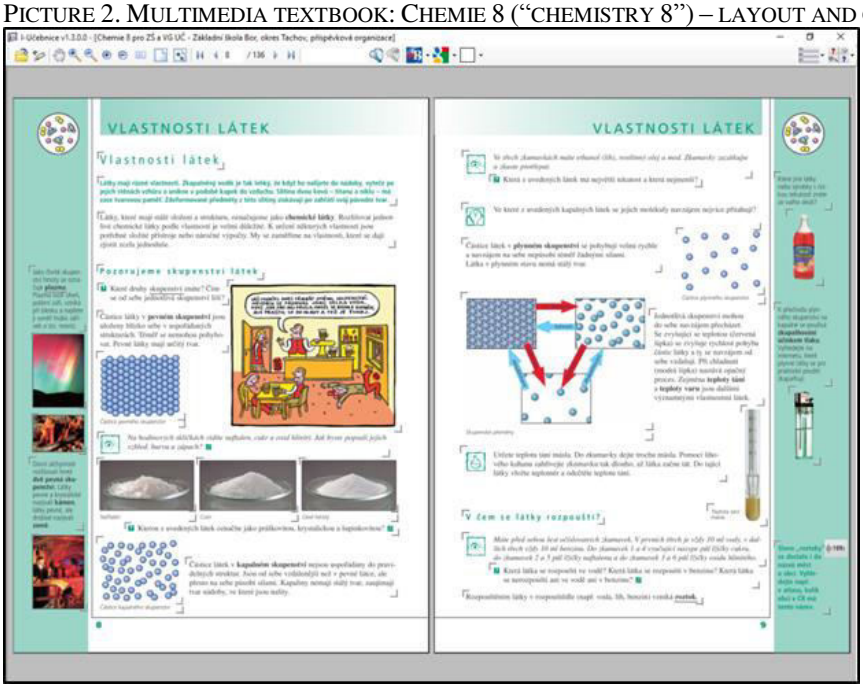
Set of learning materials for the survey – 3 multimedia textbooks from different publishing houses were chosen for the survey – Já a můj svět (published by Nová škola, picture 1), Chemie 8 (published by Fraus, picture 2) and Pontes 1 (published by Klett, picture 3).

The multimedia textbook Já a můj svět and Chemie 8 have been verified in teaching. Particularly, they are used frequently at the elementary school where the survey was conducted. The textbook Pontes 1 was chosen to get information regarding the structure of multimedia textbook published abroad.

PICTURE 1. MULTIMEDIA TEXTBOOK: JÁ A MŮJ SVĚT ("ME AND MY WORLD") – LAYOUT AND COMPONENTS

Source: Nová Škola publishing

PICTURE 2. MULTIMEDIA TEXTBOOK: CHEMIE 8 ("CHEMISTRY 8") – LAYOUT AND COMPONENTS



Source: Fraus publishing

PICTURE 3. MULTIMEDIA TEXTBOOK: PONTES 1 – LAYOUT AND COMPONENTS

Source: Klett publishing house (Klett AG group)

The interview consisted of three sets of questions. **The first set** was related to information about the work level of the teacher with ICT technology, teaching-learning programs and multimedia textbooks. The aim of this part was primarily to map present experience of the respondents.

The second set is formed by the questions regarding the multimedia textbooks which are involved in our research. The questions are partially the same like M. Elgrová (2014) asked and partially new. The set consists of three blocks with questions and tasks. All the set of general questions and tasks is listed in the table 10, however, the interview is modified for the specific multimedia textbooks. We will measure the time of accomplishing the last task of the block no.3 and its results will be compared for all the respondents.

TABLE 1. INTERVIEW STRUCTURE – QUESTIONS AND TASKS	
Block 1	**Visual Side of Textbook**
Question no. 1	How do you evaluate the overall graphic design of the textbook? Is it suitable for the appointed age group of pupils?
Question no. 2	In your opinion, is the textbook well organized?
Question no. 3	From the visual point of view, are there any elements in the textbook which appealed or did not appeal to you?
Task no. 1	Open the textbook page no. X. Is there used the sufficient amount of graphic means to understand the learning material? Would it be convenient to use different graphic objects? If so, which would they be?
Block 2	**Content of Textbook**
Question no. 4	Do you think that the analysed textbook includes the adequate amount of text considering the grade it is designed for?
Question no. 5	Does the textbook contain passages which would be possible to use for pupils with a specific learning disorder?
Question no. 6	Did the textbook include any summary of learning materials? Note: Is it important to you (from the textbook to prove the overview)?
Question no. 7	Does the textbook interface with other subjects, daily life or cross-curricular topics? If so, try to give an example.
Question no. 8	Do you think that the textbook is more time-demanding regarding preparation in comparison with a paper textbook?
Question no. 9	Does the textbook include questions and tasks?
Question no. 10	Are there any curiosities in the textbook?
Question no. 11	Does the textbook include the instructions on how to work with the textbook?
Task no. 2	Open the textbook pages X and Y. Evaluate whether the learning material is processed graphically. Note: Use the scale from 0 (missing graphic) to 5 (really visual).
Block 3	**Functioning of Textbook**
Question no. 12	Does the textbook include enough of multimedia and interactive elements? Were there any parts in the textbook which missed multimedia elements and they would fit there?
Question no. 13	Is it adequate (from the point of using multimedia elements) to use the textbook in multimedia form or would it be sufficient with its printed version?
Question no. 14	Does the textbook include a register of symbols for the control of multimedia elements?
Question no. 15	Does the textbook include multimedia elements which seem to you inventive, convenient or interesting? Which are those and why?
Question no. 16	Does the textbook include multimedia elements which seem to you useless or inappropriate for the use? Can you remember them and the reason?
Question no. 17	Which elements from the book helped you with the orientation? Which elements, on the contrary, complicated it?
Task no. 3	Open the textbook page XY and play the complementary video.
Source: Original M. Elgrová (2014), revision K. Bambasová (2017) Note: Characters X and Y are generalizations for different pages in a multimedia textbook.	

The questions listed above applied for all three textbooks. The tasks were of the same framework, just had to be modified considering the content of each textbook.

The last part of the interview is formed from questions related to the general frame of selected multimedia textbooks (table 2).

TABLE 2. INTERVIEW STRUCTURE – RESPONDENTS OPINIONS

Supplementary questions	
Question no. 1	Would you choose this textbook for your class?
Question no. 2	Would you use the textbook just in the frontal projection or would it be available for each pupil?
Question no. 3	Tell us strong and weak points of the textbook.
Question no. 4	How much time would you dedicate to work with the multimedia textbook in your lesson? How would you structure this time from the point of lesson organization (note the teacher and his work with the textbook, pupils and their work with the textbook…).

Source: K. Bambasová (2017)

Survey progress – The interview and experiment were conducted individually with each of the respondents. First of all, the used expressions such as interactive, multimedia etc. were explained as well as total flow of the survey, including its time demands. Further it was followed by the introduction of the textbooks step by step and the interview. Comments to the responds were recorded immediately. After five-minute introduction of the textbook, the respondent answered the prepared questions and solved the given tasks.

Research Results

Results – Visual Part of Multimedia Textbooks (Block 1)

There were mixed opinions regarding the graphic design of the textbook Pontes 1. All the respondents agreed that the textbook is graphically well arranged and suitable for the given age group (pupils at the first stage of elementary school). From the point of orderliness, three respondents answered the book is well organised, one said it was chaotic and the last respondent said it was partially poorly arranged. The respondents mentioned the colour design of the book, text arrangement and number of pictures.

Chemie 8, the multimedia textbook, was ranged by the respondents regarding the graphics slightly better. Based on their opinion, it is suitable for the determined age group. All agree that it is well arranged and organized. None of the respondents would add elements in its graphic design of the specific page (task no. 1), the arrangement is adequate according to them. One respondent was really excited by the textbook and another one mentions its parallel with the printed version and **points out the convenient comments on the edges of the textbook pages.**

A huge enthusiasm reached also the graphic design of the textbook Já a můj svět. All respondents were satisfied with the graphic look of the textbook and its arrangement for the determined age group. One respondent even answered that the textbook is **beautiful, another one that it is inventive and well arranged.**

Results – Content of Textbook (Block 2)

The questions related to the content of the textbook Pontes 1 got mostly positive responds. That means that the respondents think the textbook contains the following:

- Sufficient amount of text (considering the target group of pupils);
- Passages which may be used for teaching pupils with specific learning disorder;
- Interconnection with other subjects or daily life (e.g. History or Arts);
- Questions and tasks, interesting points (e.g. history).

The answers to questions about the content of the multimedia textbook Chemie 8 were similar to the previous textbook. The respondents mostly answered yes, which signifies that the book included the components we asked about. Just the time demands for preparing the lesson with this textbook would be, according to four respondents, smaller than in the case of the printed textbook.

For the questions regarding the textbook Já a můj svět and its content, some answers were more detailed, particularly in terms of cross-curricular relations and references to daily life. The situation from the previous cases of evaluating textbooks repeated, most components included in the questions are represented in the textbook. According to majority of respondents, the time demands for preparing a lesson with this book would not be bigger and half of the respondents did not notice whether the textbook provides instructions how to work with the textbook.

Conclusion: Responds in this block, which was focused on the visual side of the textbook, were de facto the same for the first two cases. The respondents answered more in detail the questions about the third book Já a můj svět and highlighted its cross-curricular relations and references to daily life. The textbook really includes **infinite number of tasks, images, photographs and so on to develop pupils' skills in Mathematics, Music, Art etc.**

There was a question in the block 2 whether it is important to the respondents that the multimedia textbook provides its summary. They all answered affirmatively that **it is important to them, some would appreciate a summary by chapters.**

Results – Functioning components of Textbook (Block 3)

Three respondents answered that the textbook Pontes 1 has enough of multimedia and interactive elements, however, two would welcome more of these elements. All the respondents would use this

textbook in its multimedia form too and one would use its printed form for all his pupils. Four respondents did not notice whether the textbook includes a register of symbols used to control multimedia elements. **Sound records of "the printed" texts of articles, interconnection of references or insertion of comments** were mentioned as inventive multimedia elements. Among the elements which make the orientation easier were listed **hypertext links and help.** The textbook seemed to be chaotic to one respondent, who found it hard to orientate in it.

Respondents were not much satisfied with the number of multimedia elements in the multimedia textbook Chemie 8. They would add e.g. videos. One respondent commented that there were few elements in comparison with the other analysed textbooks. The majority would also use the textbook in its printed version only. The interactive elements were not found as inventive – they only commented the function of **picture zooming.** They did not indicate specific elements which would make the orientation in the textbook easier – except one, **the register of symbols,** which explains only the forms of work of pupils or teachers though.

According to the respondents, multimedia elements are to a sufficient extent presented in the textbook Já a můj svět and all would also use the book in its multimedia form. The stated interesting multimedia elements were videos, photographs, interactive games and interactive activities (Krotký, 2009). The respondents mention also its **simplicity of control, pagination and presence of a manual bar on each page.** Only one respondent said that the textbook has **a register of symbols for the multimedia elements control.**

Conclusion

In the part of the survey regarding the visual side of the multimedia textbooks, we have come to a similar conclusion like M. Elgrová (2014). The survey conducted by M. Elgrová found out that the most preferred book, from the point of the graphic design, was a multimedia textbook which is designed more like a training program. Based on that, the author concluded that the graphic layout of textbooks is **irrelevant** criterion in the process of choosing one (Elgrová 2014). Even in our survey none of the respondents minded that all the analysed textbooks are rather multimedia superstructure to the typical textbooks. All the analysed textbooks have established the printed paper version (of course, without any interactive or multimedia elements). Some of our respondents would like to work with the multimedia version of the textbook, although they would appreciate to have its printed version available for each pupil too. The results of both of the surveys were the same regarding the tasks defined for the visual part of multimedia textbooks (questions 1-3 and task no.1).

In the part of the questions dedicated to the content of the multimedia textbooks, the respondents named the frequent presence of cross-curricula relations and interconnection of the learning material with daily life, especially in the multimedia textbook Já a můj svět. Alike the respondents of teaching programs in the

survey of M. Elgrová appreciated the interconnection of the learning materials and real life. Based on that, we may come to a conclusion that **both of the groups, in this case, searched for and appreciated the same elements.** For both of the groups is also important whether the textbook provides a summary of the learning materials. The authors of a research probe, P. Knecht a M. Weinhöfer (2006), came to the same conclusion that for both of the groups it is important to find the learning materials summary and cross-curricula relations in the textbook. The probe was conducted at elementary schools in South-Moravian region and they analysed what textbook criteria are important to teachers in the process of selecting a textbook for Regional Geography of the Czech Republic. The research probe supported our survey as well as the survey of M. Elgrová (2014) and therefore we may state that **the learning materials summary and the interconnection across individual learning subjects form the important part of the textbook** for the users. This block of questions included a task where the respondents had to evaluate the illustrative nature of the multimedia textbook. Looking at the point rating by students of teaching program (the research by M. Elgrová), the evaluation within one analysed book is always different.

At two textbooks, active teachers agreed on **the same rate of points while evaluating the illustrative nature of the multimedia textbook.** By coincidence, the subject to our survey as well as the one conducted by M. Elgrová was formed by two multimedia textbooks published by the same houses – Fraus and Nová škola. That is way we may assume that both of the textbooks from the same publishing houses will have the same structure. The layout of the textbooks published by Fraus (Chemie 8 and Matematika 6) is really equal, even their design. The point rating given by teachers (Chemie 8) is the same in all cases, i.e. four points (from five possible). The average evaluation of the multimedia textbooks by the same publishing house was according to the students of teaching program 3.8 points. Bot of the results may be marked as comparable. However, the opinions regarding the textbooks published by Nová škola – Matematika and Já a můj svět differed in both groups. The textbook Já a můj svět received the best rating in our research, which means 5 points from each respondent. The multimedia textbook Matematika was rated on the average from the view of its illustrative nature – 3.2 points which is more then by 2 points worse result then the evaluation given in the research to another book published by the same house. We remind that it was the evaluation of illustrative nature – task no. 2. The two-point difference may be related to several factors:

1. Different group of respondents (ICT students versus teachers from practice);
2. Textbook topic ("abstract" Mathematics versus practical topic Já a můj svět);
3. Misunderstanding of the term illustrativeness by the respondents.

The time taken by the respondents to activate a multimedia element of the textbook was measured in the task no. 3, which formed a part of the functioning of the textbook. The results may be compared with the

time of activating an exercise in multimedia textbooks resulting from the survey by M. Elgrová (2014). The students of teaching programs were able, except one textbook, to switch the element on within 5-10 seconds. Our respondents (teachers from practice) were able to activate the multimedia element within a period of 14-30 seconds. It can support the assumption stated by M. Elgrová that the students of Informatics **possess better disposition to work with computers, and so with the multimedia textbook as well.** At the same time, a research from the field of approaches to using ICT conducted in 2012-2013 at the Faculty of Education in Pilsen confirmed the positive attitude of these students (Bureš, Přibáň, Rohlíková 2014). Nevertheless, the conclusion does not have to apply at our new group of respondents – teachers from practice. Again, if we compareboth surveys and the results regarding the textbooks from the same publishing houses (Fraus and Nová škola), then the respondents in the interview by M. Elgrová took the longest time (in average) to activate the exercise in the textbook by Nová škola, although the difference was minimal. The same situation repeated in our survey too.

References

Binet, A., Jackson, A., 2010. "Software Evaluation Model", http://mrbinet.pbworks.com/w/page/27909921/Software%20Evaluation%20Model, accessed on 10th November 2016.

Bureš, M., Přibáň, T., Rohlíková, L., 2014. "Attitudes of students at higher education institutions towards ICT in education". 10th International Scientific Conference on Distance Learning in Applied Informatics. Praha: Wolters Kluwer, pp. 263-273.

Dostál, J., 2009. "Interaktivní tabule ve výuce". Journal of Technology and Information Education. Olomouc, Univerzita Palackého, 1 (3), pp. 11-17.

Elgrová, M., 2014. "Kritéria výběru multimediálních učebnic", Plzeň, Diplomová práce. Západočeská univerzita v Plzni. Fakulta pedagogická.

Knecht, P., Weinhöfer, M. 2006. "Jaká kritéria jsou důležitá pro učitele ZŠ při výběru učebnic zeměpisu?", http://www.ped.muni.cz/weduresearch/publikace/0012.pdf accessed on 15th January 2017.

Klement, M., Dostál, J., Marešová, H., 2014. "Elements of electronic teaching materials with respect to student's cognitive learning styles". International Conference on Education & Educational Psychology 2013 (ICEEPSY 2013), Book Series: Procedia Social and Behavioral Sciences, Vol. 112, pp. 437-446.

Krotký, J., 2009. "Interactive activities in the presentation in light of the type and using". Trends in education 2009: Information technologies and technical education. Olomouc, Vol. 1. pp. 472-475.

Krotký, J., 2015. “Nové formy tvorby multimediálních učebnic“. Plzeň, Disertační práce. Západočeská univerzita, Fakulta pedagogická.

Lepil, O., 2010. “Teorie a praxe tvorby výukových materiálů”. Olomouc, Univerzita Palackého.

Mainz, D., Lovasová, V., Magdin, M., 2012. “Influence of project-based learning in informatics on the mental condition of high-school students”. 8th International Scientific Conference eLearning and Software for Education, Book Series: Leveraging technology for learning. Vol. 1, pp. 208.

Mangen, A., Walgermo, B.R., Brønnick, K., 2013. “Reading Linear Texts on Paper Versus ComputerScreen: Effects on Reading Comprehension.” International Journal of Educational Research, Vol. 58, pp. 61-68.

Mayer, R.E., 2001. “Multimedia Learning”. Cambridge: Cambridge University, Press.

Mikk, J., 2007. “Učebnice budoucnost národa.”, in: Maňák, J., Knecht, P. (Eds.), Hodnocení učebnic. Brno: Paido.

Průcha, J., 1998. “Učebnice: teorie a analýzy edukačního média.” Brno: Paido.

Szabó, K., 2016. “Reading from screen – About the problem of developing online educational texts regarding the special ways of online reading strategies.” 11th International Conference DisCo 2016 on Towards Open Education and Information Society, Prague: Centre for Higher Education Studies, pp. 78-89.

Štich, L., Simbartl, P., 2013. “Utilization of Activating Teaching Tools in Education”, in: eLearning and Software for Education. Quality and efficiency in e-learning, Vol. 2. Bucharest: 'Carol I' National Defence University Publishing House, pp. 173-176.

Tokmak, H.S., Incikabi L., Yelken T.Y., 2012. “Differences in the educational software evaluation process for experts and novice students.” Australasian Journal of Educational Technology. Vol. 28, No. 8, pp. 1283-1297.

UNESCO Institute for Statistics, 2012. “International Standards Classification of Education ISCED 11.” Montreal, Canada, pp. 30-33.

Vrbík, V., Michalík, P., 2012. “Možné užití multimediálních aplikací v eLearningu. Přístupy k evaluaci eLearningu.” Ostrava: Ostravská univerzita. Pedagogická fakulta, pp. 127-141.

USE OF MOBILE TECHNOLOGY IN VARIOUS DIDACTIC SITUATIONS IN MATHEMATICS EDUCATION IN PRIMARY SCHOOL

LILLA KORENOVA

Faculty of Education
Comenius University in Bratislava, Slovakia

e-mail of corresponding author: korenova@fedu.uniba.sk

Key words: M-learning, Primary education, Mathematics, The Learning and Teaching Process.

Abstract: Taking advantage of smartphones and tablets in education is very interesting, particularly because pupils often have their own devices. It is a piece of technology that children have a natural and positive relationship with; therefore if they were to use them during the educational process it might be motivating for them.

Carefully designed and custom-tailored mobile classroom learning applications have been found to be valuable in bridging the gap between indoor and outdoor learning. In particular, mobile learning applications serve as assistive didactic tools that contextualized learning content previously introduced in the classroom. This is achieved by exemplifying and augmenting formal classroom learning experiences in outdoor scenarios, thus enabling students to actively and dynamically construct an understanding of their activities (Melzer et al. 2007).

Successfully bridging indoor and outdoor classroom learning is a complex task which includes the use of technology in an individual, social and organizational contexts. These factors comprise the heterogeneity of the involved teachers, students and researchers, as well as their different levels of motivation, knowledge, and the specific learning goals or sub-goals, methodologies and devices, economic factors, and the interrelations and dynamics between these factors (Melzer et al., 2005).

In this paper, we would like to present information on the current status and the possibilities of using mobile technology in the teaching of mathematics in elementary schools in Slovakia. It includes a description of a qualitative research study that focuses on the learning and teaching process of pupils aged 9 to 11. During this process, mobile technology was used in many didactic situations.

Introduction

At the present, nearly all schools in Slovakia make use of digital technology in education. Most schools are equipped with computers and interactive whiteboards (often many) and teachers have access to notebooks with projectors. However, few schools have interactive whiteboards in every classroom, therefore they cannot use them all the time. Most students own a smartphone and more own a tablet. Despite this fact, education that incorporates mobile learning is spreading slowly.

Mobile learning features the use of mobile technology such as smartphones, tablets and PDA with internet access. New teaching possibilities arise through the use of mobile learning and blended learning. They "grant access" to different interactive and multimedia study materials on the internet.

Many projects, domestic and foreign, have focused on pilot projects aimed at implementing m-learning in schools. Information on 2 such projects currently running in Slovakia can be found at the following links: http://www.skolanadotyk.sk and http://www.digiskola.sk. The former project, “school by touch”, was an initiative of private companies which supplied 10 schools with interactive whiteboards and tablets for every pupil in a classroom. In addition, the teachers were trained and empirical research was conducted to determine the effectiveness of teaching through the use of this technology. Teachers created materials suitable for m-learning, and students created and shared videos from their classes. They are available at http://www.skolanadotyk.sk/materialy.html. Upon the completion of the project, the research team presented their findings at a conference; they stated that in all subjects except mathematics, significant

results were gathered that confirm the effectiveness of such education. This may have been due to the fact that mathematics teachers might be less experienced in the use of computer technology. The latter project started in 2014. Thanks to EU funding, the Ministry of Education of the Slovak Republic purchased 5680 interactive whiteboards, 5680 notebooks, 2686 colour printers, 20000 tablets and 1000 WiFi routers for schools all around Slovakia. At the moment, teachers are being trained in the use of tablets. In the next phase, the ministry intends to create digital content as well. In addition to these projects, mathematics teachers have embarked on several individual initiatives, which experiment with the use tablets and smartphones in the classroom.

This article deals with m-learning in the teaching of mathematics on the elementary school level. According to our findings, no research in the field of using mobile technology in the teaching of mathematics had previously been conducted in Slovakia. The goal of our research was to obtain answers to the following questions:

1. What are the advantages of m-learning in meeting the educational objectives in the teaching of mathematics to10 and 11year old students?

2. How do these advantages differ depending on teaching methods (specifically, the constructionist approach)?

3. How do these advantages differ depending on the use of smartphones and tablets?

Our qualitative research focused on two classes of 5th year elementary school students throughout the 2016/2017 school year, during mathematics classes that were strongly supported by m-learning. Our qualitative research involved the measurement of the students' knowledge by means of a test administered at the end of thematic units and a comparison of these results with the students' results achieved in other subjects.

The author of the article is the regular teacher of these two classes at the Hlboká Street Elementary School in Bratislava. Throughout the school year, she used constructivist methods and digital technology in the process of teaching mathematics, most often interactive boards, and mobile phones and tablets mostly owned by the students and parents. The qualitative research design was developed in close cooperation with Dušan Kostrub, who described some other research findings in other papers (Kostrub 2017).

Mobile learning

Digital technology enables teachers to make use of new educational methods such as the constructivist approach, controlled search, workshops and peer instruction. It is also very suitable for project teaching.

Teachers can make use of blended learning, the flipped classroom method, and others. Last but not least, computers are used for electronic testing in which the knowledge of the pupils is measured.

The technological and social changes that accompany the ubiquitous use of mobile devices are also reflected by the widely accepted notion that learning is continual and happens anywhere at any time (Gee, 2003). Unfortunately however, this stands in sharp contrast to the prevalent learning situation in schools, which is still almost exclusively focused on classroom-bound learning, mediated by a trained teacher. (Melzer et al. 2007).

Carefully designed and custom-tailored mobile classroom learning applications have been found to be valuable in bridging the gap between indoor and outdoor learning.

In particular, mobile learning applications serve as assistive didactic tools that contextualize learning content previously introduced in the classroom. This is achieved by exemplifying and augmenting formal classroom learning experiences in outdoor scenarios, thus enabling students to actively and dynamically construct an understanding of their activities (Sharples 2002).

Successfully bridging indoor and outdoor classroom learning is a complex task which includes the use of technology in individual, social, and organizational contexts. These factors comprise the heterogeneity of the involved teachers, students, and researchers, as well as their different levels of motivation, knowledge and the specific learning goals or sub-goals, methodologies and devices, economic factors, and the interrelations and dynamics between these factors (Melzeret al. 2007).

We can find several approaches to defining mobile learning in professional literature:

Mobile learning refers to the use of mobile or wireless devices for learning while on the move. Typical examples of devices used for mobile learning include cell phones, smartphones, palmtops, and handheld computers; tablet PCs, laptops, and personal media players can also fall within this scope (Kukulska-Hulm, 2007 cited in Park 2011).

Peters viewed mobile learning as a useful component of the flexible learning model. In 2003, Brown summarized several definitions and terms and identified mobile learning as “an extension of e-learning” (Peters 2007 cited in Brown 2005).

Taylor (2006) has defined mobile learning as “learning mediated by mobile devices, or the mobility of learners (regardless of their devices), or the mobility of content/resources in the sense that it can be accessed from anywhere” (cited in Traxler 2009). One-to-one learning with a mobile device falls into the same category of mobile learning in which learners use a mobile device (e.g., iPads, iPods, netbooks, laptops, cell phones, or other mobile devices) with Internet access to engage in learning activities. Many

school districts may restrict access to classroom use for fear of damage, losses or misuse (cited in Chou 2012).

Mobile Learning and Social Constructivism and Constructionism

This article deals with the teaching of mathematics based on social-constructivist and constructionist principles in a digital environment in which mobile learning is used.

The current theories of learning are based on constructivism, which, unlike behaviourists and cognitivists who acknowledge the existence of universal cognition independent of the students, assumes that students themselves create – construct their own knowledge of the world in which they live (Turek 2014).

This paradigm forms the basis for radical, cognitive, social, didactic and realistic constructivist streams. (Molnár 2015).

Social constructivism emphasizes the social and cultural aspects of education (adult authorities – teachers, parents, classmates, society, culture, language). Students construct cognition in their interaction with their environment. In connection with the teaching process, Vygotsky uses the term "zone of closest development". This refers to the space between two levels: the level in which the student is able to solve problems independently, without help, and the level in which the student is able to solve problems with the help (assistance) of someone else, e.g., a teacher. Learning is understood as a social activity, and the emphasis is placed on discussion and cooperation within a group in which the teacher acts as a co-worker, advisor or moderator (Turek 2014).

In the spirit of constructivist approaches, children are supposed to learn about the surrounding reality by means of their own activities, in other words, through constant exploration and discovery. Based on the constructivism of Piaget, Saymour Papert developed the theory of constructionism, emphasizing learning by making. We can effectively learn when we assume the role of creator, constructor, but in addition to creation, it is important to share the final product with others (Papert 1991).

The main representative of socio-constructivism (cultural-historical theory, social re-constructivism, critical theory and other terms) was Lev Semyonovich Vygotsky. His theory can be interpreted through the central concept according to which everything mental has its social origin, which emphasizes the active participation of the members of the learning group, the zone of closest development, a challenging process of socially influenced mental reconstruction, and the transformation of learning, referred to as interiorization (incorporation into one´s inner life); socially-induced elaboration as an interaction of minds; discursive discussions based on processes of interpersonal interaction, communicative transaction and mental intra-action, among others.

The main idea of constructivism was developed by Jean Piaget (organismic theory, genetic-cognitive theory, practical theory and other terms). Nowadays, the cognitivist theories of learning and teaching are inspired by a learning theory known as constructionism. The main proponents of the theory of constructionism are Seymour Papert and Idit Harel Caperton, who defined a concept of learning by creating and a concept of situating constructionism. In 1980, they joined the LEGO company and carried out a research project named "Epistemology and Learning Groups". The results of their research influenced the concept of the LEGO system of plastic construction toys. Their confrontation of constructionism and instructionism (behaviouristic and academic theories) contributed to the development of theories of learning and teaching. In connection with new technology, they studied the possibilities of children´s learning through the use of computers (and information and communication technology) and programming languages from the children´s/students´ point of view, rather than from the adults´ point of view of children/students (Kostrub 2008).

Constructionism enables the implementation of the process of teaching as a design that is a developed entity of information elaboration into a form of intelligent human thoughts, products and artefacts having mental, manual as well as expressive forms. The teaching process design is created by learning entities together with teaching entities – they play the roles of designers. These entities are protagonists of the active elaboration of information obtained from outside, and use the capacity to recognize and obtain relevant information, and at the same time, to search for information in the teaching problem and the teaching topic. Experiments with selected mathematical syllabi in combination with manipulation activities of students allow the subjects to change the perspective of viewing schoolwork – to see (understand) it also in other contexts (Kostrub 2017).

In this connection, we were convinced that teaching by means of digital technology, particularly mobile devices, in a constructivist and constructionist environment, would not only motivate students, but also lead to a more effective achievement of educational objectives while supporting deeper understanding and creativity.

Research Design and Implementation

We conducted the research in two classes of 5th year elementary school students (in total 45 students) at the Elementary School in Hlboká Street in Bratislava, from September 2016 to May 2017. Mathematics in these classes is taught by the author of this study.

Our research focused on analysing the use of mobile technology and manipulation activities in teaching mathematics based on constructivist and constructionist concepts. We looked into the problem of how to incorporate the use of smartphones and tablets in education. We believe that when these two methods are

combined, the students´ understanding is deeper, their motivation is greater, and, last but not least, their creativity is strongly supported.

For the purpose of the research, we chose a combination of qualitative methodologies. By means of the qualitative methodology, we wanted to better understand particular phenomena.

Qualitative study in the process of teaching enables the identification of several causative conditions because the process of teaching features controlled participation in human activities based on the implementation of cultural and discursive practices and learning and teaching subjects. The process of teaching offers time and space for educational phenomena and strategies influenced by various intervening conditions whose impact results in specific consequences (Kostrub 2016).

Qualitative research is a kind of science, communication and art, and the appropriately selected and applied research tool is an integrating element. The purpose of the research tool is to approximate research material and gather research data that are valuable and relevant for the given topic. Our research featured direct observation and partially video-recording. In gathering and analysing data, we proceeded as follows:

- Observation of teaching by means of video-recording.
- Analysis of observed data and video-recording, and data transcription.
- Open coding of transcribed data and creation of categories.

To interpret the research activity, we applied the open coding method, which, thanks to its simplicity and efficiency, can be used in a wide range of qualitative projects.

According to our findings, this was the first research project regarding the use of mobile technology in the teaching of mathematics in Slovakia.

Our qualitative research was based on obtaining answers to the following questions:

1. What are the advantages of m-learning in meeting the educational objectives in the teaching of mathematics to 10 and 11 year old students?

2. How do these advantages differ depending on the teaching methods (specifically the constructionist approach)?

3. How do these advantages differ depending on the use of smartphones and tablets?

Our research entailed the evaluation of questionnaires completed by the teachers by which we wanted to obtain answers to the following questions:

1. What do teachers think about using mobile technology in the teaching of mathematics?

2. What do teachers think about incorporating digital technology and mobile learning in the teaching of mathematics in terms of teaching methods?

Teaching content and applied means

In our research, we used mobile technology in a continuous manner. The students used their own smartphones and tablets connected to the internet through wi-fi (with the approval of the school director and their parents). The children who did not have their own smartphones were provided with tablets. The students worked in pairs or groups of three or four, or sometimes even individually. This study covers only some of the following units:

1. Written multiplication, non-traditional algorithms of multiplication
2. Solving word problems and problems designed to develop numeracy
3. Central and axial symmetry
4. The perimeter and area of squares and rectangles
5. A cube, a bloc and 3D geometrical objects

The use of smartphones and tablets in our research can be divided into several categories:

1. Video creation
2. Internet search for information
3. Reading of e-books and of other e-documents
4. Voting
5. Mobile applications including augmented reality applications
6. GeoGebra Software, materials on the GeoGebraTube portal.

The creation of video-recordings by students is an activity that requires clear assignments by the teacher at the start of the class. The students were given the task to create an instructional and explanatory video to be used by their classmates. It could be a model solution of an interesting and reasonably difficult mathematical task or a method for determining the area of an irregular plane figure drawn on a large, square piece of paper, or an explanation of an algorithm of non-traditional methods of written multiplication, such as the Chinese and Indian multiplication methods. This activity is also indirectly connected with the search for information on the internet. In some cases, the students had to search for additional information on the internet when solving verbal tasks from real life that required the use of specific data, for example the population of a country, the height of geographical features or the algorithm of the Chinese multiplication method.

Based on our findings, the use of electronic material instead of textbooks or worksheets was worthwhile. Classic study materials turned out to be more suitable in paper form because of their better readability.

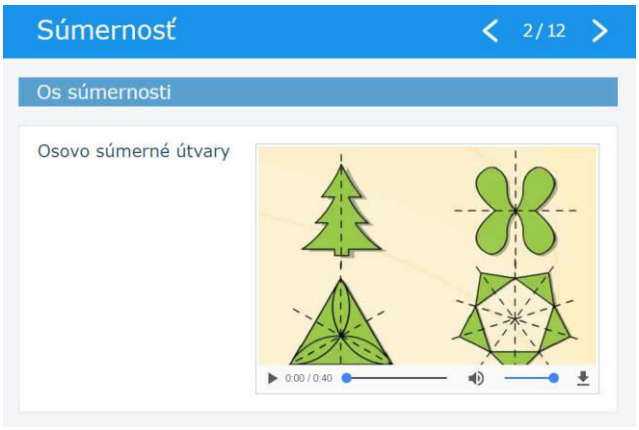
We had a few opportunities to use mobile phones as voting devices linked to an interactive table but with little success. The software we used was not sufficiently user-friendly, and after several unsuccessful attempts, the students lost the motivation to vote. This demonstrates the importance of using software that is tried and tested under school conditions.

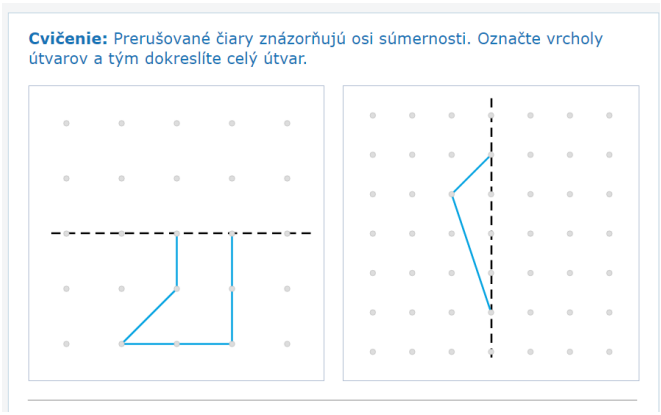
In the course of our research, we also used a number of mobile applications. The biggest problem the students encountered related to installing the applications at home, due to the fact that not all of the smartphones and tablets were compatible (because the students used their own mobile phones of different brands and with different operating systems and capacities).

We used the following applications:

Planéta vedomostí Available from this school year to all schools, students, teachers and parents this site http://planetavedomosti.iedu.sk/(Picture 1) contains a number of professionally made material for mathematics like videos, electronic worksheet and tests which are grouped together according to the curriculum topics for students and teachers alike. The content of this site covers a large part of both elementary and secondary school mathematics but also includes some topics beyond that. It is accessible on computers and interactive boards but sadly because of software incompatibilities it can't be used on tablets or smartphones.

PICTURE 1. PLANÉTA VEDOMOSTÍ



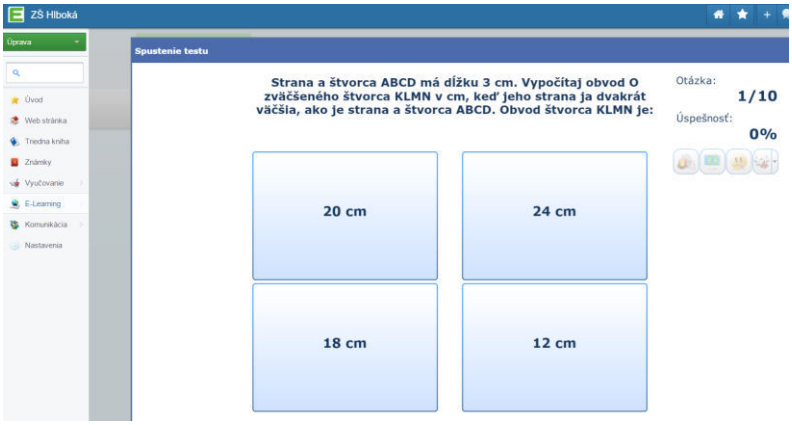


Source: http://planetavedomosti.iedu.sk/page.php/resources/view_all?id=muc_obraz_utvaru_obrazy_utvarov_os_osova_sumernost_osovo_sumerne_priamka_podla_suradnice_suradnicova_sustava_utvar

For improving the motivation of students, the teacher can use digital materials appropriate for interactive whiteboards. Websites and applets can be used as m-learning, therefore can be used on tablets or smartphones (individually or in pairs). We can find such a portal in Slovakia called Planéta vedomostí (Planet of knowledge). Teaching section called Zobrazenia (Symmetry) contains several nice activities about axial symmetry. The topic is introduced intuitively using a game with mirrors (Picture 2).

EduPage – http://edupage.org - is a professional site of ASC. Includes professionally produced tests which teachers can further edit (Picture 2).

PICTURE 2. EDUPAGE



Source: http://edupage.org

EAKTOVKA - http://www.eaktovka.sk – contains some of the currently used textbooks in mathematics for free.

Some of the websites of the teachers are also suitable collections of electronic materials. Websites that contains many fine "HotPotatoes" tests and other various materials for teachers of mathematics in elementary or secondary schools:

PaedDr. Katarína Poláčiková - http://www.supermatematika.wbl.sk/

RNDr. Marta Megyesiová - http://megym.wbl.sk/

RNDr. Erika Tomková . http://www.zsmalinovpart.edu.sk/matika/testy.htm

Kabinet matematiky ZŠ J. Alexyho Zvolen - http://matika.zsalexyhozv.sk/sk/hot_pot_testy

Some very nice "HotPotatoes" tests for primary schools can be found at the website of the Trnava University - http://vcv.truni.sk/tests.phpand interactive materials at the website of Pedagogical Faculty of Comenius Universityhttp://www.webmatika.sk/.

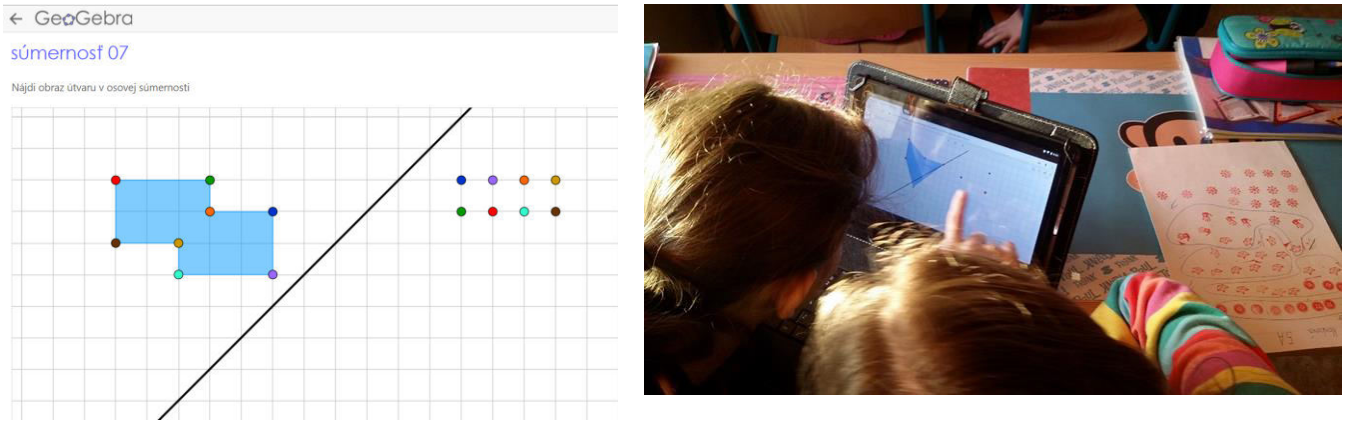
On the website of the national project "Modernising education in primary and secondary schools" is a so called Digital Library with lots of electronic material and their methodological description. They are categorized by the types of school, subjects and their use of ICT:

https://www.modernizaciavzdelavania.sk/Digi/DigiLibrary.aspx

The GeoGebra software was given a separate space. We used interactive applets that were accessible by means of a web browser at the GeoGeraTube portal. The GeoGera applets we created were used during

discussions related to Central and Axial Symmetry. Materials and applets for the GeoGebra software are on http://www.geogebratube.org(Picture 3).

PICTURE 3. GEOGEBRA

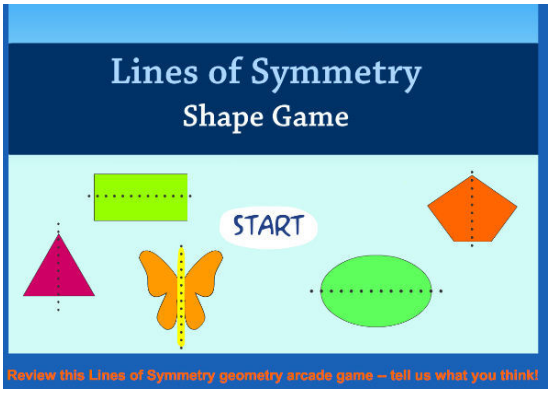


Source: https://www.geogebra.org/m/sxhCscUZ

We used the following applications:

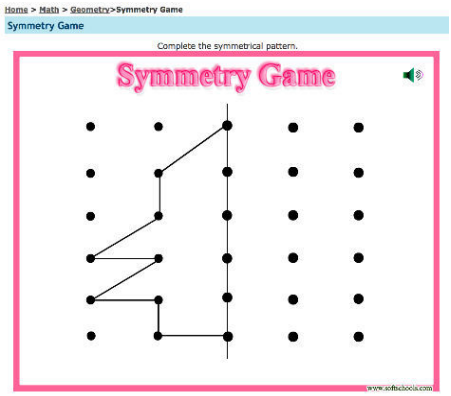
In the next part, we provide some links to web pages that are suitable as didactic games, where mostly the task of the student is to fill in the second part of the image, so that the image will be symmetrical, or the student has to place an axis in a manner that it would become the symmetry axis. The meaning of the word axial symmetry is introduced as a “mirror image” (Picture 4 to 6).

PICTURE 4. LINES OF SYMMETRY – SHAPE GAME



Source: http://www.sheppardsoftware.com/mathgames/geometry/shapeshoot/SymmetryLinesShapesShoot.htm

PICTURE 5. SYMMETRY GAME



Source: http://www.softschools.com/math/geometry/symmetry_game/

PICTURE 6. SAMMY´S SYMMETRY SHUFFLE

Source:http://www.fuelthebrain.com/games/sammys-symmetry-shuffle/

Augmented reality has been one of the most common and popular areas of virtual reality since 1992. In fact, it is a grade more advanced than virtual reality because it not only creates a new reality but also connects the existing environment to virtual elements. Augmented reality offers a wide range of applications regarding from the military through advertising to tourism to education and the entertainment industry. Mentioned for the first time by Tom Caudell in 1992, augmented reality is now especially popular among a large circle of young people, particularly because of the smartphone applications (Ferko 2012).

Ronald T. Azuma defines Augmented Reality as any system that has the following three characteristics:

1. Combines real and virtual,

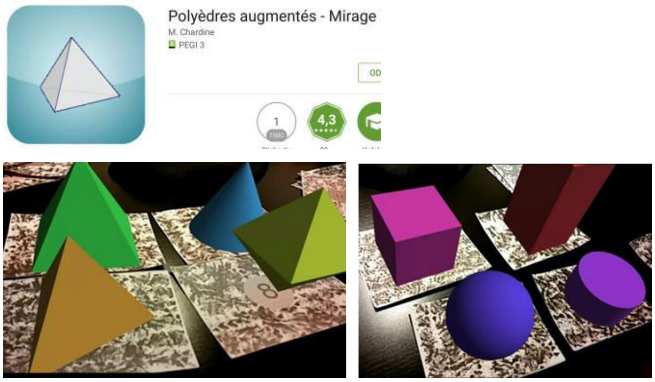
2. Is interactive in real time,

3. Is registered in three dimensions.

By augmenting the real world with virtual information, Augmented Reality provides new possibilities for education. The augmented reality application turned out to be a major motivation for the students. We used it to discuss the following topic: A cube, a block and 3D geometrical objects.

We used the applications *Polyèdres augmentés – Mirage* (Picture 7).

PICTURE 7. POLYÈDRES AUGMENTÉS – MIRAGE



Source: https://play.google.com/store/apps/details?id=com.miragestudio.polygons&hl=de

Research Results

Through the use of the open coding method and video-recording transcription, we defined three categories and their sub-categories which are summarized in the following table. The defined categories referred to constructionist teaching and the students´ manipulation activities. One of the categories is linked to learning and students´ mutual teaching.

After a thorough analysis of the text and a determination of thoughts, themes and phenomena by representative expressions, the categories of thoughts, themes and phenomena were defined. The categories we defined were given names expressing the best given group of related expressions. Having grouped and identified data in this way, we tried to understand and evaluate them from our perspective(Table 1).

1. Analysis of category No 1 – Mutual teaching with the help of constructivist approach

1.1. Sub-category No 1 – Students help each other

Through the transcription of the video-recordings and structured observations, we found that the students frequently helped each other. During all of the classes, they worked together. It is quite obvious that the pair work motivated them and that they enjoyed it. In most cases, they used the plural form when they talked to each other, which means that the students did not consider their tasks to be individual. When one of them had a problem, the other helped him/her with it. We did not observe any disagreements or disputes. It means that the constructivist environment established by us significantly helped the students in their work.

1.2. Sub-category No 2 – Mutual teaching helps the students to understand terms and relations

The cooperation of the students was quite clear. During the classes, they explored together, they determined interconnections and helped each other with understanding. When working in pairs, they also helped each other to understand. The pairs played well together, and when somebody had a problem,

his/her classmate was ready to explain and help. The biggest problem the students had in their first attempts was connected with the manipulation activities. During the classes, they talked to each other thanks to prompts from their teacher. They tried to agree on further procedures. We observed that students´ mutual teaching with the help of constructivist and constructionist approach was efficient.

1.3. Sub-category No 3 – Students do not cooperate with each other

We established this sub-category based on the fact that some students had to work in groups that were not based on their natural social links in the class. As a result, there were some pairs in which the students did not cooperate with each other due to a lack of natural social links. Unlike the other pairs, these students often used the word "I" instead of "We". If they failed, they blamed each other and/or gave up and stopped working. In such cases, the teachers had to intervene and motivate them.

TABLE 1

CATEGORY	SUB-CATEGORY	EXPRESSIONS
1. Students´ mutual teaching - constructionist approach	1. Students help each other	We are going to …, so that we can have, we will make, we have made, we have named, we have built, we are talking about, we are colouring, we are going to write, we are making a poster
	2. Mutual teaching helps them to understand terms and relations	We are creating together, to us, we will put, we are, let´s talk together, let´s take – so that we can, we are solving together
	3. They do not cooperate with each other	We were not able to explain it to each other, I am
2. Influence of mobile technology	1. It helps them when they can make several attempts thanks to the technology	Several tries, explanations, I have several attempts, several solutions, I can correct myself, with a simple click
	2. Mobile technology gives them feedback	We are verifying, she evaluated it on her own, so that it would be correct, I tried
	3. Thanks to mobile technology, they become aware of selected mathematical expressions and relations	We are thinking over, we are considering, we are thinking about, I can remember it
3. Manipulation activities	1. Discovery of new techniques	We are drawing, we are using a string, a ruler, polystyrene, a piece of twine, cubes, we are cutting out, we can see in the mirror
	2. Students are more motivated	We enjoy it, we are finding out, now we know, I am going to try it, we want to work
	3. Better awareness of mathematical expressions and relations	A square, a rectangular, a triangle, a cube, construction, a diagram, a table

Source: Own

2. Analysis of category No 2 – Influence of digital technology on teaching

2.1. Sub-category No 1 – It helps the students when they can try several times thanks to the technology

Most of the students were using tablets or smartphones as teaching aids for the first time, although they had used them before to send SMSs or play games. From the possibilities mentioned herein, constructionism, i.e., students´ mutual teaching, was present in the making of video-recordings. The

students were divided into small groups, and were given the task to make instructional video-recordings to be later presented by means of the interactive table. Their collaboration was positively reflected in these cases. When transcribing the video-recordings, we saw quite clearly that the students enjoyed solving the tasks of e-tests and electronic interactive materials, and they liked the possibility to correct their own mistakes and to be able to try several times to reach the correct result. Also during their common work, they encouraged each other by saying: "It doesn't matter if it's wrong now. We'll try again." Sometimes, they even repeated the task they had already solved correctly, simply because they enjoyed working with their tablets.

2.2. Sub-category No 2 – Mobile technology gives them feedback

In solving their e-tests, the students worked with the mobile applications independently. They communicated among themselves about what they had successfully done. When performing their tasks, they verified whether their understanding of new terms and relations was correct. This activity intrigued them so much that they worked with complete concentration and focus. There was no problem with discipline in spite of the active communication among them. They preferred working in pairs, while the students who worked on their own had a number of questions for the teacher.

2.3. Sub-category No 3 – Thanks to mobile technology, they become aware of selected mathematical expressions and relations

Based on the video-recordings and observations, it was quite clear that the students collaborated to solve their tasks; they explained some terms and relations to each other and they performed activities without any major interventions from the teacher.

3. Analysis of category No 3 – Manipulation activities

3.1. Sub-category No 1 – Discovery of new techniques

In terms of the categories we established, the category of the manipulation activities was the most extensive. The students immensely enjoyed the manipulation activities. It was again something new to them. In their communication, collaboration prevailed. They discussed throughout the duration of each activity and worked together to prepare the aids to be used. They particularly enjoyed the manipulation activities with the mirror, and cutting out symmetrical figures as part of the axial symmetry project.

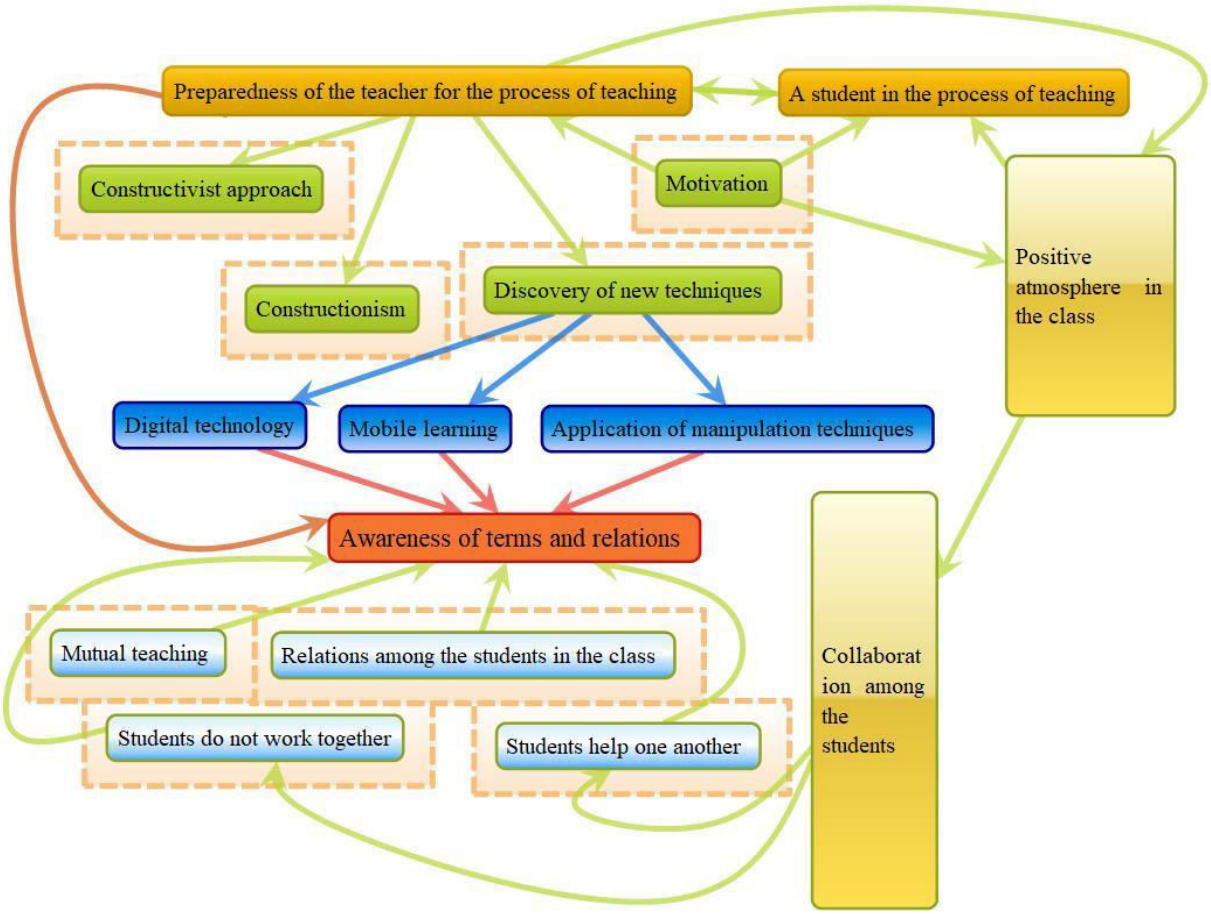
3.2. Sub-category No 2 – Students are more motivated in their work

Based on the transcription of the video-recordings, the students´ motivation was higher when they worked with new aids. These manipulation activities had a positive impact. They approached it as a game that allowed them to try new things. They worked together and helped each other. These are clear signs of collaboration during manipulation activities.

3.3. Sub-category No 3 – Better awareness of mathematical expressions and relations

In this sub-category, we analysed whether the students were able to better understand new terms and relations when manipulation activities were involved. Our analysis confirmed this to be true. The students "played" with their aids, and in this way, they learned from and taught each other. It is obvious that it is extremely important for the students to work with terms and to be able to clarify them by means of manipulation activities. Everything they can touch, try or handle is motivating for them. We came to the conclusion that manipulation activities helped the students to understand terms and relations.

PICTURE 8 CONCEPTUAL MAP



Source: Own

Interpretation of Research Results

In implementing, analysing and evaluating our research, we took into account our objectives and research questions that we had defined at the beginning. Therefore, during the course of our research, we focused on analysing the use of mobile technology and manipulation activities in the teaching of

mathematics to 10 and 11 year old students. Thanks to the consistent transcription and analysis of video-recordings and records of observation, we were able to answer our research questions.

Our first research question was: What are the advantages of m-learning in meeting the educational objectives in the teaching of mathematics to 10 and 11 year old students? Based on our long-term structured observation, we concluded that mobile learning increases students´ motivation to learn and to collaborate with their classmates. The students discover new terms, relations and interconnection on their own, and they are able to teach each other. Dividing the students into groups that do not disturb their positive social links in the class is a key factor for success. Clearly defining the rules for working with tablets and smartphones is also an important factor.

The second research question was: How do these advantages differ depending on the teaching methods (specifically the constructionist approach)? In the case of the constructivist and constructionist approach, the students spontaneously taught each other, they created educational video-recordings for their classmates, and presented and improved their information skills. In the case of activities such as practicing – solving tasks by means of e-tests and interactive materials, the students occasionally got distracted and started to do something on their mobile phones not related to the tasks (e.g., using Facebook or sending SMSs). In doing multiple choice e-tests, the students sometimes guessed the correct answer, instead of calculating. Based on these findings, we can state that mobile learning is of greater benefit in the teaching of mathematics when it is integrated in constructivist and constructionist teaching.

The third research question was: How do these advantages differ depending on the use of smartphones and tablets? Our findings show that each of the applied methods of using mobile technology has a positive impact. The students' creation of educational video-recordings and their presentations proved to be the most beneficial, while the self-study of electronic (albeit interactive) materials turned out to be the least motivating.

References

Arató, N., & Lavicza, Z., 2015. "The Hungarian Education System in Transition. In Do Teachers Wish to be Agents of Change?" SensePublishers. pp. 133-149.

Brown, T. H., 2005. "Towards a model for m-learning in Africa". International journal on ELearning, 4(3), p. 299.

Čavojský, I., 2012."Uplatnenie informačných a komunikačných technológií vo výučbe". Zborník MMK 2012, roč. 3, Hradec Králové, Magnanimitas, pp. 3276-3280

Chou, C. C., Block, L., & Jesness, R., 2012. "A case study of mobile learning pilot project in K-12 schools". Journal of Educational Technology Development and Exchange, 5 (2), 11-26.

Ferko, A., 2012. “Virtuálna realita v Bratislave”. Naša univerzita . Bratislava. Roč. 58, č. 6 (2012), p. 6

Chalmers, A., & Ferko, A., 2008. “Levels of realism: From virtual reality to real virtuality”. In Proceedings of the 24th Spring Conference on Computer Graphics, ACM, pp. 19-25.

Gee, J. P., 2003. “What video games have to teach us about learning and literacy”. Computers in Entertainment (CIE), 1(1), pp. 1-4.

Hohenwarter, M., Hedes, C., 2016.“Using quality factors to find "good" resources on the geogebra materials sharing platform”.Proceedings of the 15th International Conference WWW/Internet 2016, Mannheim; Germany, p. 229-232.

Hohenwarter, M., 2009.“GeoGebra: From auto design to computer font”.Informatik-Spektrum, Volume 32, Issue 1, p. 18-22.

Herendiné-Kónya, E., 2013.“A matematika tanítása alsó tagozaton”. Nemzedékek Tudása Tankönyvkiadó, Budapest.

Korenova, L. 2015. “What to use for mathematics in high school: PC, tablet or graphing calculator?”. The International Journal for Technology in Mathematics Education, 22(2), 59-65.

Koreňová, L. 2015. “Digitálne technológie v školskej matematike”. 1. vyd. Bratislava: KEC FMFI Univerzita Komenského.

Korenova, L. 2017. “Symmetry in elementary education with the use of digital technologies and manipulations”. In APLIMAT: 16th Conference on Applied Mathematics. Bratislava, Spektrum, pp. 836–845.

Kostrub, D. 2008. Dieťa/žiak/študent – učivo – učiteľ, didaktický alebo bermudský trojuholník? Prešov: ROKUS,

Kostrub, D. 2016. “Základy kvalitatívnej metodológie: keď interpretované významy znamenajú viac ako vysoké čísla”. Bratislava: Univerzita Komenského.

Kostrub, D. 2017. “3x meraj, potom rež, len si žiakov neporež! Interpretatívne skúmanie”. Interpretative Examination of Teaching Mathematics. In Pedagogická revue. 64 (1), pp. 103-124.

Melzer, A., Hadley, L., Winkler, T., & Herczeg, M., 2005. “Developing, Implementing, and Testing Mixed Reality and High Interaction Media Applications in Schools”. Proceedings of CELDA, pp. 123-130.

Melzer, A., Hadley, L., Glasemann, M., Werner, S., Winkler, T., & Herczeg, M., 2007. “Using iterative design and development for mobile learning systems in school projects”. Proceedings of ICEC CELDA, pp. 65-72.

Molnár, P., & Lukáč, S., 2015. “Dynamic Geometry Systems in Mathematics Education: Attitudes of Teachers”. International Journal of Information and Communication Technologies in Education, 4(4), pp. 19-33.

Osaďan, R. & Reid, E. 2016. “Recent migrants and education in the European Union”. In Compare- a journal of comparative and international education 46 (4), pp. 666-669.

Park, Y., 2011. “A pedagogical framework for mobile learning: Categorizing educational applications of mobile technologies into four types”. The International Review of Research in Open and Distributed Learning, 12(2), pp. 78-102.

Papert, S. & Harel, I. 1991. Constructionism. New York: Ablex Publishing Corporation.

Prodromou, T., Lavicza, Z., & Koren, B., 2015. “Increasing students' involvement in technology-supported mathematics lesson sequences”. The International Journal for Technology in Mathematics Education 22 (4), pp. 169-178.

Sharples, M., 2013. “Mobile learning: research, practice and challenges”. Distance Education in China 3(5), pp. 5-11.

Stoffová, V., Štrbo, M., 2016. “Educational technologies to support language teaching”. Proceedings of XXIX. DidMatTech 2016, Eötvös Loránd Tudományegyetem, Budapest, 2016.

Taylor, J., Sharples, M., O'Malley, C., Vavoula, G., & Waycott, J., 2006. “Towards a task model for mobile learning: a dialectical approach”. International Journal of Learning Technology 2 (2-3), pp.138-158.

Traxler, J., 2009. “Learning in a mobile age”. International Journal of Mobile and Blended Learning (IJMBL) 1(1), pp. 1-12.

Turek, I., 2014. 2014. Didaktika. Wolters Kluwer, Bratislava.

Wintsche, G., 2014. “Egy kísérlet nem kísérlet. A játéktól a kutatásig”. Budapest, Varga Tamás Tanítványainak Emlékalapítványa, 2014, pp. 90-93.

Weigand, H.-G., 2014. “Looking back and ahead-didactical implications for the use of digital technologies in the next decade”. Teaching Mathematics and its Applications Volume 33, Issue 1, March 2014, pp. 3-15.

DIGITAL SUSTAINABILITY REPORTING IN THE ERA OF KNOWLEDGE SOCIETY

ŠTĚPÁNKA HRONOVÁ

Faculty of Business Administration
University of Economics in Prague, Czech Republic

e-mail of corresponding author: hros00@vse.cz, stepa_00@yahoo.com

Key words: corporate communication, digital platform, education, knowledge society, sustainability and CSR reporting.

Abstract: Educating and informing corporate stakeholders and general public about sustainable activities of companies is currently gaining on its importance in the new information age. Worldwide as well as in the Czech Republic B2B customers closely monitor responsible corporate behaviour of their suppliers. Dissemination of information and spreading the knowledge about responsible activities of a company via corporate websites can contribute to its positive image on domestic as well as international markets. Social and environmental pillars of sustainability may boost the competitive edge of a business entity and that is one of the reasons companies educate and inform their customers and clients as well as general public about their responsible activities and the issue in general either in a form of an electronic article/post or a separate CSR/sustainability report. This paper deals with corporate communication focusing on the e-platform. It analyses data and brings findings of a research carried out on a sample of 46 companies in the Czech Republic within the pilot section of a larger project called Sustainable Corporate Responsibility. In particular, the paper examines forms in which a company reveals information on its CSR activities to its external and internal public and the topic of sustainability as a whole on the corporate websites thus helping to build the knowledge society. The objective is to find out how companies educate and inform all stakeholders inclusive of general public about their sustainable activities via the electronic platform.

Introduction

This paper draws attention to a topic of sustainable activities (corporate social responsibility – CSR) of companies and their communication about this issue towards their internal as well as external stakeholders via an e-platform (reporting). Based on the Global Reporting Initiative's (GRI) definition, the author is bringing forward the term *sustainable/CSR report*. GRI describes it as: *"a report published by a company or organization about the economic, environmental and social impacts caused by its everyday activities* (Global Reporting 2017). Such a report introduces the organization's governance model and its values; it also informs all stakeholders about the link between its strategy and its commitment to a sustainable global economy.

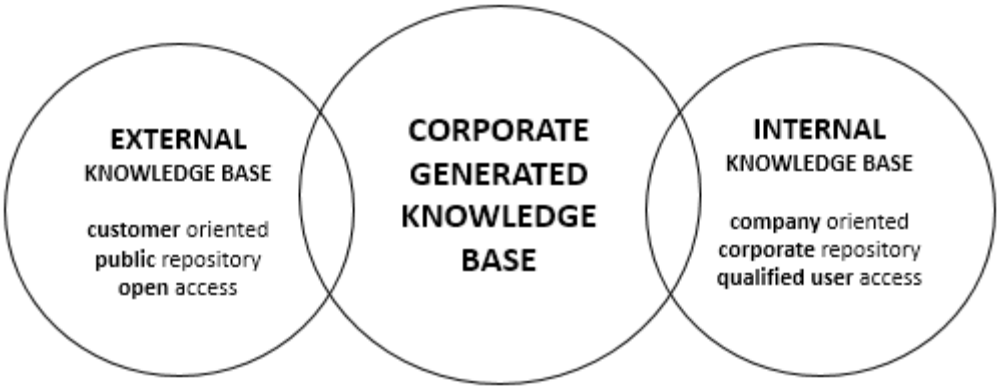
Comprehensive communication about responsible activities creates a prerequisite for effective implementation of CSR into corporate practice. Companies in EU with over 500 employees have a duty to publish a CSR/ sustainability report starting from 2017 based on the EU's mandatory directive 2014/95/EU. CSR reporting of smaller business entities will remain voluntary. Companies are increasingly trying to spread knowledge and educate their potential or existing customers about their good cause ad hoc activities but to a larger extend smart firms focus on a set of planned activities (Porter & Krammer 2011) subsidizing local community or society as a whole. These optional activities, contributing broadly and positively to society and involving business strategies and practices adopted by firms, go beyond regulatory requirements. Such behavior is also called *proactive CSR* in literature (Torugsa et al 2012).

Author of this paper focuses on types of communication on CSR business activities and sustainability reports disseminating the information via electronic media. The purpose of the work is to uncover the ways and intensity of such information spread and knowledge-building among firms in the Czech business environment. Topicality of the issue is given by the fact that starting this year, the above mentioned

reporting is going to be obligatory for large companies but may bring a competitive advantage to SMEs as well.

The speed of changes in technological advancement as well as development in every business sector bring an instant need to educate internal as well as external publics of companies. In the era of knowledge society, it can be done both, individually as well as collectively, on the basis of building a knowledge base. The publicly available data and information about CSR/sustainable activities contribute to building such an external knowledge base. A scheme (Pic.1) of the *Corporate generated knowledge base* can be seen below showing two sides of one coin: the complex process of external sharing within a public repository and internal exchange and keeping information within a corporate repository with a common interconnection and obvious overlapping between these platforms. (Knihová & Hronová 2016)

PICTURE 1. CORPORATE GENERATED KNOWLEDGE BASE SCHEME



Source: Knihová & Hronová (2016) presented at the conference Human Capital and Investment in Education 2016.

Prevailingly, companies exploit their core competencies and knowledge base in order to design the competitive position and business strategies capitalizing on corporate strengths. Keeping up with the speed of technological advancement, they frequently use the most break-through technologies so as to stay competitive. *"The world is increasingly a vast electronic entrepot, where broadband communications and optical technology hold the key to economic growth trade and development"* (Martin 1995, 33). However, firms may also utilize their strength and know-how to help local communities or the environment by various sustainable activities and by sharing the gained knowledge. The most reliable way for such sharing as well as for informing about their events and long-term activities is through an e-platform accessible via computers but also via many other communication devices including tablets and smartphones.

At the end of this introductory chapter, a short overview of the coming parts of the paper is presented to shed light on the examined issues. In Section A, the paper introduces the research that aims at revealing the situation on the topic of sharing information about sustainable activities among firms and authorities in the Czech Republic (CR). It describes methods and a sample. Section B brings forward the findings and Section C shows particular examples of how companies use electronic platform to communicate about

their CSR/Sustainable activities and thus educate general public and other stakeholders. Finally, conclusion brings a short summary, an evaluation and an outlook for the future possible research.

Primary data analysis

An analysis of primary data about sustainability reporting is brought by the author in the section. Results of a pilot sample-based survey conducted via self-administered electronic questionnaires are further revealed. The sample is made by 46 companies (micro businesses, SMEs, large businesses in the CR) which completed and returned the e-questionnaires by the deadline of this article. This research probe was a requisite initial step to a wider research within the project called *Sustainable Corporate Responsibility* carried by a team of researchers from the University of Economics, Prague.

The paper wants to find an answer to the following questions. How and to what extend do companies in the CR reveal information on their CSR activities to their external and internal stakeholders and by doing so how do they contribute to building an external knowledge base? What forms of sustainability reporting are used (annual general reports, online press releases, or ad hoc CSR/ sustainability reports)? Is there any connection between the size of a firm and their reporting activities? For the given variables, graphical representations were worked out and calculations of medians, averages and modus figures are further provided as well as the Chi-square statistic. In this section, two parts of a complex questionnaire are presented to the readers (Pictures 2 and 3). For the purposes of the research among Czech companies, they were originally compiled in Czech.

PICTURE 2. QUESTIONNAIRE – GENERAL INFORMATION ABOUT COMPANIES

Questionnaire - Sustainable Corporate Responsibility - IP 304026 KPO

Legal form of business		Majority Owner		Number of employees	
Self-employed	☐	Foreign	☐	0 to 9	☐
Limited liability company	☐	Czech private	☐	10 to 49	☐
Joint stock company	☐	Czech state	☐	50 to 249	☐
General partnership	☐			250 to 499	☐
Limited partnership	☐			500 +	☐
European company	☐				
State enterprise	☐				
Other	☐				

Main area of business – CZ-NACE code

Agriculture, forestry and fishery	☐	Transport and warehousing	☐	Public administration and defence; Compulsory social security	☐
Mining and quarrying	☐	Information and communication activities	☐	Education	☐
Processing industry	☐	Accommodation, catering and hospitality	☐	Health and social care	☐
Production and distribution of electricity, gas, heat and air conditioning	☐	Finance and insurance	☐	Cultural, entertainment and leisure activities	☐
Water supply; Activities related to waste water, drainage and sanitation	☐	Real estate activities	☐	Other activities	☐
Construction	☐	Professional, scientific and technical activities	☐	Activities of households as employers; Activities of households producing unidentified products and services for their own use	☐
Wholesale and retail trade; Repair and maintenance of motor vehicles	☐	Administrative and support activities	☐	Activities of exterritorial organizations and bodies	☐

Source: Own

PICTURE 3. QUESTIONNAIRE – SUSTAINABLE CORPORATE RESPONSIBILITY: EXTENT AND FORMS OF REPORTING

Questionnaire - Sustainable Corporate Responsibility - IP 304026

KPO

	What is the extent of your CSR reporting? (from 1 = "no focus on this issue" 5 ="high importance/company has a leading role")				
Information about CSR activities published in Annual Reports.	1 - ☐	2 - ☐	3 - ☐	4 - ☐	5 - ☐
Information about CSR activities published on the corporate website.	1 - ☐	2 - ☐	3 - ☐	4 - ☐	5 - ☐
Information about CSR activities published in separate CSR reports.	1 - ☐	2 - ☐	3 - ☐	4 - ☐	5 - ☐

Source: Own

Results of researcgh

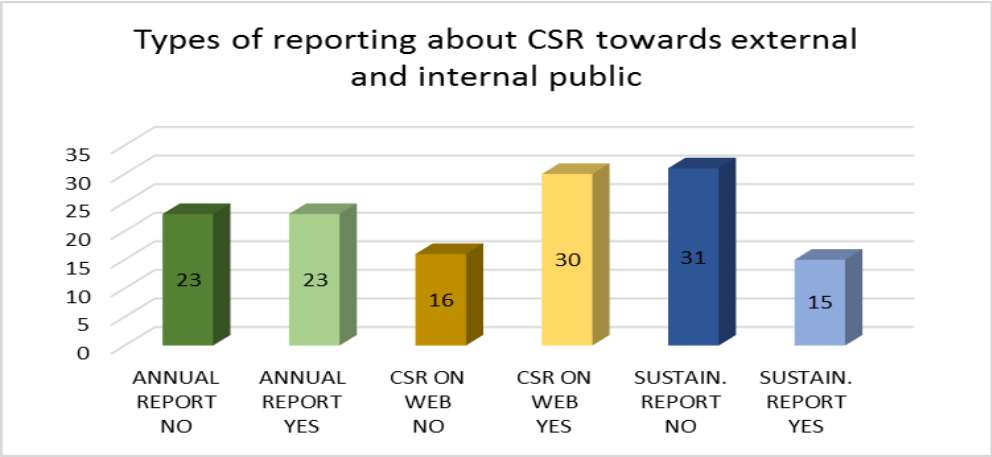
The text further reveals results of the pilot part of the ongoing complex research into reporting about sustainable activities of firms in the Czech Republic. The data is still being collected; the overall analysis should have been finished by the end of 2017.

The 46 respondents in the sample ranked from the following forms of business: 6 self-employed, 29 Ltd., 8 joint stock, 2 public, 1 state enterprise; there were no limited partnership and European companies involved. Nobody checked the option *other* for the legal form of business.

Concerning the core business, the calculated modus showed a figure *19* representing option *other.* The following most frequently checked options were: *information and communication activities*, *processing and manufacturing,* and *wholesale and retail*.

Looking at the type of sustainability/ CSR reporting, the prevailing part – 30 companies (65%) – claimed that they inform about their activities via *corporate websites*. 23 institutions spread CSR information with the use of *annual reports*. The lowest represented possibility was a separate *CSR/ sustainability report* where 15 companies claimed they use this particular form. In the three categories, on average, about 50 percent stated that they do not provide some of the proposed types of non-financial reporting (Graph 1).

GRAPH 1. CSR/ SUSTAINABILITY REPORTING IN CR BASED ON THE SAMPLE (IN NUMBERS OF COMPANIES)



Source: Own

It was further checked if the type of reporting depends strongly on the size of the company. In other words, the author wanted to uncover whether the following variables are dependent or independent:

a company size and a type of reporting. A Chi-square test for the types of reporting and different sizes of companies was run. The calculated chi-square statistic is 4.0704. The results for pairs of variables is presented below (Tab. 1), the *p*-value is 0.667. The calculations show that at $p < 0.05$ the result is not significant which indicates that the type of reporting and size of company are independent variables for this particular pilot sample of companies.

TABLE 1. CHI-SQUARE FOR COMPANY SIZE AND TYPE OF REPORTING

	0-9 employees	**10-49 employees**	**50-249 employees**	**500+ employees**	**ROW TOTALS**
Annual report	4 (4.74) [0.11]	4 (4.40) [0.04]	5 (4.40) [0.08]	10 (9.47) [0.03]	23
Separ. CSR rep.	1 (3.09) [1.41]	3 (2.87) [0.01]	3 (2.87) [0.01]	8 (6.18) [0.54]	15
Info on web	9 (6.18) [1.29]	6 (5.74) [0.01]	5 (5.74) [0.09]	10 (12.35) [0.45	30
COLUMN TOTAL	**14**	**13**	**13**	**28**	**68 GRAND TOTAL**
Chi-square statistic = 4.0704, p < 0.05, p-value = 0.667					

Source: Own

Averages were also calculated for the individual types of reporting so as to find extent to which companies report and how strong they feel compared to their competitors on the scale from 1 to 5 (with 1 meaning no involvement and 5 the highest involvement). On average, companies evaluated themselves in the following way: *annual report* 3.5, *website* 3.2 and *sustainability report* 3.4 on a five point scale. It can be claimed that the companies which inform stakeholders about their sustainable activities felt most involved in incorporating the CSR section into their *annual reports*. It could have been caused by the fact that presenting the CSR information on the website is quite usual nowadays; however, incorporating the CSR section into annual reports is a novelty for some companies and therefore employees might feel more strongly engage in compiling such a document as it may be more demanding.

CSR aproach

The above research showed that a prevailing part of companies regardless their size publishes CSR information and thus spread the knowledge about the company's sustainability on corporate websites. Below (Pic. 4), a few particular examples can be seen of how companies spread information about their sustainable activities and share knowledge with all stakeholders on an electronic platform thus contributing to building the above mentioned *external knowledge base*.

PICTURE 4. INFORMATION ABOUT SUSTAINABLE/CSR ACTIVITIES ON CORPORATE WEBSITES

Sources: available from http://www.mattoni.cz/styl-mattoni/ekologie, http://www.heinekenceskarepublika.cz/zprava-o-udrzitelnosti?age=more, http://www.paletky.cz/palety-z-cedru/

Increasingly, people approach the internet using various electronic gadgets with smartphones gaining on their intensity of use. People spend hours on-line and can easily be reached if they are offered interesting content. Companies can even create engaging activities so that external public can be hooked and might join this corporate-created entertaining or external public involving unit. Worldwide, socially responsible mobile apps exist to encourage general public to behave in a certain manner: to become more eco-friendly or more socially-aware. Here are a few examples: Apps For Good, SpillMap, Catalista, SeeClickFix, Eco Hero, GoodGuide, CauseWorld, Give Work, and others (Woyke 2010).

These modern approaches to communicating CSR on mobile apps are taken not only by the not-for-profit organizations but also by for-profit entities. The mobile app *EPP - Pomáhej pohybem* by the Czech Power Company ČEZ could be named as an example of a local innovative approach to involving public and helping a good cause and the Czech society at the same time (Bačuvčík,2016).

Conclusion

The treatise focused on a topic of corporate sustainable activities communicated via e-platforms in the era of knowledge society. The research showed that most companies inform about their CSR activities on their websites, however, companies feel more engaged in creating an annual report, followed by a CSR report which might be caused by their novelty and an increased effort during their compilation. The Chi-square test run for the given sample showed independence between the two variables: the company size and the type of report. The pilot questionnaire proved satisfactory for the full research; the sample needs to be broadened to at least 100 companies in order to provide a sample with higher reporting value. Examples of electronic communication via websites towards external public thus building an external knowledge base were presented as well as mobile apps which support sustainability. The research intended to monitor the current situation as well as spread information among companies about ethical and sustainable corporate behavior, thus, to a certain extent, educate the external public about the issue.

For the future, it can be predicted that an appearance of separate CSR/sustainability reports' use is going to be on the rise connected with the upcoming reporting duty for companies 500+ based on the EU's mandatory directive 2014/95/EU.

A further research can be proposed, for example, a comparative analysis for the set of 2017 data and the future collected sample to see whether there is any impact on SMEs caused by the compulsory reporting of large companies.

Acknowledgment

This paper has been prepared as a part of the project "IGA2 VŠE Sustainable Corporate Responsibility (SCR) - IP 304026".

References

Bačuvčík, R., 2016. Kreativita a efektivita v marketingové komunikaci. Czech Republic. Zlín.

Global Reporting, 2017. "About Sustainability Reporting", http://www.globalreporting.org/information/sustainability-reporting/Pages/default.aspx, accessed on 20th March 2017.

Heineken Česká republika. 2016. "Zpráva o udržitelnosti 2015", http://www.heinekenceskarepublika.cz/zprava-o-udrzitelnosti?age=more, accessed on 8th May 2017.

Martin, W. J., 1995. The global information society. United Kingdom, Aslib Gower.

Mattoni, 2017. "Ekologie", http://www.mattoni.cz/styl-mattoni/ekologie, accessed on 8th May 2017.

Knihová, L., Hronová, Š., 2016. "The Role of Cognition and Human Capital in Organizations", Human Capital and Investment in Education.

Paletky.cz, 2017. "Palety z cedru", http://www.paletky.cz/palety-z-cedru/, accessed on 10th May 2017.

Porter, M. E., Krammer, M.R., 2011. Harvard Business Review. "Creating shared value", https://hbr.org/2011/01/the-big-idea-creating-shared-value, accessed on 10th May 2017.

Torugsa, N. A., O'Donohue, W., Hecker, R. 2012. "Capabilities, Proactive CSR and Financial Performance in SMEs: Empirical Evidence from an Australian Manufacturing Industry Sector", Journal of Business Ethics, 109 (4), pp. 483–500.

Woyke, E., 2010. "From Smartphones to Tablets, Ten Socially Responsible Mobile Apps", https://www.forbes.com/2010/07/12/iphone-android-blackberry-technology-mobile-apps_slide.html, accessed on 10th May 2017.

BUSINESS MODELS OF MOOCS IN 2017

ALEXANDRA HRUŠKOVÁ

Faculty of Education
University of West Bohemia, Czech Republic

e-mail of corresponding author: hruskova@kvd.zcu.cz

Key words: massive open online courses, MOOC, MOOC platforms, business models, online education.

Abstract: The main objective of Massive Open Online Courses (MOOCs) is to provide educational content of high quality to a large number of participants via the Internet; to enable the mutual interaction through the providing platform, and to allow those participants to study the course independently in time. The educational content in every MOOC is provided free of charge. The increasing influence of MOOCs within adult education (higher education) brings to this area more educational organizations with different legal statuses and different types of commercial focus. Within the production of MOOCs, other additional services are provided to bring revenue to cover the costs of MOOC to the provider. Existing MOOC platforms are still at an early stage of development. Universities, non-profit organizations, and also business companies all around the world adapt different types of business models to provide MOOCs to the general public. This paper focuses on the existing types of business models of the world's four largest providers of MOOCs in the USA and Europe. Based on the current research about the business models of the worldwide leading MOOC platforms, this paper presents a list of possible revenues from MOOC platforms, along with recommendations for the implementation of the business model of MOOCs in the Czech Republic.

Introduction

Massive Online Open Courses, or MOOCs, represent a modern concept for online education. The main idea is to allow quality education, free of charge, anytime and for everyone.

MOOCs are offered mainly by universities all around the world, in high quality, and free of charge to a large number of participants via the internet. These participants can choose for themselves the time of their own studies. The MOOC platform, at the same time, allows participants to interact with each other. These massive open online educational services are provided free of charge. However, the creation, provision, and even reselling of MOOCs bring costs which need to be covered. That's why business models of MOOCs have been under discussion for several years. The influence of MOOCs in adult education is growing; new educational and other institutions with different types of financial management are interested in creating, providing, and reselling MOOCs. MOOC providers offer other commercial services associated with courses, use grant options, and use other options to cover the costs.

The model that grows the fastest, as we have seen in recent years on the Internet, is when content is free and you monetize various things connected with it (Vuchic, Tirthali 2014). Freemium business models depend on the money that is generated from additional services to be paid for additions to the basic product - the service offered for free (BizMOOC 2017).

Based on recent Business Models of MOOC research, this paper focuses on the possible revenue of MOOC (Massive Open Online Courses) platforms. The aim of this paper is to describe possibilities of revenue from MOOC platforms in the US and Europe, and recommend their implementation in the Czech system of higher education.

Methods

The final list of possible revenues of MOOC producers in this paper is based on current research in MOOC Business Models. This review study lists the revenues of the four MOOC platforms, the survey includes the US (international - Coursera, Udacity, edX) and European (iversity) platforms. The main focus is on the composition of their revenue, sources of research data are available on the websites of the platforms mentioned above.

Although the implementation of possible business models differs in the US and Europe, these differences bring more challenges for the future MOOC platforms, especially in Europe. Venture capital financing takes place mainly in the US educational system. Public authority funding is rather more common in Europe, either by the government (e.g. by ministries for science and/or education) or by academia itself (Fischer et al 2014).

The outcome of this study is a list of possible revenues from MOOCs, based on the most common business models for MOOCs in the US and Europe, and recommendations for possible revenues from MOOC platforms in the Czech education system. One of the possible outputs of this study can also be that not all of the income opportunities identified in this paper may be implemented in the Czech education system.

Fragmentation of the education providing process

More stakeholders, organizations, and individuals can be involved in the process of creating and providing MOOCs. Each stage of the process can be created or provided by a different organization. This leads to variability in MOOC development, and to the fragmentation of the education providing process, it can also bring new ideas for paid additional services, and also help to ensure a sustainable business model.

As an increasing number of stakeholders get involved in the creation of MOOCs, there might be a trend of greater diversification of the services around and beyond the MOOC itself (Fischer et al 2014). MOOC providers in the USA are experimenting with different sources of income, including proctored exams leading to special certificates and credits, fees for individual tutoring, and selling contact data of successful attendees to enterprises (BizMOOC 2017).

Business model

The basic concept of creating, transferring, and gaining value in an organization tells us what kind of business model the organization chooses. Al-Debei, El-Haddadeh, and Avison (2008) indicate a business model with the following three values: the value of architecture (organizational infrastructure and technology that moves products, services and information), financial value (total cost of ownership, income) and the value of the external network. A business model is a theoretical concept for commercial

companies [6]. For MOOC providers, it is important to find or create a suitable business model for nonprofits, government, or other types of organization.

Worldwide providers of MOOCs

Coursera provides a large number of free courses, and holds a partnership with a large number of universities. Most MOOCs are offered individually. Ten educational programs based on connected MOOCs on Coursera are integrated in study programs and academic courses. The earnings structure of Coursera is mainly oriented on other commercial services associated with the courses. Udacity uses a Freemium model. Part of the course content is available free of charge, full access to course materials and certification is based upon a subscription fee. Udacity partners with the Georgia Institute of Technology and AT&T, and focuses on the IT market. The corporate oriented strategy uses MOOCs as the gap between working skills, education, and employment. The revenue streams of Udacity are based on course charges and earnings for its technologies. edX is a non-profit MOOC provider; it was founded and is partially governed by MIT and Harvard. Its vision is to provide open education for everyone, all around the world. Providing the Open edX (open-source for MOOCs) is the world's most important contributor to the development and expansion of MOOCs. iversity integrates MOOCs into academic blended learning in co-operation with universities, and also focuses on chargeable courses.

Revenue structure of Coursera

The establishment of Coursera was funded by capital investors. The total equity of funding as of May 2017 is $146.1M, in 6 rounds of funding, from 13 investors (Crunchbase). The source of revenue from course participants is for the beginning of sale of verified certificates. A further source of income from course participants are the fee-based course options (verified credentials for completion), and the fees to earn grades and assessments. Some courses have the option to pay a fee to join the Signature Track, which includes identity verification, verified certificates, and sharable course records. Another type of earnings is the monthly subscription model for Specializations, which allows the user to purchase access to all content in a Specialization on a month-by-month or annual basis. These sources of revenue come from the participants of courses. In addition to funding and commercial services associated with the courses, there are other new services that generate profits: the Coursera for Business program (additional revenues from the corporate e-learning market) and the Coursera for Governments & Nonprofits program (skills-based training for constituents in government and NGOs). On the other hand, the company offers financial aid to people who demonstrate a need (Coursera Refugees Program). This information was obtained through a detailed exploration of the service offer on the company's website.

Revenue structure of Udacity

Udacity is funded by venture capital firms, in addition to $200,000 of personal money. [8] Further revenue comes from the participants of the courses. This includes Freemium courses and paid self-paced courses. Other earnings come from tuition fees for 3 credit hour courses, and additional proctored 75-minute final exams for a fee of $89. Since 2014, a three-year master's degree (called nanodegree) in computer science that can be earned entirely online for $7,000 (Wikipedia1) has been offered. The company increased the number of enrolments by offering a refund of 50% of the total charges for those who successfully complete their course within 12 months. Another source of revenue comes from Corporate Training. Udacity offers talents to hire for free. This information was obtained through a detailed exploration of the service offer on the company's website.

Revenue structure of edX

The largest volume is represented by free courses with chargeable additional services: Verified Certificate, Earn Credit course, or Audit. Another part of the profit brings Paid Professional education, Professional Certificates, XSeries (series of 5 - 7 chargeable courses, $49 per course), and the MicroMasters Certificate (credit - eligible, may be applied to accelerate a Master's Degree). edX is empowering research on pedagogy; the platform conducts experiments and exploration of using new tools and techniques for learning. This information was obtained through a detailed exploration of the service offer on the company's website.

Revenue structure of iversity

Iversity funding is based on venture capital; the company has raised more than €5 million in venture capital (Wikipedia1). The revenue consists of the sale of verified certificates of free MOOCs, the sale of the Pro - courses with a Statement of Participation. iversity generates revenue through its Academy, which allows other organizations to sell courses online on this platform. The last two items belong in the section iversity for Business. This information was obtained through a detailed exploration of the service offer on the company's website.

TABLE 1. REVENUE OPTIONS OF MOOC PLATFORM STARTUPS	
Startup funding	Private investors (venture, equity, personal money) Public investors (foundations, subsidies) Grants
Chargeable additional services associated with free MOOCs	Verified certificates Fee-based course options Verified credentials for completion Fees to earn grades and assessment Identity verification Shareable course records Proctored final exams
Chargeable MOOCs	Monthly subscription model Tuition fees Freemium courses Credit-eligible courses Paid self-paced courses University Degree program (NanoDegree, MicroMaster) Work toward Verified Certificate Courses in series leading to Certificates
MOOCs for Business companies	Corporate e-learning Program for Governments & Nonprofits Corporate Training Professional Education courses Licensing MOOC for internal use at enterprises or universities Recruiting based on tracking students' activities and study results
Other	Contributions from sponsors Advertising revenue Fees for the creation and deployment of MOOCs Link to partner bookstores
Source: Own	

Results

The revenue structure reflects the overall focus of the platform, its specialization on the target group, and its position on the market. All of the platform start-ups were backed by initial capital. The business model of the platforms reflects their market specialization. They gradually add additional products to the basic product package, and extend their reach to other target groups over time. All of the platforms under review currently provide free or partially free MOOCs with additional chargeable services, paid MOOCs, and Business oriented MOOCs for companies, which are able to generate steady income. These revenues are summarized in Table 1.

Conclusion

The emergence of a new platform should be laid on solid foundations and previous analyses. The establishing of a MOOC platform provider needs a reasonable amount of private capital (equity, venture) or public capital (foundations, grants), which is mainly used for the establishment of the technical infrastructure, partnership with universities, and the market position. The MOOC provider prepares a basic product package according to the desired market position. Those basic products should make a profit (e.g. chargeable verified certificates). Further development and targeting for other customers follow the

successful introduction of the core products.

The system of primary, secondary, and higher education in Czech Republic is governed by the Ministry of Education, and funded by public sources. Establishing and linking the MOOC platform to Czech academic education presumes the involvement of the state organizations in the preparation of this platform. Initial sources of funding may therefore come from public finances, such as subsidies from the state budget or EU grants. An important point for the Czech MOOC platform will be the choice of an appropriate market position, the partnership with universities, and the creation of a basic package of products. One of the issues remaining for further discussion is the issue of MOOCs in English and other languages in the Czech platform, and links with global platforms of MOOCs.

References

Al-Debei, M. M., & Avison, D., 2010. "Developing a unified framework of the business model concept". European Journal of Information Systems, 19 (3), pp. 359-376

BizMOOC Discussion paper 07 Existing MOOC business models, 2017, 14, https://www.researchgate.net/publication/314950632_BizMOOC_Discussion_paper_07_Existing_MOOC_business_models, accessed on 1st May, 2017.

Crunchbase, Coursera, https://www.crunchbase.com/organization/coursera#/entity, accessed on 9th May, 2017.

Fischer, H., Dreisiebner, S., Franken, O, Ebner, M., Kopp, M. Köhler, T. 2014. "Revenue vs. Costs of MOOC Platforms. Discussion of Business Models for XMOOC Providers Based on Empirical Findings and Experiences during Implementation of the Project IMOOX", ICERI2014 Proceedings, 7th International Conference of Education, Research and Innovation, Seville (Spain) 17-19 November, 2014, pp. 2991-3000.

Vuchic, F., Tirthali, D., 2014, MOOCs: Expectations and Reality, 85, http://cbcse.org/wordpress/wp-content/uploads/2014/05/MOOCs_Expectations_and_Reality.pdf, accessed on 1st May, 2017.

Wikipedia 1, Udacity, https://en.wikipedia.org/wiki/Udacity, accessed on 9th May, 2017.

Wikipedia 2, iversity, https://en.wikipedia.org/wiki/Iversity, accessed on 9th May, 2017.

PRE-SERVICE TEACHERS AND TECHNOLOGY ENHANCED SCHOOL PROJECTS

ZBYNĚK FILIPI, LUCIE ROHLÍKOVÁ

Faculty of Education,
University of West Bohemia, Pilsen, Czech Republic

e-mail of corresponding author: lrohlik@kvd.zcu.cz

Key words: active learning, higher education, technology enhanced learning, pre-service teachers.

Abstract: This paper presents innovative approaches to active learning that were introduced to the teaching of pre-service teachers at the Faculty of Education of University of West Bohemia, Pilsen, the Czech Republic. Over the last three years, the Technology Enhanced Learning course has seen substantial innovations in both content and the use of teaching strategies designed to prepare the pre-service teachers for their professional life. The whole update of the course was implemented using the results of action research – all individual changes were rigorously tracked and analysed. A significant part of the teaching consists of co-operative projects between pre-service teachers and pupils of primary schools.

In 2015/2016, pre-service teachers in pairs prepared several stations on which pupils fundamentally worked with Google Cardboard. Implementation of the project within the school was preceded by acquainting the pre-service teachers with Google Cardboard, research, and suitable applications. One pair of pre-service teachers prepared an initial brief presentation on virtual reality, and another pair divided up which applications pupils would work with at their stations, thought up tasked activities for the stations, and created worksheets for the pupils. The actual teaching then took place at an elementary school the science club. The children divided into groups passed from station to station, and performed the tasks with the assistance of the pre-service teachers.

In 2016/2017, the theme of digital storytelling was chosen as the project. School teams were created, and each team was assigned a pre-service teacher. Each team drew one point from the Decalogue of Internet Safety (e.g. Do not give anyone an address or phone number, as you don't know who is hiding behind the monitor.), and the team's task was to portray this point as a digital story, using Lego and Stop Motion applications on the tablet.

Description of activities and explanation of the reasons for their inclusion in teaching in the text is supplemented by relevant feedback from pre-service teachers that we have gained through pre-service teachers filling out questionnaires at the end of the course or at the conclusion of each activity.

Introduction

Field experiences are a necessary and beneficial component of teacher education programmes (Everling, Dellelo, Dykes, Neel and Hansen 2015). The challenge for teacher preparation programmes is to ensure that graduating pre-service teachers have the knowledge and skills to be effective teachers from the first day of employment, and that they remain in the profession (Casey, Dunlap, Brister, Davidson and Martin 2011). Pre-service teachers are expected to transfer knowledge and skills in technology enhanced learning to their future classrooms (Brush et al. 2003).

Research has shown that supervised field experiences have positively affected the knowledge and skills of pre-service teachers (O'Brien, Stoner, Appel and House 2007; Sears, Cavallaro and Hall 2004; Whitney, Golez, Nagel and Nieto 2002). Prater and Sileo (2002) point out that extended field experiences have afforded additional opportunities for pre-service teachers to raise questions about current practices, and to further explore teaching and learning strategies, while applying them to real-life situations. In addition, Hodge and Jansma (1997) emphasize that courses with practical experience have a greater impact on pre-service teachers' attitudes than coursework alone.

Pre-service teachers' preparation in the integration of technology could be aligned closely with pedagogical issues and curriculum integration (Agyei and Voogt 2011, Ottenbreit-Leftwich et al. 2010, Sang et al. 2010). A crucial factor influencing new teachers' adoption of technology is the quantity and quality of pre-service technology experiences included in their teacher education programmes (Agyei

and Voogt 2011, Drent and Meelissen 2008). During developing pre-service teachers' technology skills through an introductory educational technology course, it is necessary to select and implement the most effective strategies on how to prepare pre-service teachers to integrate technology into their future lessons (Goktas et al. 2008, Polly et al. 2010).

Admiraal et al. (2016) presents that pre-service teachers can learn to teach with technology through: (1) teaching practice to enact what was learned in teacher education, as well as to receive feedback from pre-service teachers on this enactment, and (2) modelling of teacher educators and teachers in schools. Tearle and Golder (2008) argue that "watching" technology being used is no substitute for "hands-on" activities. Pre-service teacher educational technology programmes must therefore be very practical, and provide a wide range of approaches throughout their curriculum (based on Ottenbreit-Leftwich et al. 2010; Polly et al. 2010): information delivery of technology integration content (e.g. lectures, podcasts), hands-on technology skill building activities (e.g., workshops), practice with technology integration in the field (e.g., field experience), and technology integration reflections (e.g., electronic portfolios).

According to Angeli and Valanides (2009), collaboration with peers appeared to provide a time effective, high-challenge, low-threat learning environment for pre-service teachers, contrary to many technology learning experiences that can induce anxiety and failure avoidance. Brush et al. (2003) recommend providing the necessary scaffolds, such as additional support during the planning and preparation phases. Recent studies emphasized technology training in authentic teaching situations, and have revealed that the best practices provided to pre-service teachers with regards to technology training include authentic experiences in real K-12 classrooms (Ottenbreit-Leftwich et al., 2010, Goktas et al., 2008).

School projects working towards active learning

Authentic teaching situations, which pre-service teachers experience during school projects, are among the most significant changes that were gradually introduced in 2015/2016 and 2016/2017 into Technology Enhanced Learning at the Faculty of Education of the University of West Bohemia in Pilsen, Czech Republic. It is a subject included in a follow-up Master's degree programme for pre-service teachers who are preparing for computer science teaching at primary and secondary schools.

The main goal of the changes in the content and teaching methods of Technology Enhanced Learning was to significantly enhance the practical focus of the subject, and to bring pre-service teachers to relevant pedagogical communities to provide them with a basis for lifelong learning in the field of information and communication technologies in education. Therefore, the following active learning techniques were included in the course:

1) co-operative learning – pre-service teachers work together towards common goals and being evaluated individually (Dougherty et al. 1995),
2) collaborative learning – pre-service teachers work together towards common goals (Lumpe and Staver 1995),
3) discovery/inquiry-based learning – pre-service teachers are exposed to situations, questions, or tasks that allow the discovery of intended concepts (Wilke and Straits 2001)
4) problem-based learning – problems are introduced at beginning of the instruction, and motivation of pre-service teachers' learning followed (Dochy et al. 2003),
5) challenge-based learning – pre-service teachers are presented with a scenario in which they work towards a solution with others (Roselli and Brophy 2006).

All changes were carefully monitored and evaluated in the form of action research in 2015/2016 and 2016/2017. Not only the results of pre-service teachers were monitored, but pre-service teachers also repeatedly provided feedback and expressed their attitude to the individual activities being carried out. It is clear from the results of the action research that the most valued activities of pre-service teachers are those that allow them direct contact with in-service teachers. In the framework of the Technology Enhanced Learning, the activities in which pre-service teachers had the opportunity to collaborate or to establish contact with in-service teachers were realized in four different levels:

1) Workshops were organized for pre-service teachers, led by in-service teachers who actively use technology in their work.
2) Pre-service teachers were encouraged to become members of pedagogical communities sharing experience in the use of information and communication technologies in education.
3) As part of the training, pre-service teachers and in-service teachers participated in technical conferences focused on technology enhanced learning.
4) Joint projects with the primary school were prepared, realized, and reflected, during which pre-service teachers had the opportunity to co-operate with pupils within the framework of the computer science club.

Joint projects of pre-service teachers and primary school pupils are carried out in co-operation with a computer science teacher at the primary school. The theme and technologies used are different each year, always innovative, and usually using technologies that pre-service teachers and primary school pupils have not yet worked on. Pre-service teachers are very active in selecting topics, planning, preparing, implementing, and evaluating the projects.

In 2015/2016, the theme of the joint project was the use of Google Cardboard. Before the start of the project, the pre-service teachers were introduced to Google Cardboard, and the search for suitable applications was carried out. One pair of pre-service teachers prepared an introductory short

presentation of virtual reality, and the other pairs divided amongst themselves the applications that pupils would work with at their stations, devised tasks for the individual stations, and created worksheets for the students. The tuition was then held at the primary school in the afternoon, in the computer science club. The children, divided into groups, switched between the different stations and performed the tasks with the assistance of the pre-service teachers. As an example of one of the tasks, a so-called "virtual teleport" can be mentioned. Pre-service teachers pre-selected interesting places for the pupils in Google Cardboard, using Google Street View, and the pupils had to guess which country the virtual teleport took them to.

In 2016/2017, digital storytelling was selected as the theme of the project. Student teams were created, and one pre-service teacher was assigned to each team. Each team drew one point of the Internet Safety Decadero (for example, Do not give anyone your address or phone number, you do not know who is behind the monitor.) And the team's task was to make this point a digital story using Lego and Stop Motion on a tablet. Each group proceeded a little differently to solve the task. For all involved, it was the first familiarization with storyboard animation through a tablet, and each group chose a different method. The short and humorous animated stories that were created during the project can be further used, for example, for younger pupils in the e-safety course.

School project based reflections

For pre-service teachers using authentic classroom situations, the final reflection and discussion of the experience that the pre-service teachers gained are very important. Reflection is therefore given after the end of the school projects, with sufficient space, and where experience is discussed from different sides.

Table 1 shows an example of the reflective activity that took place with support for the Google Docs shared table. Pre-service teachers first individually filled in a row of the shared tables with what they learned during the project, 1) in general, 2) about the teacher's work, 3) about children, 4) about the technologies. After completing the pre-service teacher's table, the experience gained during the project was discussed together in front of an interactive whiteboard. They got to know the insights of others, and commented on each other's comments.

TABLE 1. REFLECTION OF THE PROJECT IMPLEMENTED AT ELEMENTARY SCHOOL

What I learned	GENERALLY	ABOUT A TEACHER'S WORK	ABOUT CHILDREN	ABOUT TECHNOLOGIES
Feedback #1	*How to lose the fear of standing in front of greater numbers of people, stay in control during presentation, and try to make as few mistakes as possible. Not be afraid to speak to pupils, give them interesting information, and not be afraid to communicate with them.*	*Approach, losing fear, trying to attract the children's interest so they are not bored. A great example was the class teacher who was active, and it was obvious that he really liked the pupils.*	*Not be afraid to communicate with them and give them suggestions, talk with them, so they don't just look and not talk (see when we were little ourselves). One must also learn from them to have some distance, not to get too close.*	*How Google Cardboard works, how to make computer science lessons more varied, and how to show pupils something new and current. Not to teach the same things all of the time which are from the last century. Try to lead them to learn about technologies themselves, to explore and develop.*
Feedback #2	*Even tasks that look simple to me can be difficult for others, and vice versa. It always depends on the situation and current knowledge of students.*	*It is necessary to be patient and to explain things more times, even if it seems that it should be perfectly clear to everyone.*	*If we tell them: stand right there, read this here, and do this exactly, then we can't expect any foresight (or even interest) from their side.*	*Most of the children did not know the technology, but had heard about it. I think that they really enjoyed it, unfortunately there are not more directly educational applications using VR, so I practically only used Google Street View.*
Feedback #3	*If both parties are interested in something, the result will be great. We introduced the children to something new, they enjoyed it, we had fun.*	*It can also be fun for me.*	*Each one is different, is entertained by something else, and knows something else.*	*The technology can be fun for anyone if the topic is well presented.*
Feedback #4	*I liked the relationship of the teacher and pupil, his pleasant approach.*	*That if there are six teachers per class, so it can be quite easy :-)*	*The children were quite good, probably because they were interested in the topic.*	*The benefit of new technologies in teaching is that, the students did not even know they were learning something.*
Feedback #5	*Simple tasks can be a big problem. Conversely, it may be surprising that even the youngest of them know more than I do.*	*It takes patience, but so far I am really enjoying it.*	*Younger children are easier to work with. They are active and more enthusiastic. I enjoy discovering new ones.*	*You can find the correct usage in the classroom if the teacher wants to, and thinks out the work with them.*
Feedback #6	*The work of a teacher is mentally demanding and time-consuming (especially mentally).*	*In the beginning, it can be difficult to manage your speech and approach, but after a while it gets easier.*	*The students tried, the sixth grade pupils were "fired up", but of course with students from higher grades it was more complex work, school and lessons for them at their age are an inconvenience (we were no different).*	*Even a simple application that may at first glance seem only entertaining for a short time may serve well in the classroom.*
Feedback #7	*What seemed like a simple task for us when we created it took the children more time than expected.*	*I must speak slowly and ask questions.*	*Younger children are happier and easier to catch their interest.*	*They are fun for kids, but not to overdo it with them.*

In 2016/2017, the final evaluation of the school project was supplemented by feedback from the participating primary school pupils. Pre-service teachers could reflect not only their own insights and comments from classmates and teachers, but also on the very valuable view of the children themselves. Examples of primary school pupils' answers to several selected questions are listed in Table 2.

TABLE 2. VIEW OF PRIMARY SCHOOL STUDENTS ON PRE-SERVICE TEACHERS

Question	Selection of pupil answers
What did you like about the pre-service teachers involvement in your team?	*They listened to our ideas.* *When we did something wrong, they helped us.* *They helped us with ideas and implemented them.* *They explained everything to us.* *They showed us how it's done, and then we knew what to do.* *I liked that they wanted everyone to join in, and came up with great ideas.* *They were kind and collaborated well (with us).* *They came up with ideas that we didn't come up with.* *It was fun with them.*
What should the pre-service teacher work on to make them a better guide for pupils?	*I don't know, nothing.* *I think nothing really.* *It was great.* *Nothing, it was all was good.* *Could show us how it's better.* *They seemed good to me, so I would not change anything.* *Nothing, they will definitely be a great teacher.* *I would not change anything, they were really great.*
What advice would you give to the pre-service teacher before they start teaching?	*I don't know :D* *Solid nerves and patience.* *None .... :)* *Not to have favourites, then when the student does something wrong, not to be sad from it.* *To stay just as they are.* *In order to have the patience with the children.* *To be themselves.*

Note. Free expression of elementary school pupils in a questionnaire after the completion of a joint project.

The final questionnaire of the subject, in which pre-service teachers return to what they experienced during the semester, is also very important for the reflection of pre-service teachers. It is important that pre-service teachers have the opportunity to compare their answers with the opinion of other pre-service teachers. Table 3 lists examples of responses related to school projects reported by pre-service teachers in the final questionnaire at the end of the semester.

TABLE 3. EXAMPLES OF PRE-SERVICE TEACHERS' FINAL FEEDBACK RELATED TO SCHOOL PROJECTS	
Feedback #8	*A very helpful event, where we could try working with children even before our official work experience, as a collective we put together a project, and we all depended on each other. Nobody slacked off during the creation of the project, everyone had a role they had to perform.*
Feedback #9	*I assess the project in the elementary school very positively. It greatly helped me in my subsequent start on my work experience.*
Feedback #10	*For myself, I have to evaluate the project positively. It would certainly be a good idea to try something like this during studies, and to see pupil reactions with your own eyes, as well as gain additional experience. Practical knowledge and experience are more important to me personally than a "mere" understanding of the theory, and I think that it would be a good idea to implement similar projects. Of course, not all projects will appeal to pupils, and you may even come across schools that are not willing to co-operate.*
Feedback #11	*I really liked teaching in an elementary school. It was a good experience. Something completely different to classic work experience. I would certainly continue, it is worthwhile - for us as future teachers, as well as for the kids, who also learn something new.*
Note. Free expression of pre-service teachers in a questionnaire after completing the course.	

Conclusion

Thanks to the pre-service teachers' school projects, they can gain unforgettable practical experience and competencies for the meaningful use of technology in teaching and project implementation, develop their teamwork and pedagogical reflection skills, and improve their relationships amongst themselves as well as their relationships with teachers.

The ability to see, directly in the school, how pupils are confronted with different types of activities, and real digital literacy is valuable to future teachers, and often leads to deconstruction of myths about student's digital hyper skills. An example may be one of the observations mentioned in the reflection: "*I was surprised by the reaction of the girl who was supposed to send a photo through Facebook in the school project, and said that she had never seen Facebook on a computer. She always connected only from her Smartphone*."

In conclusion, adjustments to the Technology Enhanced Learning subject for greater co-operation with in-service teachers, and the use of active-learning techniques that we implemented between 2015/2016 and 2016/2017, had the desired positive impact. Pre-service teachers actively participated in all activities of the subject, and achieved almost one-hundred percent attendance at the seminars, although attendance was not mandatory. School projects were a major asset not only for pre-service teachers, but also for primary school pupils and their teachers, who tried new activities and gained additional motivation to implement innovative technology enhanced activities.

Acknowledgement

The authors would like to thank the pupils of the primary school in Staňkov, as well as their teacher, Miloslav Khas, for their rewarding, long-term co-operation within the framework of joint projects in the field of technology enhanced learning.

References

Admiraal, W., Vugt, F. van, Kranenburg, F., Koster, B., Smit, B., Weijers, S, Lockhorst, D., 2017. "Preparing pre-service teachers to integrate technology into K-12 instruction: Evaluation of a technology-infused approach". Technology, Pedagogy and Education, 26, pp. 105–120.

Agyei, D. D., Voogt, J.M., 2011. "Exploring the potential of the will, skill, tool model in Ghana: predicting prospective and practicing teachers' use of technology." Computers & Education, 56,pp. 91–100.

Angeli, C., Valanides, N., 2009. "Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: advances in technological pedagogical content knowledge (TPCK)." Computers & Education 52, pp.154–168.

Brush, T., Glazewski, K., Rutowski, K., Berg, K., Stromfors, C., Van-Nest, M. H., et al., 2003. "Integrating technology into a field-based teacher training program: the PT3@ASU project." Educational Technology Research and Development 51, pp. 57–72.

Casey, P., Dunlap, K., Brister, H., &Davidson, M., 2011. "I only wish I'd known: Voices of novice alternatively certified special education teachers." International Journal of Special Education 26 (1), pp. 182–190.

Dochy, F., Sergers, M., Van den Bossche, P., & Gijbels, D., 2003. "Effects of problem-based learning: A meta analysis." Learning and Instruction 13, pp. 533–568.

Dougherty, R. C., Bower, C. W., Berger, T., Rees, W., Mellon, E. K., & Pulliam, E., 1995. "Cooperative learning and enhanced communication: Effects on student performance, retention, and attitudes in general chemistry." Journal of Chemical Education 72, pp. 793–797.

Drent, M., Meelissen, M., 2008. "Which factors obstruct or stimulate teacher educators to use ICT innovatively?" Computers & Education 51, pp. 187–199.

Everling, K. M., Dellelo, J. A., Dykes, F., Neel, J. L., Hansen, B. M., 2015. "The impact of field experiences on pre-service teachers' decisions regarding special education certification." Journal of Education and Human Development 4 (1), pp. 65–77.

Goktas, Y., Yıldırım, Z., Yıldırım, S., 2008. "A review of ICT related courses in pre-service teacher education programs." Asia Pacific Education Review 9, pp. 168–179.

Hodge, S. R., Jansma, P.P., 1997. “Attitude change of physical education majors toward teaching students with varied disability types.” Clinical Kinesiology (Online Edition) 51 (4), pp. 72–79.

Lumpe, A. T., Staver, J.R., 1995. “Peer collaboration and concept development: Learning about photosynthesis.” Journal of Research in Science Teaching 3, pp. 71–98.

O’Brien, M., Stoner, J., Appel, K., & House, J., 2007. “The first field experience: Perspectives of pre-service and co-operating teachers.” Teacher Education and Special Education 30, pp. 264–275.

Ottenbreit-Leftwich, A., Glazewski, K., Newby, T., Ertmer, P., 2010. “Teacher value beliefs associated with using technology: addressing professional and student needs.” Computers & Education 55, pp. 1321–1335.

Polly, D., Mims, C., Shepherd, C. E., Inan, F., 2010. “Evidence of impact: transforming teacher education with preparing tomorrow’s teachers to teach with technology (PT3) grants.” Teaching and Teacher Education 26, pp. 863–870.

Prater, M. A., Sileo, T. W., 2002. “School-university partnerships in special education field experiences.” Remedial and Special Education23 (6), pp. 325–334.

Roselli, R. J., Brophy, S .P., 2006. “Effectiveness of challenge-based instruction in biomechanics.” Journal of Engineering Education 95 (4), pp. 311–324.

Sang, G., Valcke, M., van Braak, J., & Tondeur, J., 2010. “Student teachers’ thinking processes and ICT integration: predictors of prospective teaching behaviours with educational technology.” Computers & Education 54, pp. 103–112.

Sears, S., Cavallaro, C., Hall, S., 2004. “Quality early field experiences for undergraduates.” Teacher Education and Special Education 27, pp. 75–79.

Tearle, P., Golder, G., 2008. “The use of ICT in the teaching and learning of physical education in compulsory education: how do we prepare the workforce of the future?” European Journal of Teacher Education 31 (1), pp. 55–72.

Wilke, R. R., Straits, W. J., 2001. “The effects of discovery learning in a lower-division biology course.” Advances in Physiology Education 25, pp. 62–69.

Whitney, L., Golez, F., Nagel, G., Nieto, C., 2002. “Listening to voices of practicing teachers to examine the effectiveness of a teacher education program.” Action in Teacher Education 23, pp. 69–76.

USE OF TABLETS IN TEACHING		PETR SVOBODA, PAVEL ANDRES CTU MIAS, Masaryk Institute of Advanced Studies Czech Technical University in Prague

e-mail of corresponding author:**petr.svoboda@cvut.cz, pavel.andres@cvut.cz**

Key words: modern technologies, multimedia, teaching methodology, innovation, information and communication technology.

Abstract: Modern technologies are becoming an important part of education. Communication methods in traditional schools were and still are, for the greater part oriented towards direct verbal and non-verbal forms. However, electronic communication has now permeated the educational space in the form of e-mail, chat, ICQ, Skype, WhatsApp, Viber, Linkedin, Facebook, Cloud, LMS systems, Webinars, Educasting and Podcasting. These are all effective and prospective means of supporting the educational process. It is necessary to emphasize that this happened not only at the level of technological thinking. The reflection of the modern didactical trends takes place on the boundaries of the pedagogical, psychological and also sociological disciplines. The development is considerably accelerating as a consequence of the ongoing technological changes and innovations.

Masaryk Institute of Advanced Studies at Czech Technical University in Prague (CTU MIAS) is currently working with Microsoft Corporation in the Czech Republic. The aim of this cooperation is to acquaint students with modern didactic technologies. The target respondents are students of accredited study programs, students of further teacher education and University of the Third Age. The partnership also means that tablets will be included in the teaching, where students will have the opportunity to work with Microsoft applications, as well as with third-party apps. To prepare all students for the wide-range use of modern technologies both in the future employment and personal life is one of the basic goals of the contemporary school.

Introduction

In addition to the accredited bachelors study programme "Specialization in the pedagogy" CTU MIAS offers also education programmes in the framework of the lifelong education, professional pedagogy, psychology, further education of school - teachers (accredited courses "DVPP") (Andres, Svoboda 2015). A great attention at this level is paid to the interactive technologies and modern didactical aids in teaching, m-learning, school information systems, application of mobile technologies in teaching, topical themes from the ICT sphere and other things. These activities are further developed at the application level, as an example can be mentioned the project "Windows EDU Proof of Concept Project" at the Czech University of Technology in Prague in cooperation with the company Microsoft (Andres, Svoboda 2016).

The project follows our past and present research assignments, and the already realized accredited study programme "Specialization in pedagogy". The study is intended for acquirement of a specified professional qualification for a direct pedagogical activity (the so called pedagogical competence) as a prerequisite for discharge of the function of a pedagogue (pursuant to the law No. 563/2004 Coll., about pedagogues, amendment of some laws and the subsequent order of the Ministry of Education, Youth and Sports (MŠMT) No. 317/2005 Coll., related to further education of pedagogues, accreditation committee and career system of pedagogues as amended).

The project corresponds with the strategic vision and strategic objectives of the Czech Technical University in Prague (Andres, Svoboda 2015, 2016).

The project is conceptually based on the strategic and conception documents of the Ministry of Education, Youth and Sports (MŠMT) where to the priority goals belongs primarily opening to the new

methods and ways of teaching by means of digital technologies, improving of competences of students in the sphere of work with information and digital technologies and last but not least also development of students´ informatics thinking (Strategy of the digital education until 2020, 2014). It is clear that proven and operational approaches (methods, forms, etc.) in educational process is appropriate to keep and continue to develop and at the same time exploit the potential of digital technology. The document notes that the use of digital technologies in teaching at faculties preparing future teachers has not yet become a strong and integral part of the teaching, even on the theoretical level, nor at the practical one.

Approach

It is important to prepare future teachers of technical subjects (field of study of Technical teacher education, and Vocational Teacher Education), not only in the level of knowledge of the individual technologies, but also how to apply these technologies and/or particular devices into the educational process effectively. In other words, project team is not concentrated on technological issues, didactic and methodological aspects are highly important in this applied investigation. Tablets will allow the introduction of new methods and forms of education in educational reality. Tablets provide opportunities for teachers and students for their effective and meaningful use where they can help in achieving educational objectives. In terms of use of new technologies, university gets credit for modern educational institutions and strengthens its market position. University prepares graduates for the future practical needs and should respond to the educational needs of secondary schools, educational organizations and the labor market as well. New skills, often described as the skills for the 21st century is now coming to the forefront (Gartner.com. 2013). These are selected strategic components of the project implementation.

Our goal is not mindless use of modern educational technologies. Technologies should always be used in accordance with the educational goals. The aim is to show the methods, forms and tools that facilitate the way to a new understanding. Furthermore, how to use new technologies, the use of m-learning support, mobile classrooms.

Results

CTU MIAS in this partnership has developed methodology materials using tablets in the classroom for the students and/or teachers participating in the course provided by CTU in Prague. CTU MIAS provided 18 methodology outcomes in these following disciplines: mathematics, physics, technical sciences, foreign languages, teaching of specialized technical subjects (Andres, Svoboda 2015, 2016).

Selected educational units have been based on the E-U-R method which is one of the planning methods of teaching, which is based on a constructivist approach to learning. This model is also called a three-phase model of learning. The aim of this method is mainly to facilitate the learning process in the sense of suitably chosen and suitably time-place activities to match the natural process of learning. The three-phase model of learning at the same time allows a considerable individualizing learning as each student has

different input knowledge and skills. Even within the same activity provides many different ways to understand the new curriculum (Košťalová, Hausenblas 2001; Zormanová 2012).

E-U-R consists of these stages of learning: evocation, awareness of the importance of information and reflection.

Examples of selected concepts

Drafts have been prepared on the basis of framework educational programs for basic education.

TABLE 1. EXAMPLE OF SELECTED CONCEPTS	
Subject	Information and communication technology
School year	1nd stage of elementary school
Unit	45 minutes
Topic	Searching for information on the Internet
Interdisciplinary relations	Media Education In the field of knowledge, skills and abilities; cross-cutting topic: – Enables develop the ability of analytical access to media content and critical distance from it. – Teaching to use the media potential as a source of information, quality entertainment and fulfilment of leisure time.
Key competencies	**Competence to solve problems** – The pupil finds information that is suitable for solving the problem, finds their identical, similar and different characters, uses acquired knowledge and skills to discover different solutions, is not discouraged by any failure and persistently seeks the ultimate solution to the problem. **Learning competencies** – The pupil searches and classifies information and uses them effectively, through interconnection and systematization in the process of learning, creative activities and practical life. **Communicative competencies** – The pupil understands various types of texts and records, pictorial materials, commonly used gestures, sounds and other means of information and communication. The pupil reflects on them, responds to them and uses them creatively for his development and active engagement in social activities. The pupil uses information and communication tools and technologies for quality and effective communication with the outside world.

Teaching Strategies	– Concept of the lesson corresponds to the three-phase model of learning E-U-R (evocation, awareness of the importance of information and reflection). – The activity of students in the lesson during the presentation of the problem - methods and tools for searching informations, formulation of request while searching on the Internet, searching attributes. – Sorting and processing of new information. – Demonstration experiment in pairs, group work. – Presentation of findings and other applications in practice.
Learning Outcomes	**Pupil** – Uses simple and convenient ways to find information on the Internet. – Searches information on portals, libraries, and databases. – Communicates via Internet or other common communication devices. – Actively engaging in the creation and character of teaching. – Works with information (text, image, video) that pupil subsequently interprets. – Uses mobile / tablet as a tool to find selected key terms, terms and phrases with the help of operators. – Realize own immediate ideas. – Finds further practical usage. – Gets acquainted with using of mobile on the Internet. Notice: The educational content of the educational field of Information and Communication Technologies is realized at the 1st and 2nd stage of basic education, but at the second stage there are already demanding cognitive processes, which are: – Developmental trends in information technology. – Value and relevance of information and information resources, methods and tools for their verification. – Internet.
What we need	PC with MS Windows Mobile 10 operation system or higher, mobile phones (smartphones), tablets / phablets, Microsoft OneNote for sharing workbooks, OneDrive / Sway.
Source: the authors	

Methodical instructions

Evocation

The substance of the first stage of the learning process is to evoke / recall what experience have the pupils so far in searching for information in general. What do they know about the topic, or what they think they know about it, what common life situations they encounter while searching for information.

Examples of life situations while searching for information: Encyclopaedias, timetables, library registers, phone contact of a friend in the directory, incl. his birthday, etc.

The task is to find out how pupils progress (with solving of a problem situation). How can we use these methods by the help of electronic devices? What are the advantages or limitations of mobile devices when working with information? Pupils formulate questions that they have and for which they will look answers in the next stage.

The substance of this learning phase is to engender a debate to collect these questions or ideas of pupils which they consider while finding information.

The teacher writes down their knowledge of the relevant topic to a shared working e-book. Individual pupils write their tips on notes in their tablets or mobiles through Microsoft OneNote / OneNote Class Notebook and share with each other. OneDrive can be used. The teacher corrects, extends and directs.

Evocative keywords and phrases: Internet browser (IE Explorer, Microsoft Edge), Bing search portal, instant search, advanced search using operators.

Awareness of

The teacher will provide a practical example of using the Internet search (link: Motivational video).

Task: Search for the work of Karel Čapek, Devatero fairy tales (e.g. link: Devatero fairy tales), nowadays classic fairy tales full of humor and humanity, in which the world of spells blends with the real world. Use of the link to the City Library. Save the work in a suitable format, such as pdf.

Pupils are introduced with the practical example and are discussing it. The teacher asserts or rebuts their assumptions.

For curious

Advanced ways to find information on the Internet, for example:

karel capek site: wikipedia.org - searched only on wikipedia.org. You have certainly noticed that Josef Čapek appeared in the results, we want to avoid this. How to do it??

karel capek dilo -josef site: wikipedia.org - finds all relevant results for the search connection Karel Čapek without links to Josef Čapek, so we have added the minus sign before the expression Josef (-josef).

karel capek" site: wikipedia.org - searches for a precise query on the text string Karel Capek at wikipedia.org. Just paste the text string into quotation marks, i.e: "search_text". But be careful! If you add quoted text to quotation marks, links will not be searched for, for example, by Karel Čapek, Karlovi Čapkovi and others.

karel capek filetype: pdf - finds all pdf documents that bind to the text string Karel Čapek.

Finally, the teacher summarizes pupils' interpretations and together they come to the conclusion:

Searching on the Internet is very intuitive; keywords can be entered with or without diacritics. Search can also be linked to voice input. The results can be further subdivided into three categories - websites, pictures and videos, news.

Reflection

The purpose of reflection is to use the pupils experience with the learning process in the future. What is important for reflection? Reflection is done by pupils together with the teacher, so it is not a teacher's evaluation of the pupil's work.

Pupils formulate conclusions in their own words, in relation to the objectives of the teaching unit (to the learning objectives).

In addition, the way (progress, thinking) how we have achieved these results will be assessed. In the context of the final controlled discussion on Internet search, generic search methods will be generalized, ("analogue world") - emphasis on the system view (e.g. search for a single book in the library - according to which criteria - substantive registers, authors register), means / tools for searching the Internet incl. final generalization will be repeated.

Homework for groups, for couples and for individuals:

1. You have the task of planning a trip abroad for your family; choose some city, find keywords about basic facts about destination (combination of text, images, videos).

2. A trip to Prague Zoo is planned for pupils. Provide exact instructions to students, incl. what tasks you need to look for, such as a zoo map, transport links, route planning, scheduling of visits, and activities that can be taken. Part of the task will be to find basic information about selected animals. These outputs will be included in the visit program and will be presented by selected pupils. Work can be divided into groups.

Other possibilities for finding information on the Internet / e.g. in case of travel:

1. Plan a trip home / abroad (Windows Maps app)

2. Weather forecast (MSN Weather app)

3. Language translations (app Translator)

4. Searching for transport connections (Transport companies - DPP fast app, Prague 10, IDOS - app Bus and trains)

Resources

How to search on the Internet **-** https://youtu.be/tS0S549aIc4

TABLE 2. EXAMPLE OF SELECTED CONCEPTS	
Subject	Natural history
School year	2nd stage of elementary school
Unit	45 minutes
Topic	Effect of sound volume on human health and hearing system
Interdisciplinary relations	Physics (acoustics - sound volume)
Key competencies	**Competence to solve problems** – The pupil chooses the correct procedure and evaluation; Solves problems independently; Is looking for another solution. **Learning competencies** – The pupil independently observes, experiments and compares the obtained results. He also critically assesses and draws conclusions for their use in practice. **Communicative competencies** – The pupil is able to argue and discuss; he is able to hear the opinions of others; he has concise, coherent and cultivated expression.
Teaching Strategies	– Presentation of problem – Activating teaching method – Group work – Understanding and processing of new knowledge – Demonstration experiment – Presentation of measured results
Learning Outcomes	**Pupil** - actively engages during the lesson by stimulating queries and realizes his / her current ideas - recognizes the impact of noise on human health - explains the human prevention against the excessive noise - actively uses the mobile phone or tablet as an educational tool - processes the measured values and presents them appropriately - acquire knowledge and use it in the future
What we need	Mobile phone, sound sources - tablet, MS PowerPoint, MS Office Mix, Windows App Store - Decibel Meter application
Source: the authors	

Methodical instructions

Evocation

Presentation on PC. The teacher is preparing it or, if interested, the pupil. Topic: Effect of sound volume on human health and hearing system.

Information in the presentation

Sound is called as all changes of pressure in air, water and other environments, recognizable by human hearing. The number of pressures per second determines the frequency (frequency) of the sound, i.e. its height and the unit is 1 Hz (Hertz). Healthy hearing senses sound in the range of 20 Hz to 20 kHz. An inaudible sound with frequencies below 20 Hz is called infrasound and frequencies above 20 kHz are called ultrasound.

The hearing aid is an ear. The ear consists of an outer, middle and inner ear. The acoustic waves pass through the ear canal, and they fall on the drums that blink. The drum vibrations are transmitted by the bones (hammer, anvil and stirrup) to the oval window. Membrane in the oval window transmits the vibrations to a fluid-filled snail where hair cell irritation occurs to convert mechanical vibrations to the nerve potential of the nerves through the nerves to the brain. Exposure to high levels of acoustic pressure causes irreversible damage to the hair cells and thus slow hearing loss. The human hearing perceives not only the height of the sound, but also the amplitude (i.e. the size) of the pressure changes, i.e. the sound pressure. The threshold of hearing is a subjective perception of sound at different frequencies. When the auditory sensation changes in the sense of pain, we talk about the so-called pain threshold (about 125 dB). The sound is measured and given in units of sound pressure dB. The 0 dB level is related to an acoustic pressure of 20 μPa (= 2x10-5 Pa), which is called the hearing threshold.

Sounds are the basis of speech and information reception, they can bring pleasant experiences, they are a natural and important part of human environment. Sounds too common or too strong or occurring at an inappropriate time and situation are referred to as noise. Noise is any unwanted sound (irrespective of its volume) that is disturbing or annoying, or which has harmful effects on human health. In general, sound and noise cannot be distinguished from physical parameters, but only from human effects.

Noise - the adverse effects of noise on human health can be divided into organ effects, disruption of activities and effects on subjective feelings. In the daytime, damage to the hearing system, cardiovascular effects, and an unfavorable effect on speech acquisition and reading in children are considered to be sufficiently proven. At night, changes in physiological responses, sleep disturbances and increased sleep medication are considered to be sufficiently proven.

How can we still avoid excessive noise?

- Limit the frequency of visits to discos and other loud music performances.

- Restrict the volume of listening to music not only from MP3 players, but also from TV, PC and radio.

- Minimalize time spent in a noisy environment.

- Not to perform noisy activities in a small space (reflection of the noise from the walls increases its level).

- Noisy activities (drilling, repairs at home, vacuuming, etc.) should be moved to the daily time.

- Be considerate to your roommates and neighbours.

Pupils respond with inquisitive questions, complement the presentation with their own opinions, and the teacher tries to stimulate and regulate the discussion.

Awareness of Demonstration experiment

The teacher measures the sounds that pupils in class make by sing of their mobile phone or tablet. It uses the Windows Store - Decibel Meter installed application. At this stage, it is necessary to decide what specific sound the pupils will use. For better measurability, it is advisable to use "uaáááá". If a teacher raises hand, pupils use the sound and the teacher measures the volume of their mobile phone (tablet). If the teacher puts his hand down, the pupils stop playing the sound (scream). Measurements are repeated if needed, and the volume of sounds emitted by pupils changes from time to time. The individual values are written on the board.

In the second part, the pupils will measure the volume of the sound. The teacher plays the prepared the sounds from the tablet. Pupils records the results of the measurements in MS OneNote's - electronic workbook.

Reflection

Pupils compare the measured values and summarize it in the discussion. They recap the gained information on the volume of the sound (how and what it is measured, how it affects human health, how they can defend against noise, etc.). For homework, pupils can measure the volume of sounds at

Notice from realization

In the first phase, using frontal teaching, students learned to work with Decibel Meter and measure the noise level in the classroom. In the second phase, the pupils split into groups and chose the place of measurement at school and in front of the school. Interesting was also, measurements taken at the road junction before the school. Pupils converted their metrics to values and processed them in the Excel spreadsheet editor. The output was table and graph. Everything was presented in the classroom in a presentation.

Resources for pupils

DOBRORUKA, L. J., et al. Přírodopis. III, Pro 8. ročník základní školy. 1. vyd. Praha: Scientia, 1999. ISBN 80-7183-167-0.

HAVRÁNEK, J., et al. Hluk a zdraví. Praha: Avicenum, 1990. ISBN 80-201-0020-2.

RAUNER, K., et al. Fyzika 8: učebnice pro základní školy a víceletá gymnázia. 1. Plzeň: Fraus, 2006. ISBN 80-7238-525-9.

https://osha.europa.eu/fop/czech-republic/cs/publications/files/prirucka_hluk.pdf

http://www.szu.cz/tema/zivotni-prostredi/hluk

http://www.vesmir.cz/clanek/hluk-kolem-nas

http://www.szu.cz/tema/zivotni-prostredi/prevence-a-ochrana-pred-hlukem

Conclusion

The aim was to identify the didactic possibilities of educational content, to provide suggestions to teachers at primary and secondary schools on how to integrate digital devices into the educational process (Vališová, Svoboda, Andres 2017).

It is important to prepare teachers of technical subjects (field of study of Technical teacher education, and Vocational Teacher Education), not only in the level of knowledge of the individual technologies, but also how to apply these technologies and/or particular devices into the educational process effectively.

Tablets will allow the introduction of new methods and forms of education in educational reality. Tablets provide opportunities for teachers and students for their effective and meaningful use where they can help in achieving educational objectives. In terms of use of new technologies, university gets credit for modern educational institutions and strengthens its market position (Svoboda 2010).

References

Andres, P., Svoboda, P. 2015 "Vybrané aspekty celoživotního vzdělávání učitelů - techniků", in: Danielova. L., Schmied. J. (Eds.). Sborník příspěvků ze 7. mezinárodní vědecké konference celoživotního vzdělávání Icolle. Křtiny: Mendelova univerzita v Brně. 2015. pp. 17 - 34.

Andres, P., Svoboda, P. 2016 "Multimedia as a Modern Didactic Tool – Windows EDU Proof of Concept Project at Czech Technical University in Prague". 19th International Conference on Interactive Collaborative Learning and 45th IGIP International Conference on Engineering Pedagogy. ICL 2016. Villach, Austria, pp. 29-40.

Gartner.com. 2013 Leading in a Digital World. 2013. https://www.gartner.com/imagesrv/symposium/gold-coast/docs/SYM-2013-Gold-Coast-Trip-Report.pdf., accessed on 12th July 2017.

Košťalová, H., Hausenblas, O. 2001. "Co je E-U-R". Kritické myšlení.cz. http://www.kritickemysleni.cz/klisty.php?co=klisty24_eur, accessed on 12th July 2017.

Svoboda, P. 2010. "Využití m-technologií v modelovém scénáři aktivity pedagoga". Media4u Magazine. 7 (3), pp. 125-27.

Vališová, A., Svoboda, P., Andres, P. 2017. "Application of ICT at Contemporary Schools in the Czech Republic". International Conference SCHOLA 2016 Pedagogy and Didactics in Technical Education. Praha, Czech Republic: Taktiq Communications s.r.o., pp. 75-78. https://spark.adobe.com/page/7ohkpMA0lD2Wl/, accessed on 12th July 2017

Strategy of the digital education until 2020, 2014. Ministry of Education, MŠMT.

Zormanová, L. 2012. Výukové metody v pedagogice: Třífázový model učení. Metodický portál, http://clanky.rvp.cz/clanek/c/z/16247/vyukove-metody-v-pedagogice-trifazovy-model-uceni.html>. ISSN 1802-4785, accessed on 12th July 2017.

TOWARDS AUTONOMOUS LEARNING WITH EPORTFOLIO EVIDENCE

LINDA POSPISILOVA

Language Centre
University of Pardubice
Faculty of Education
University of West Bohemia
Czech Republic

e-mail of corresponding author: linda.pospisilova@upce.cz

Key words: 21st century skills, ePortfolio, autonomy, self-assessment, language learning.

Abstract: There is an instant need and call specifically from employers to equip university graduates not just with undeniably essential knowledge and expertise but also with sufficient language skills and 21st century skills, such as information literacy, initiative, self-direction, and lifelong learning approach, to name a few. Digital portfolio implementation on the institutional or faculty level can largely contribute to development of the above mentioned skills alongside the content knowledge development. ePortfolios have been used with increasing trend for the past decade but have been known as European Language Portfolios in its paper form since 1990's. This contribution attempts to introduce a learning model enhancing autonomous learning through a series of assessment, self-assessment, goal-setting, and evidence based learning and it further investigates a combination of formal, non-formal, and informal learning through both summative and formative assessment. Single phases are going to be presented, critically analysed and evaluated using data from a pilot study conducted by three language teachers. Additionally, examples of student portfolios from various levels of higher education will be presented to demonstrate different levels of autonomy in university students and graduates.

Introduction

The concept of the 21st century skills and competencies has been in the centre of attention of educators and policy makers for nearly a decade. OECD published an in-depth analysis based on research conducted in seventeen OECD countries in 2009. The result of the research and its analysis provided a definition of the 21st century skills and competencies and allowed the authors to design a framework dividing selected skills and competencies into three dimensions: information, communication and ethics and social impact. The authors of the analysis agree on seeing the concept competence as a broader one including skill, knowledge as well as attitudes. Therefore the term competence is used.

The first dimension was categorized as information, which was significantly altered and brought to general attention by ICT advancement and expansion. Ananiadou, Claro 2009 suggests that new approaches to information are required especially concerning its assessment, evaluation, and organization in digital environments. New challenges in the areas of work with knowledge and information with respect to post-truth era we are living in right now should be highlighted. It has been widely believed that ICT applications require "higher order abilities such as management, organization, critical analysis, problem resolution" (Ananiadou, Claro 2009, 9). They divide the dimension called information into two sub-dimensions: information as source and information as product. These two sub-dimensions require different skills. The former calls for searching, selection, evaluation and organizing information while the latter demands restructuring, modelling of information and development of own ideas (Ananiadou, Claro 2009, 9). The second dimension of skills and competencies called Communication was also further divided into two sub-dimensions: effective communication and collaboration and virtual interaction. These two sub-dimensions utilize skills such as media literacy, communicative skills, and critical thinking, ability to

provide constructive feedback through critical reflection, team work, flexibility, and adaptability respectively. The last dimension presented in the research paper is Ethics and Social impact which should go hand in hand with the above mentioned dimensions developing skills such as social responsibility and a set of skills authors refer to as "digital citizenship". Although the key findings of the OECD survey highlight awareness of the OECD countries of importance of the 21st century skills and competencies and their integration across the curriculum and further need for an assessment policy development, there are not mentioned any concrete methods or tools which could contribute to the development and assessment of these competencies. The tools which seem to be suitable in targeted development of 21st century skills development and assessment seem to be for example implementation of the Padagogy wheel and ePortfolio tools in education and teacher training. The main concern of the Padagogy Wheel project and its numerous translations available also in the Czech language (Rohlíková, Vejvodová, Rohlík, Prade, 2016) is to bring the pedagogy necessary for learning with web and mobile applications forward. The centre of the Padagogy Wheel spotlights Graduate Attributes and Capabilities which should most likely include the above mentioned 21st century skills and competencies, those which are in focus of the educational institution and which should be the ones to start with when designing a study program, a course, or even a lesson. Other complex tool suitable for 21st century skill development can be considered a digital portfolio within which students have an opportunity to apply several above mentioned skills and competencies at once.

Digital Portfolio

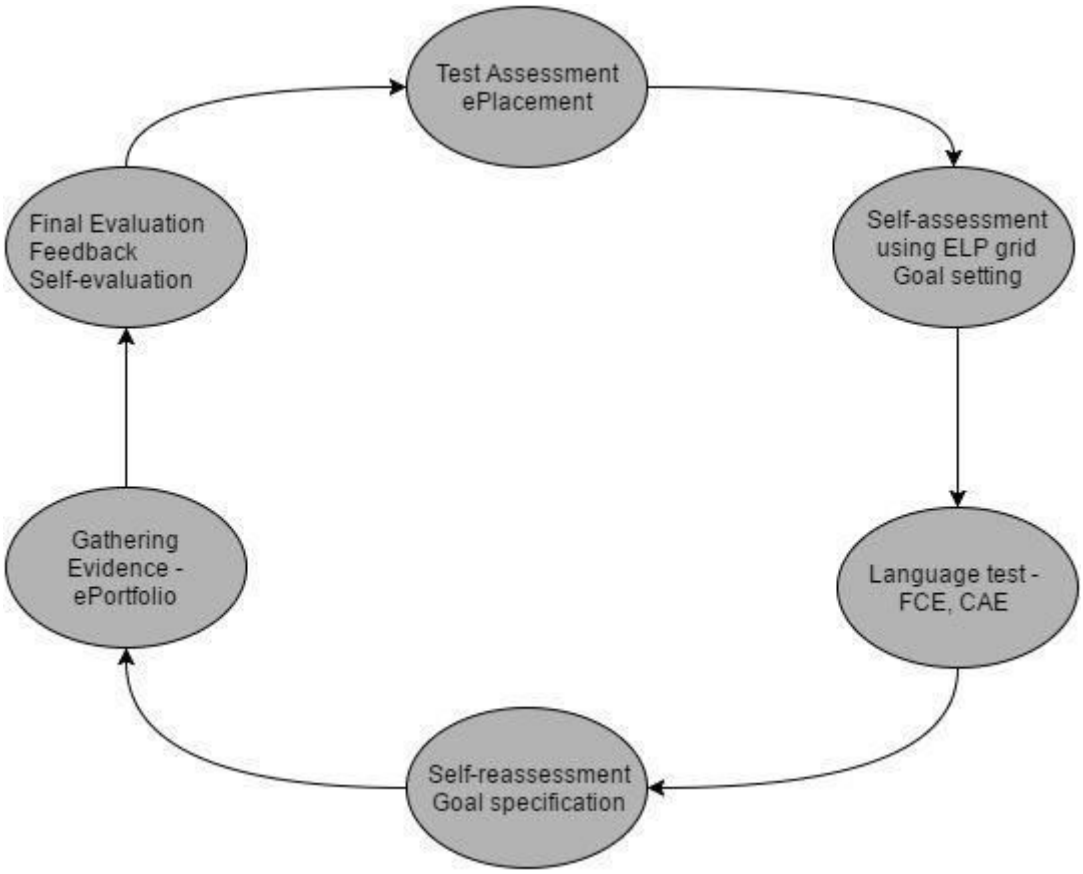
Digital portfolios, online portfolios or shortly ePortfolios can be used at all levels of formal education and in higher education their function can be viewed as defined by (The Glossary of Education Reform, 2014) "a compilation of academic work and other forms of educational evidence assembled for the purpose of (1) evaluating coursework quality, learning progress, and academic achievement; (2) determining whether students have met learning standards or other academic requirements for courses, grade-level promotion, and graduation; (3) helping students reflect on their academic goals and progress as learners; and (4) creating a lasting archive of academic work products, accomplishments, and other documentation." The Learning Cycle model which is the core of this contribution attempts to reflect all the above mentioned parts of the portfolio definition. The model was suggested to realize a shift from the Positivist to the Constructivist Paradigm of ePortfolio firstly introduced by (Paulson, Paulson 1994, 36) who puts these two paradigms into conflict and mentions several reasons for tension between the two paradigms: Positivist Portfolio "The purpose of the portfolio is to assess learning outcomes and those outcomes are, generally, defined externally. Positivism assumes that meaning is constant across users, contexts, and purposes… The portfolio is a receptacle for examples of student work used to infer what and how much learning has occurred." (p. 36) while the Constructivist Portfolio is defined as "The portfolio is a learning

environment in which the learner constructs meaning. It assumes that meaning varies across individuals, over time, and with purpose. The portfolio presents process, a record of the processes associated with learning itself; a summation of individual portfolios would be too complex for normative description." (p. 36). Paulson & Paulson sees the tension in the activities whose nature is completely different and in the way how the items are selected for the portfolio. Whilst in the positivist portfolio the tasks reflect the standards of the institution, the constructivist portfolio contains "items that reflect learning from the student's perspective" (p. 36). Reflecting on the experience with the Constructivist Portfolio Learning Cycle, I do not see such conflict between the positivist and constructivist approach since they can be used hand in hand to form a more complex and varied portfolio without omitting the essential student's ownership of learning and with the emphasis on autonomous learning. In the following chapter the learning cycle will be presented with respect to the two portfolio paradigms and 21st century skills and competencies development.

The Learning Cycle Model

At the University of Pardubice ePortfolio has been in use since 2012. It was introduced as a positivist portfolio and lifelong portfolio and has been used as a language teaching and learning tool and as a reflective tool in international exchange projects. In 2016 a pilot project of constructivist portfolio learning model was presented. Three experienced language teachers and 48 students participated in a 5-month pilot study running from February to July 2016. The aim of the study was to verify suggested learning model and thus enhance learner autonomy in language learning. The students came from all three levels of tertiary education: bachelor, master, and postgraduate study programmes to allow a comparison of scope of autonomy in students on the respective levels. The Learning Cycle was piloted in two types of courses: English for Specific Purposes and English for Academic Purposes. Smaller groups of students were selected as individual approach was required during the study. Another important criterion for selection of participants was their language level. The students of minimal B1+ level were selected since B1 level is defined as Independent user who "can produce simple connected text on topics which are familiar or of personal interest. Can describe experiences and events, dreams, hopes and ambitions and briefly give reasons and explanations for opinions and plans" (Council of Europe, 2001). The above listed can-do-statements, which also form the European Language Portfolio self-assessment part, are essential for students in order to be able to perform individual phases of the learning cycle in the target language. The cycle consists of six phases which support each other during the learning process and provide scaffolding for the continuation phase.

FIGURE 1: LEARNING CYCLE ENHANCING LEARNER AUTONOMY IN LANGUAGE LEARNING



Source: Own

Single phases of the Learning Cycle represent a shift from formal to informal learning and from controlling style to autonomy-supportive style of teaching. What is autonomy and how it is fostered in this case will be described in the following chapter.

Autonomous Language Learning

The concept of autonomy in language learning has been studied for decades. The most cited definition of autonomy by Holec dates back to 1981. It has been elaborated on since and the combined definition by Benson best demonstrates the philosophy behind the above mentioned Learning Cycle.

'Autonomy in language learning depends on the development and exercise of a capacity

for detachment, critical reflection, decision making and independent action (see Little 1991: 4);

Autonomous learners assume responsibility for determining the purpose, content,

rhythm and method of their learning, monitoring its progress and evaluating its outcomes.

(Holec 1981, 3; Benson 2007, 23).

The extended version of the definition includes several 21st century skills and competencies which were highlighted by Holec already in 1981. It is clear what autonomy is but how to successfully undergo a process of transforming traditional education into autonomous or autonomy supportive teaching and

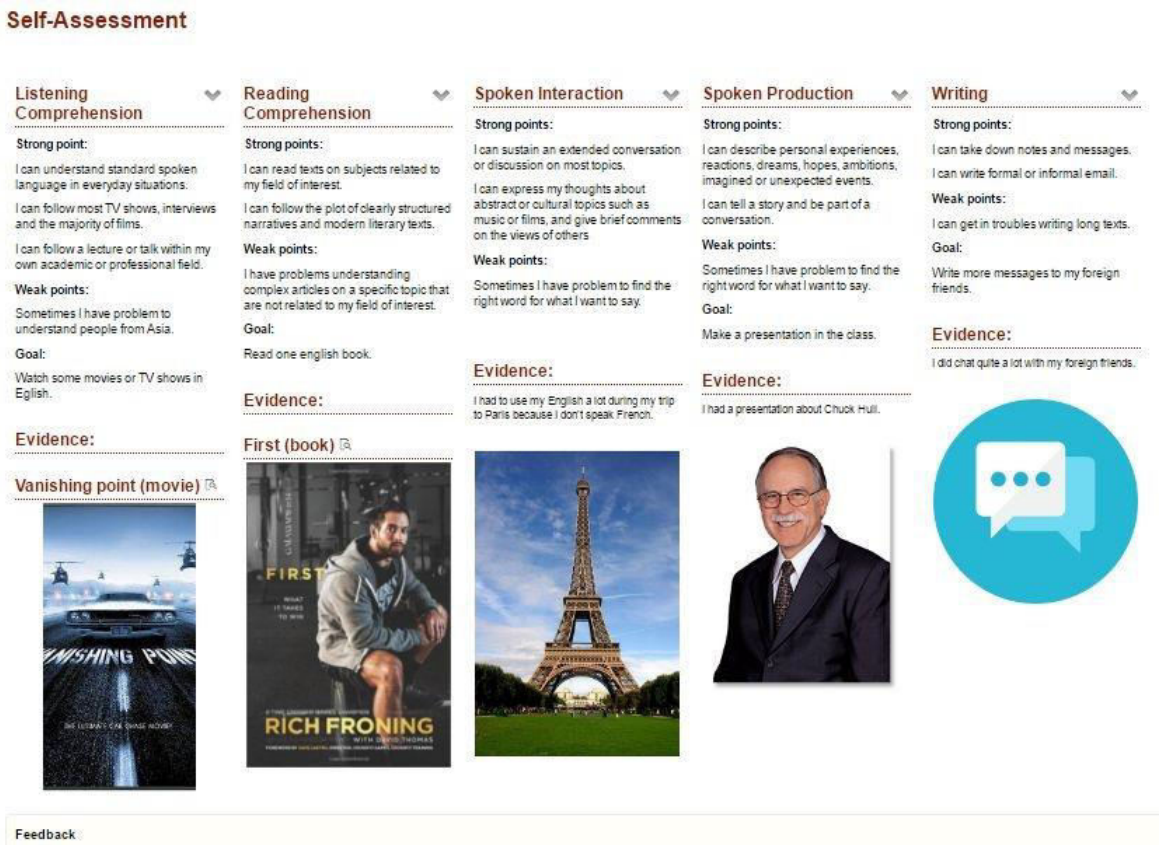
learning? David Nunan presents nine steps to learner autonomy which he considers to be rather a continuous process than a final state. The first step "Make instruction goals clear to learners" (Nunan, 2003) seems to be an obvious one, however, Nunan presents evidence obtained in a study where only one teacher spelled out the goals for the learners. This step, together with frequent monitoring in the initial phases of the Learning Cycle, seemed to be crucial to the success of the whole project. The second step to autonomy created by Nunan makes the second phase of the Learning Cycle and it is in Nunan's words "Allow learners to create their own goals" (Nunan 2003). While Nunan focuses on the motivational aspects of this step, in our case it was essential to provide students with sufficient information about the content and their current skills and knowledge in order to enable them to create targeted and meaningful goals. A set of assessment and self-assessment tools was introduced to the students prior and post the goal-setting phase to increase the probability of creating meaningful and individualised goals. Students were provided with a set of can-do-statements for each language skill and a mock FCE test with the aim to foster their self-assessment process. Depending on how successfully the students finished this phase they were later able to collect and present evidence for fulfilment of their goals. The third step to autonomous learning was put in practice in the fifth phase of the Learning Cycle during which the students were supposed to gather evidence of their learning in a form of ePortfolio. It can be implied that during this phase the teachers "Encourage learners to use their second language outside the classroom" (Nunan 2003), nevertheless, at the same time and probably more efficiently students encourage themselves to do so by setting their own goals. The fourth and fifth steps deal with student's awareness of learning processes and learning styles which are not in focus of this study but could be implemented later to improve the whole process. With greater level of autonomy in higher education in comparison with the lower levels of education the following two steps do not need to be emphasized, however, the last two steps seem to be very relevant to the tertiary education needs and mission. The eighth and ninth steps were put together in this text as they can be approached simultaneously "Encourage learners to become teachers" and "Encourage learners to become researchers" (Nunan 2003). Especially the latter from the last two steps is a key skill leading to successful university graduation whether it is practiced in the area of languages or in the field of study of involved students. It is obvious from both the definition of autonomy introduced at the beginning of this chapter and also from Nunan's nine steps to learner autonomy that 21st century skills and competencies form an inherent part of the autonomous learning process.

Through Autonomous Language Learning Towards 21st Century Skills

Through introducing a new constructive approach to ePortfolio use in language learning students are offered a new possible way of improving their language competence in a more thorough way and at the same time to knowingly practice 21st century skills. When students are trained how to work with the ePortfolio tool Mahara they are at the same time acquainted with using technology appropriately, being

aware of the Creative Commons and copyright issues, digital security, and advantages of using ePortfolio system over other alternative tools and with the rules for sharing and respect for privacy. In the next phase students undergo self-assessment and goal-setting thus practicing critical analysis and reflection. The goal-setting phase was assessed as the most difficult phase of the whole cycle by both students and teachers and students of both bachelor and master levels needed consultations about goal setting. Based on the de-briefing session of the teachers involved in the pilot study, a brief theoretical insight into goal setting and S.M.A.R.T. criterion tool (Doran 1981) was introduced to assist in the goal-setting phase to help students create specific, measurable, achievable, relevant, and time-bound goals. When needed, there is more that can help students create goals they will actually achieve. The Locke and Latham's Goal-setting theory describes five principles that can lead to goal achievement necessary for a successful completion of the Learning Cycle. These five principles include clarity, challenge, commitment, feedback, and task complexity (Locke, Latham, 1990) and further elaborate on the S.M.A.R.T. tool. The last phases of the cycle involve students in their own learning and monitoring their progress which is concluded by the final phase engaging students in evaluation of their own outcomes. Both summative and formative assessment is applied at this state to provide students with a complex analysis of their outcomes aspiring to introduce assessment for learning to the institution. An example of ePortfolio created while undergoing the phases of the learning cycle can be seen in the following picture.

FIGURE 2: AN EXAMPLE OF EPORTFOLIO IN PROGRESS CREATED BY A BACHELOR STUDENT



Conclusion

It can be concluded that working with the Autonomous Learning Cycle which was successfully piloted by three language teachers can increase level of autonomy in lower levels of tertiary education students and the teachers agreed that with certain improvements especially in the goal-setting phase the cycle can foster language learning by making it more targeted and individualised and at the same time 21st century skills and competencies can be addressed utilising just a limited time of one term. An access to ePortfolio allows students to own their learning and be able to reflect on their learning outcomes in future and repeat the cycle again with or without teacher's guidance. The learning outcomes can also be used as evidence in a form of work-related learning ePortfolio when applying for a job.

References

Ananiadou, K., Claro, M., 2009. "21st Century Skills and Competences for New Millennium Learners in OECD Countries." OECD Education Working Papers, No. 41, OECD Publishing. http://dx.doi.org/10.1787/218525261154 accessed on 24th April, 2017.

Benson, P., 2007. "Autonomy in language teaching and learning." Language Teaching 40: 21–40.

Council of Europe, 2001. "Common European framework of reference for languages: Learning, teaching, assessment." Cambridge, U.K: Press Syndicate of the University of Cambridge.

Doran, G. T., 1981. "There's a S.M.A.R.T. Way to Write Management's Goals and Objectives." Management Review 70 (11), pp.35–36.

Locke, E.A., Latham, G.P., 1990. "A theory of goal setting & task performance." Englewood Cliffs, N.J: Prentice Hall.

MindTools. Locke's Goal-setting Theory. https://www.mindtools.com/pages/article/newHTE_87.htm Accessed on 14th May 2017.

Nunan, D., 2003. "Nine steps to learner autonomy." http://www. andrasprak.su.se/polopoly_fs/1.84007.1333707257!/menu/standard/file/2003_1 1_Nunan_eng.pdf), Accessed on 14th May 2017.

Paulson, F.L., Paulson, P., 1994. "Assessing Portfolios Using the Constructivist Paradigm" in Fogarty, R. (Eds.) (1996). Student Portfolios. Palatine: IRI Skylight Training & Publishing Rohlíková, L., Vejvodová, J., Rohlík, O., Prade, M., 2016. Kolo iPadagogiky V4.1. Czech translation of Carrington, A. Padagogy Wheel V4.1. (2015). Retrieved from bit.ly/PWposterCZEHD. Accessed on 12th May 2017.

The Glossary of Education Reform. Great Schools Partnership, 2014. Portland, USA. http://edglossary.org accessed on 13th May, 2017.

E-LEARNING EDUCATION SUPPORT

TOMÁŠ KUBÁLEK, MARKÉTA KUBÁLKOVÁ

Faculty of International Relations
University of Economics, Prague, Czech republic

e-mail of corresponding author: kubalek@vse.cz

Key words: education, e-learning, video record

Abstract: The aim of our research is to determine which available information sources are most beneficial for the education of students of full-time and combined forms and which ones are considered to be the most effective to obtain the required knowledge and skills. Surveys show that information enters our brains as follows: 87 % through the eyes, 9 % through the ears, 4% through other senses. In our survey conducted in October 2016, 67 % of respondents (students of fulltime form of studies) said that they consider personal attendance to be most beneficial. So, what is the best way to support knowledge acquisition with the other aids? How to effectively educate students combined studies? Well processed e-learning support containing not only textbooks but also targeted videos are playing a pivotal role. In order to find out what materials are most widely used for studying and how the videos are rated, we conducted repeatedly a questionnaire survey (in 2016 and 2017). We addressed informatics students that use print textbooks, PDF materials (available free), educational presentations, tutorial videos made with Mediasite and purpose-built videos available on the team website or directly on YouTube, as ancillary educational materials. Two surveys are supplemented by an analysis of the use of different resources. The conclusions of the investigation and analysis are presented herein.

Introduction

Nowadays, high demands on the knowledge required for professional employment as well as for personal development of an individual are being placed. Education is becoming a lifelong process, which is also required by the labour market. According to a survey conducted by the company Manpower (Halbrštát 2016, 1) in September 2016, 26 % of large companies stated that they would hire new employees by the end of the year. Although the labour market is changing significantly in favour of job seekers, there is a structural imbalance. The strongest interest in new employees is expected in the civil construction and the manufacturing industries (the net labour market index +13 %), a decrease is expected in the agriculture and in raw material extraction (-7 %). "The harmonization of the further education offer with the requirements (needs) of the labour market can be considered one of the most challenging and least sizeable areas which is addressed to by almost all employment services as well as employers." (Kaplan 2017).

In our research, we focus on education in the effective use of computer and information technology. Survey conducted by the Czech Statistical Office the Adult Education of 2011 (ČSÚ 2016) shows that the use of computers is in fifth place in the area of workplace education.

How could full-time and part-time students be educated effectively in this area? The objective of our research consists in finding which available information sources are most beneficial for the education of students (full-time and combined forms) and which ones are considered to be the most effective to obtain the required knowledge and skills. Surveys show that information enters our brains as follows: 87% through the eyes, 9 % through the ears, 4 % through other senses (Petty 2008). In our survey, which we conducted in October 2016, 67 % of respondents stated that they considered their personal attendance at

courses the most beneficial and effective for their education. So, what is the best way to support knowledge acquisition with the other aids? How can part-time students be educated effectively? This information was searched through a repeated questionnaire survey (in 2016 and 2017). We turned to students of IT, who used hard-copy (printed) textbooks, freely available texts in an e-form, educational presentations, lecture recordings and purpose-made videos as supporting study materials. The survey was accompanied by an analysis of using individual resources. The conclusions of the investigation and analysis are presented herein.

Background

To support the education of students and to increase the quality of education, we compiled a set of teaching aids of various types, including printed materials (textbooks), materials in an e-form (texts for students in the format PDF), supporting presentations showing the discussed topic in a condensed form, focusing on the visualization using images, diagrams and screenshots, videos of lectures and exercises as well as purpose-made videos (published on YouTube). This set of materials should support the effective education of full-time students and students in the combined study programme.

The starting point of the paper is based on many years of experience with e-learning support:

- In 2002, we participated in the project of distance education of the follow-up Master's degree programme concerning the field of Business Economics and Management at the Faculty of Business Administration University of economics, Prague. The field of study had been accredited successfully, and later the accreditation was extended. The field of study was open until 2014.
- In 2011, we participated in the project of a combined form of Bachelor's degree programme in the field of Business Manager at the Faculty of International Relations University of economics, Prague. The field was accredited successfully. The accreditation was extended in 2016. About 60 students are admitted every year.
- Since 1990, we have been teaching the subjects of Managerial Informatics focused on using office applications in the work of an economist/accountant (focused on Office 365). The subjects are categorized as optional subjects, compulsory subjects and subjects of the minor specialization in the full-time form for students of the Faculty of International Relations and other faculties as well as compulsory subjects in the combined form in the field of Business Manager of Bachelor's degree.

Over the years of searching the optimum form of e-learning, we have used a variety of aids: Zoner Context (2002–2004), LMS eDoceo (2004–2006), LMS Moodle (2006–2008), e-learning in the study information system InSIS (2008–2012). These days, we are making all materials on the websites of the specific subjects available; they are made in SharePoint.

The preparation and evaluation of supporting texts for both full-time and combined programmes are based on a four-stage quality cycle:

- planning - objective settings,
- implementation - introduction of procedures to achieve the targeted objectives,
- assessment - proposal for evaluation mechanisms based on data collection and processing and their creation,
- revision - ensuring and incorporating of feedback, setting new measures to achieve the existing or new objectives.

Planning

The target group consists of students in the field of applied informatics studying full-time or combined forms.

- In the Bachelor's full-time studies, it is a compulsory subject 22F200 Management Information Technology. The lectures include the introduction to the most common applications increasing the effectiveness of student's work, preparation of bachelor's theses and those ones which they encounter in practice (students work on their own laptops). The exercises emphasize the mastery of MS Excel and MS Word. About 250 students take this subject each term.
- In the full-time form of the follow-up Master's study programme, we offer the minor specialization 2MI Information and presentation technologies in practice to students from any faculty. About 20 students take this subject every term.
- In the combined form of the Bachelor's programme in the field of Business Manager, we offer 4 subjects. Students have a fixed curriculum; therefore, the subjects are compulsory for them. About 50 students are taught in each of the 4 subjects each term.

Implementation

The provided education support:

- Textbooks

We have created 10 textbooks for individual subjects; they cover the tuition consistently (the extent of the textbooks is 1,542 pages). The special-purpose textbooks bring a significantly higher effectiveness of teaching. They are based on a single template. Their clarity is increased by marginalia (side notes) with basic concepts and links to demo files. In the attachment, there are tasks for individual practice.

- Multiple-Type Recordings

Lectures are recorded in the form of multiple-type recordings using recorders and the catalogues Mediasite of firm Sonic Foundry. The catalogue uses the storage of Cesnet. A part of recordings is publicly available (http://mediaisite.vse.cz), whereas the other part of recordings is available only to students in the field of Business Manager upon logging. A typical record is made up of 4 synchronised folders: the first desktop record, the second desktop record, video and audio. Each teacher uses two computers. The one is used for the presentation of the application, whereas the other one is used to show the presentation in Power Point. The recording can be viewed on-line or later in the catalogue of recordings. The easy recording search is supported by a clear catalogue structure as well as by the possibility of searching automatically scanned presentation texts.

To record the lectures, we use 2 rack and 2 mobile recorders Mediasite. In selected 16 classrooms, there are camcorders to record video and cable installations to record the desktop of the computer. The lectures of informatics are recorded by teachers upon starting the recorder manually. The lectures in the field of Business Manager are recorded automatically after setting the recording in the calendar.

- Websites

Every reference is available to students on public websites (http://min.vse.cz). To create them, we use SharePoint. The websites are structured through a system of tile guideposts. The public websites contain freely available study texts in the form PDF, demonstrative examples completing the study texts, presentations, hypermedial teaching aids to teach the application PowerPoint, purpose-made videos, information on teaching in the form of websites and links for further study.

To teach the application PowerPoint, purpose-made video sequences published on YouTube were made; in total 65 videos lasting 2 hrs and 44 min (address of hypermedial teaching aids http://sp.vse.cz/sites/fak2/min/powerpoint). To record the videos outside classroom, we used the following applications: Skype for Business, Skype Broadcast Meeting (however, it is not included in the education plans Office 365, it does not allow screenshots), Office Mix (recommended for synchronized recording of video and presentation).

- Testing Knowledge

The resulting skills and knowledge of students' are then tested: using validation tests containing exercises to be done according to the specific task, teachers check the fulfilment of the task and assign points in the study information system in the mid-term and at the end of the term. E-tests in the study information system are also available; students can see their results immediately after doing the test.

Evaluation

Students' feedback containing their view of various forms of e-learning support is detected in several ways:

- during the term, students of a compulsory subject fill in a questionnaire in the application called Forms (Office 365); the questionnaire is anonymous. The response to students' comments can be provided within the specific term;
- through seminar papers, students can give their opinions on the subject; their point of view is not anonymous, still it is a valuable resource for further improvement in teaching;
- in exam periods, students can fill in a survey in the study information system.

Research findings

Revision

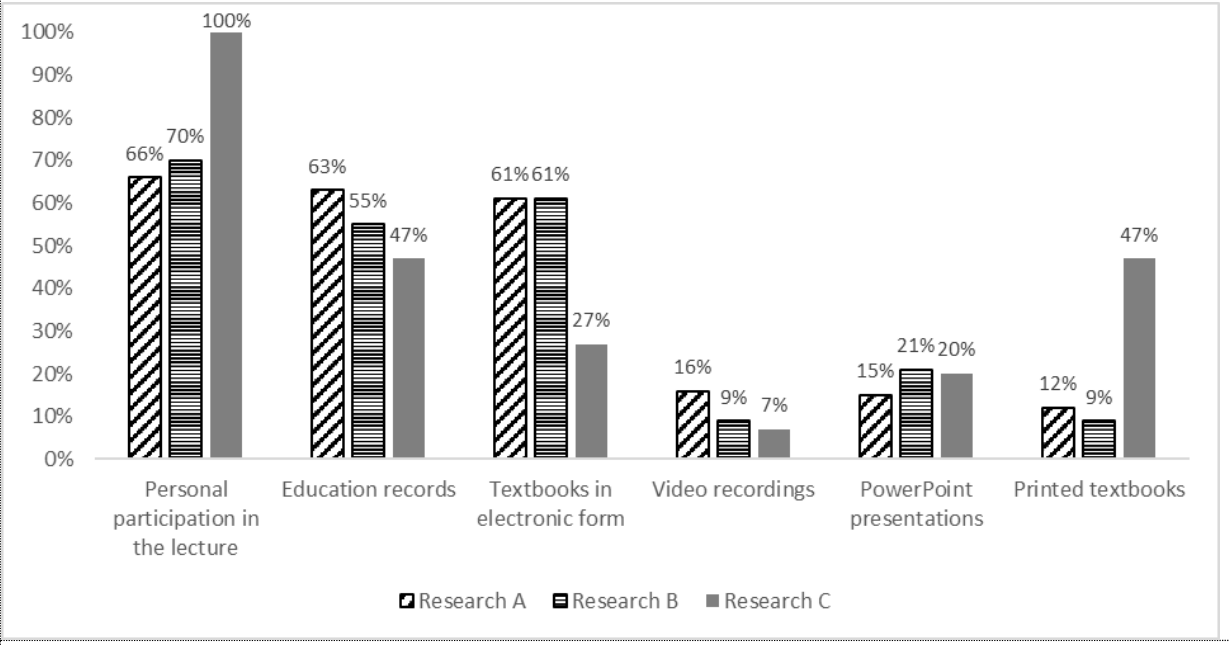
We present the findings of three surveys:

- Survey A: conducted among students of compulsory subject of the full-time study programme in October and November 2016. All 261 enrolled students were addressed. 163 students participated in the survey (62 %).
- Survey B: conducted among students of a faculty-compulsory subject of the full-time study programme in April and May 2017. We addressed all 281 enrolled students. 130 students participated (46 %). Again, the most beneficial is personal attendance at lectures, then textbooks and recordings of lectures.
- Survey C: conducted among students of a compulsory subject of the combined form of studies in April and May 2017. We addressed all 59 enrolled students. 15 of them participated in the survey (25 %). They consider the most beneficial personal attendance at the seminar; the same level was recorded for textbooks and lecture recordings.

The findings:

- The most beneficial source of information: The results are summarised in chart 1. The students of full-time as well as combined study programmes consider personal attendance at lectures the most beneficial resources. The students of a combined form consider their personal attendance at lectures crucial. The next place belongs to lecture recordings and textbooks.

CHART 1. THE MOST BENEFICIAL SOURCE OF INFORMATION



Source: Own

- Multiple-type recordings: Lecture recordings were used by 61–62 % of respondents; the same value was obtained in all the surveys. The use of recordings in the summer term of 2017 is shown in chart 2. The highest ratings were achieved by the recordings of the subject 22F200 (a compulsory subject for full-time students) – 115 thousand minutes (i.e. on average 440 minutes of viewed recordings per one student). In the combined form of studies, it was the subject 2OP863 (teaching Office 365) – 24 thousand minutes (on average 560 minutes per one student).

CHART 2. MULTIPLE-TYPE RECORDINGS BY SUBJECTS

Source: Own

- Printed textbooks: the full-time students do not show a great interest in them (A: 28 %, B: 22 % of respondents); one of the reasons may be the fact that their e-forms are freely available on the websites. The students of the combined form of studies showed a higher interest (C: 70 %).
- Textbooks in an e-form (freely downloadable in the format PDF): they are popular sources of information (A: 70 %, B: 73 %, C: 66 % of respondents). The reason consists in the fact that they are free of charge, readily available and searchable.
- The purpose-made video sequences concerning the application PowerPoint published on YouTube were used by a third of full-time students (A: 35 %, B: 34 %), and 44 % of students in the combined form of studies (B). The reason may be a less demanding topic presented on the videos. If we have a look at the YouTube analytics, we can find that 69 videos were viewed 3832 times. A total watch time is 4867 minutes. The biggest source of traffic is the video search (29 %). However, the students access to the videos from the websites, where they can find further support for them. If we restrict the statistics only to the access from the video list (which is 27 % of the traffic), the number of views amounts to 1050 and the view time 1421 minutes. The highest attendance was recorded on 5 March 2017 (3 days after the lecture concerning the application PowerPoint) – 247 views, a total view time of 274 minutes.

- Presentations: are used by about a half of full-time students (A: 48 %, B: 51 %) and 72 % of students in the combined form of studies. Presentations are used to find the required information in a concise form quickly.
- Other conclusions: Both the full-time students and the students of the combined form of studies search for additional information on the Internet (A: 61 %, B: 58 %, C: 63 %). They mention searching video-manuals, for example on YouTube, as the second significant source (A: 25 %, B: 18 %, C: 20 %). Other sources of information include textbooks or study texts; however, their share is small (A i B: 3 %, C: 13 %).
- In particular, they use laptops to study from electronic resources (A: 92 %, B: 92 %, C: 86 %), the second place belongs to mobile phones followed by tablets. The laptops are mainly operated through OS Windows. MacOS is used by 16 % of respondents.
- The survey respondents rated their relationship to information technologies on a scale from 1 to 5 (meaning 1 for a negative relationship, 5 for a positive one). An average achieved score is 3.7 in the survey A, 3.28 in the survey B and 4.33 in the survey C.

Conclusion

Students increasingly prefer electronic forms of study supports. More and more, they appreciate purpose-made textbooks accompanied by attendance at lectures based on high-quality presentations and the multiple-type recordings of lectures. The multiple-type recordings of lectures allow them to return to some more complex topics of lectures, to attend missed lectures and to revise topics for continuous tests and state exams.

On the basis of the survey, we compiled a profile of a typical full-time student and a student in the combined form of studies.

The typical full-time student evaluates his/her relationship to information technologies (the scale from 1 to 5) with a grade 3.7, his/her current knowledge with a grade 3.2. These students mention that the most beneficial way to master the topic is their attendance at the lecture. They use textbooks in an e-form as another source of information and they appreciate the multiple-type recordings of lectures. To a lesser extent, they use presentations or video-manuals and/or printed textbooks. They rather search for additional information for study on the internet. To do so, they use laptops with the operating system Windows.

Such a typical student of the combined form of studies evaluates his/her relationship to information technologies higher - the grade is 4.3 and his/her current knowledge similarly - the grade is 3.1. To master the topic, they consider personal attendance at lectures crucial; then they use printed textbooks and multiple-type recordings of lectures. To a lesser extent, they used electronic textbooks or presentation.

They rather search for additional information for study on the internet. To do so, they use laptops equipped with the operating system Windows (never macOS).

Based on long-time experience and results of the survey, we concluded that it was advisable to focus on the following elements:

- textbooks should be strictly purpose-made and they should have a clear structure (freely available with a possibility of their printing);
- the multiple-type recordings of lectures which do not need to be edited are used as recordings of a real lecture, therefore they are readily available immediately after the lecture;
- clear presentations for lectures with sufficient visualization and concise and quick manuals;
- purpose-made videos with a maximum length of two minutes.

References

ČSÚ, 2016 (5). "Šetření o vzdělávání dospělých - AES | ČSÚ." https://www.czso.cz/csu/vykazy/setreni_o_vzdelavani_dospelych, accessed on 14th May 2017,

Halbrštát, J., 2016. "Manpower Index trhu práce Q4 2016.". https://www.manpowergroup.cz/manpower-index-trhu-prace-q4-2016/, accessed on 14th May 2017.

Kaplan, P., 2017. "Sladění nabídky dalšího vzdělávání s požadavky trhu práce." http://www.nuv.cz/t/sladeni-nabidky-dalsiho-vzdelavani-s-pozadavky-potrebami, accessed on 14th May 2017.

Petty, G., 2008. Moderní vyučování. Praha: Portál.

THE USE OF AROPÄ PEER-REVIEW SYSTEM IN THE UNIVERSITY COURSE ETHICS, CORRUPTION AND TRANSPARENCY

TOMÁŠ JACKO
Faculty of National Economy
University of Economics in Bratislava, Slovakia

JANA JACKOVÁ

Faculty of Natural Sciences
Matej Bel University in Banská Bystrica, Slovakia

e-mail of corresponding authors: tomas.jacko@euba.sk; jana.jackova@umb.sk

Key words: e-Learning, Aropä, Peer Review, Contributing Student Learning

Abstract: The article deals with the use of Aropä peer-review system. Compared to other web e-learning platforms such as Moodle or Blackboard, this free to use system has a relatively limited scope and it allows in particular to upload student assignments and to provide feedback from peers. The authors used the Aropä peer-review system for the first time in the academic year 2016/2017. The aim of this article is to critically analyse the system and to provide experience and feedback on its use during the university course Ethics, Corruption and Transparency. The course has been running for two years at the Faculty of National Economy, University of Economics in Bratislava. The article deals with some practical issues faced by teachers who employ e-learning and peer-review platforms. Among the problems that the authors have experienced and successfully dealt with were: plagiarism, gaming and free-rider problem, student motivation, and contradictory feedback. Aropä proved to be an excellent peer-review system which supported development of critical thinking and reflective skills in students throughout the semester. Furthermore, the authors took a risk and introduced an Anglo-Saxon style into the teaching and assessment of the course in an environment which is still heavily conservative and traditionalist in terms of the teaching methods. Primarily, regular weekly essay writing and peer review through the Aropä system was introduced as one of the three modes of course assessment leading to the final course grade. Students had to write and assess their peers' essays – both a task and a skill that the Slovak university educational system does not prepare for. The risk paid off and the quality of essays has steadily increased over the semester. Both the teacher and the students found the web-based peer-review system useful and effective in delivering the course outcomes – both in terms of knowledge and skills.

Introduction

Learning and teaching has never been an easy process. Modern trends in education and learning, growing expectations and needs of students and of the labour market, open education and knowledge society are a challenge not only for teachers and educators. E-learning systems or platforms have enabled and helped for nearly two decades to solve many of these challenges. One of these is, for example, ever increasing demands in terms of the interactivity of lessons or lectures, the use of ICT and the emphasis on students acquiring soft skills. E-learning systems allow an increase in flexibility of teaching and studying due to rapid technological development and easy Internet access. Various tools within e-learning systems or specialised e-learning platforms enable development of cognitive and affective capabilities. Furthermore, they support critical thinking; collaborative learning; and among many other soft skills, students can learn how to provide, receive and analyze feedback. Such systems with a narrower focus include PeerWise (Jacková and Denny 2015) and Aropä. They make contributing student learning and mutual feedback through peer review easy and freely accessible. In both systems, students evaluate other students' contributions. In PeerWise, these test assignments are completed by selecting and explaining one correct answer (Jacková et al. 2016). Aropä allows uploading, sharing and providing feedback on student contributions of various kinds, ranging from short contributions (e.g. solutions to short tasks, specific parts of larger tasks, parts of a computer programme, etc.) to lengthy contributions such as academic essays, projects and reports.

The aim of this article is to critically analyse the system and to provide experience and feedback on its use during the university course *Ethics, Corruption and Transparency*. The course has been running for two years at the Faculty of National Economy, University of Economics in Bratislava. The article deals with some practical issues faced by teachers who employ e-learning and peer-review platforms. Among the problems that the authors have experienced and successfully dealt with were: plagiarism, gaming and free-rider problem, student motivation, and contradictory feedback. The authors would also like to add their perspective to the growing body of research on the use of Aropä (Purchase and Hamer 2017; November 2011, 2012; Welsh 2014; Patterson 2009; MacDonald 2013; Finlay 2012; Huston 2015).

Hamer et al. (2008, 195) define "pedagogy that encourages students to contribute to the learning of others and to value the contributions of others" as Contributing Student Pedagogy (CSP). Peer review is part of this pedagogy (i.e. learning) and Hamer et al. (2011, 83) understand student peer review as a process in which "students look at other students' work, and provide comments"on this work. Peer review activities encourage development of cognitive and affective capabilities and can help to improve students' results and student satisfaction (Kubincová et al. 2017). Peer review itself is not limited to online arena only. However, with the rapid technological advancements and easy Internet access, online peer review is more accessible than ever before. Hamer et al. (2011, 91) identify a number of online tools for peer review activities: Aropä, Expertiza, ClassCompass, Moodle Workshop (Moodle plugin), OSBLE, PeerWise, PRAISE (Peer Review Assignments Increase Student Experience), PRAZE, StudySieve, WeBWorK.

Jacková had already used PeerWise and Moodle Workshop at Matej Bel University before using Aropä. PeerWise is a "web-based tool that supports the authoring of multiple choice questions that other students can use and provide feedback on. (http://peerwise.cs.auckland.ac.nz)" (Hamer et al. 2011, 91). Moodle Workshop (Moodle plugin) is a tool "within Moodle enabling the creation and management of workshops, management of submission, grading and peer review" (Hamer et al. 2011 91). PeerWise was used for multiple-choice question creation and use by students at Matej Bel University (Jacková and Denny 2015; Jacková et al. 2016). Jacková also used Moodle Workshop at Matej Bel University for creating and peer reviewing artifacts of other types (e.g. essays, computer programmes). However, the system was not used much due to a lack of user-friendly and intuitive interface. Since the instructor had had no previous training regarding this tool, it was quite difficult to make a full use of the system and adjust it to the needs of both the instructor and students.

Aropä is a web-based "system that supports submission and allocation of reviewers, weighted grade calculation and distribution of feedback. (http://www.dcs.gla.ac.uk/~hcp/aropa/)" (Hamer et al. 2011, 91). Russell (2005) introduced another similar peer review tool for writing and critical-thinking called CPR (Calibrated Peer Review, see http://cpr.molsci.ucla.edu). According to Price et al. (2016, 020145-1),

"Calibrated Peer Review (CPR) is a web-based system that scaffolds peer evaluation through a 'calibration' process where students evaluate sample responses and receive feedback on their evaluations before evaluating their peers." However, CPR similarly to other peer review and e-learning platforms is not a free of charge system (for the price list, see http://cpr.molsci.ucla.edu/Purchase.aspx) and this makes Aropä more accessible and popular among instructors (Purchase and Hamer 2017).

After reading positive references for content creation and peer review tool Aropä (http://www.dcs.gla.ac.uk/~hcp/aropa/),the authors decided to try and test it in their courses.

Methods

The Aropä e-learning system was first used by the authors in the academic year 2016/2017 at the Faculty of Natural Sciences, Matej Bel University in Banská Bystrica (UMB), and at the Faculty of National Economy, the University of Economics in Bratislava (EUBA) (Jacko and Jacková 2017). At the UMB Faculty of Natural Sciences, Jacková started to use the Aropä system for peer review of semestral projects in three ICT-related compulsory courses:

Semester Project 1 (summer semester, 1st year of the Bachelor's degree programme Applied Informatics);

Semester Project 2 (winter semester, 2nd year of the Bachelor's degree programme Applied Informatics);

Informatics Didactics 2 (summer semester, 1st year of the Master's degree programme Computer Science Teaching in Combination with Subjects).

Based on positive preliminary experience with the use of the Aropä system at the UMB, Jacko also began using this system during the summer semester of 2016/2017 at the Faculty of National Economy EUBA, in the master's degree selective 6 credits course of *Ethics, Corruption and Transparency* which was attended by 71 students. The article will refer to him as "the instructor".

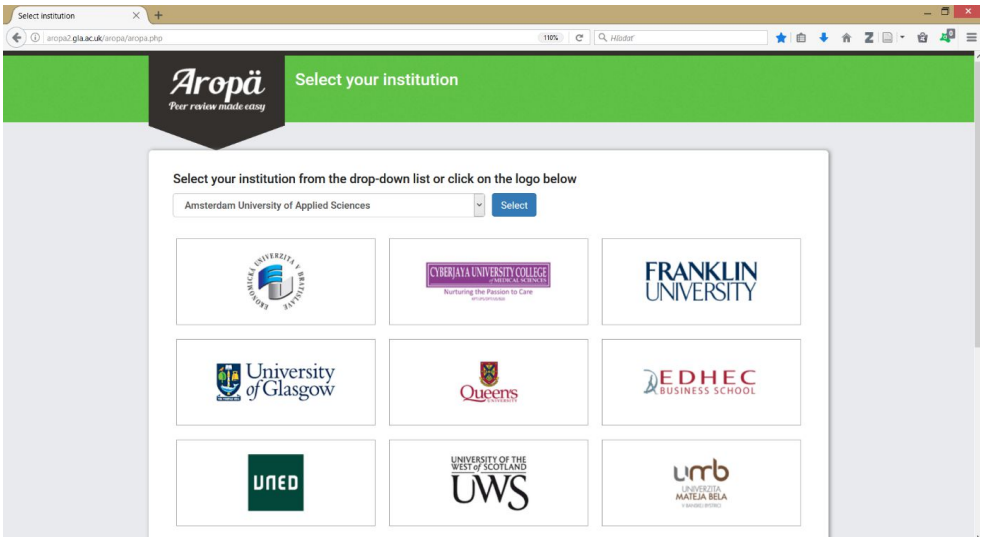
One of the main goals was to test whether and how ICT can be integrated as a teaching and learning tool in the course curriculum. After the authors successfully tested Aropä's use in an ICT-related course, the next step was to test its functionality in the field of economics and social sciences. Except for own observation as instructors and users, the authors tested overall satisfaction of students with Aropä and also asked some specific questions regarding the various features and functionality of the system. Furthermore, the aim was to test the use of regular essay writing and reviewing as a mandatory part of the final course assessment which was only introduced in the summer semester of 2016/2017 and it was made possible through Aropä. The authors distributed a student survey – feedback on Aropä to all 71 enrolled students. The return rate was 100% due to the fact that the survey was physically distributed to them at the end of the final exam and then collected and processed by the instructor. The survey consisted of standardised

questions designed by Purchase and Hamer, available for all instructors in Aropä. The authors translated these questions into Slovak and added their own questions regarding both Aropä and the course as a whole.

Overview and basic functioning of Aropä

Aropä is an online peer-review system that helps teachers to engage students in peer review activities. Teachers or instructors set assignments and students then upload them to the Aropä system – similarly to any other virtual learning environment (VLE) or e-learning platform such as Moodle, Blackboard, Canvas, etc. However, the system is rather limited in its focus and its key function is to provide feedback on the uploaded assignments through peer review. Aropä was developed, launched and is operated by Helen C. Purchase and John Hamer from the School of Computing Science, University of Glasgow. It is a completely free worldwide system regularly used in more than 20 universities around the world (Picture 1). The system includes a wide range of subjects and disciplines, ranging from anatomy, anthropology, biology and informatics to public administration, and veterinary medicine.

PICTURE 1.AROPÄ'S HOMEPAGE WITH LOGOS OF SOME UNIVERSITIES THAT USE THE SYSTEM



Source: http://aropa2.gla.ac.uk/aropa/aropa.php

Basic procedure for using Aropä:

1. The teacher creates an assignment and sets deadlines for both submitting the task for reviewing and feedback.

2. Students upload their assignment according to the set instructions and a deadline.

3. After the set deadline, the system automatically allocates assignments (instructors can adjust them manually if needed).

4. Students within another set deadline review the allocated assignment(s) and provide feedback according to feedback rubric (again created and adjusted as needed by instructors).

5. After completion of the review phase, students (authors) read feedback from their peers (reviewers).

The instructor taught the master's degree course of Ethics, Corruption and Transparency in the form of lectures (Mondays) and three seminars (Mondays, Tuesdays). The course was attended by 71 students. Since this was a selective module, all faculty and university master's students could have signed up for the course. As a result, students of 6 degree programmes attended the course (Public Policy and Regional Development, Finance, Taxes and Tax Advisory, Economic Policy, Social Policy and Social Development, Banking). The course focuses on the issues of defining and measuring corruption, its causes and implications (e.g. social, economic and political), the fight against corruption and international aspects of corruption. Compared to the previous academic year 2015/2016, when the instructor had taught the course for the first time, the course's assessment was slightly modified. Astudent now gets a maximum of 100 points (or 100% equivalent of the final course grade) for the following parts:

50%: one final exam;

30%: one mid-term test;

20%: weekly academic essays.

This paper will focus on the last part of the course assessment. All students had to prepare one essay per week with a word limit of at least 500 words according to the instructions. The essay always referred to the topic which was being discussed in the given week of the semester. Students were thus forced to actively and regularly work with mandatory and recommended literature. In the previous academic year 2015/2016 students also worked with the same reading list, but their weekly task was only to read and write notes. The teacher was physically checking these notes during the following seminar. The notes could have been either handwritten, printed or in electronic format. However, the authors noticed several negative reactions from the students not only during the semester but also in the students' feedback on the course. Some students did not see much sense in reading and taking notes. Our interpretation is that many of them stopped (or hardly ever started) reading academic literature and/or did not know how to effectively read and take notes. In addition, each student was used to his or her own style of notes: for some students it was enough to merely highlight key words and sentences in the given text, others were noting down too much information. Most importantly, while the authors were checking the notes and discussing their thoughts and opinions on the text, they found out that the students sometimes copied these notes from one another (the electronic form made it easy for them) and that writing even a detailed set of notes did not automatically mean that the student really understood the text.

Hence, the authors tried to improve both the content and the assessment process of the course before the beginning of the 2016/2017 session. Instead of regular, and for many dull and useless note taking, students had to regularly submit and upload their own academic (Anglo-Saxon style) essays into the Aropä system.

Furthermore, they had to review one another's essays and provide feedback. The innovation itself – i.e. active reading of literature; essay writing, reading, reviewing; but perhaps most significantly its regularity posed a completely new challenge for the students. Despite the fact that most of the students were already in the second (i.e. final) year of their master's degree, they had not experienced anything like this before. Nevertheless, the system was adopted well during the first weeks of the semester and students later considered weekly assignments to be a standard. In some cases students even asked for the essay topics a few weeks in advance when they knew that in a particular week they would not have enough time for them. This shows that some of them acquired and trained their planning and time management skills.

Slovak education system and in particular Slovak further education system is still heavily conservative and traditionalist in terms of the teaching methods. In March 2017, the Slovak Ministry of Education, Science, Research and Sport published a document "Learning Slovakia" (Burjan et al. 2017) in which it proposes a major reform of the Slovak education system. This should also include a greater emphasis on learning practical and transferable skills. Schools and universities should move from mere memorising and then regurgitating data to understanding, thinking and applying knowledge.

Using Aropä

Each assignment (i.e. essay topic) for a particular week was published in Aropä on Monday evening or Tuesday morning. The students had to write and upload their essays to Aropä by no later than Saturday 23:55 and then had to review two classmates' essays by Sunday, 23:55. This meant that they had always at least 5 days to write a short essay and one day to review two others.

Although Aropä is relatively limited in scope (uploading and reviewing assignments), it allows instructors to alter many settings according to individual needs. Options and features include (Purchase and Hamer 2017):

submission methods - uploading various file types (e.g. PDF, Word, ZIP, Excel, etc.);

allocation methods – setting number of assignments a student has to review;

reviewing methods - setting reviewers manually, randomly, adding external reviewers and editing review rubric;

individually manage extensions for submission and review;

restrict reviewing and receiving feedback to only those students who have already submitted and/or reviewed assignments;

anonymity – option to anonymize authors and/or reviewers;

backwards feedback - reviewing the quality of submitted reviews;

downloading all the submissions and reviews in a text document and all marks in a spreadsheet.

The authors set the system so that the students could only read and review two classmates' essays after they submitted their own essays. Then the students could see feedback and comments on their essays only after they completed the two reviews. This way, the students were motivated to submit both essays and reviews on time. Of course, essays and reviews were mandatory and part of the final course assessment but the authors wanted the students not to perceive the essays and reviews as something mandatory and hence "evil" but rather as a useful and interesting exercise and a way to acquire and master new skills.

The reason for having each student read and review two essays was to increase objectivity and the quality of the peer review process. This way the teacher saw any discrepancies and through that identified problematic reviewers who regularly reviewed essays significantly differently than the other automatically set reviewer. What is more, each student received 2 reviews that included different comments and tips for improvement even if they were given the same mark. The teacher designed the review process to be easy and fun. The reviewer had to answer the following two open questions and then rate the respective essay:

What do you like about the essay? Why would you praise the author?

What could the author improve in the essay?

Choose a mark for their essay from 0 to 100% (0 worst, 100% best).

Students evaluated the essays of their classmates on a scale of eleven points from 0 to 100%. In order to reconcile the perception of the essays' quality, a word description of all the marks was provided to the reviewers as a hint in addition to simple number. For example, 30% was described as "You're wasting my time!"; and 80% as: "Super! Interesting reading.". The authors tried to use the language which would be close to the students in order to make the review process more interesting and fun.

Requests, concerns and practical issues regarding Aropä

According to the Aropä system architects (Purchase and Hamer 2017), among instructors' most frequent requests and criticism has been a lack of integration of Aropä with either the particular university's student enrolment system or the university's learning management system (LMS). Purchase and Hamer also mention initial start-up learning costs among the few negative comments from instructors.

Based on our observation and use of Aropä, the authors would also appreciate integration with our universities' student and learning systems. On the other hand, this could be seen as a potential benefit due to the often obsolete and licenced nature of systems which are not easy to quickly adjust to instructors' needs. Responsiveness of LMS support staff and technical infrastructure can also pose a problem to smooth running of the system. Not all universities in the world can afford to have a fully integrated student enrolment and learning management system. Furthermore, it took the authors of this paper only a couple of hours to learn about the features and to get used to Aropä which proves its practicality and easiness.

In terms of students' feedback, according to Purchase and Hamer (2017, 19), many "students are apprehensive about peer review at first, but (they) have found the majority of them recognise the benefits after having taken part". They add that students "are sometimes sceptical of their peers' analytical and critical skills, and sometimes complain that what they really want is 'expert' feedback". What is more, based on our own experience, it is not realistic to expect that students will provide quality feedback on a voluntary basis. Thus it is necessary, for example, to link the assignment submission and reviews to the final assessment of the course. Ideally, feedback on student reviews should be provided by the instructor(s) but this is not possible in all cases due to the sheer number of students and the student-teacher ratio.

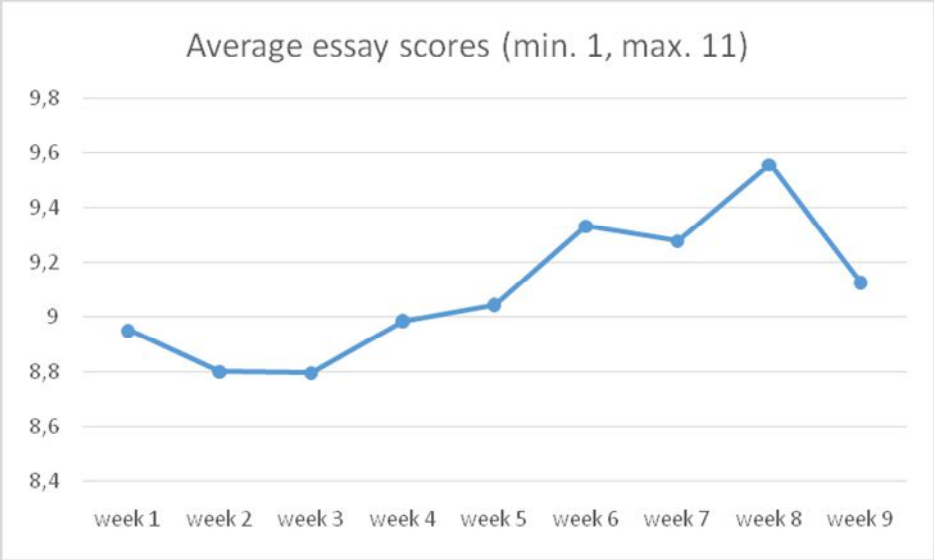
During the course of Ethics, Corruption and Transparency, the first and second weeks were naturally the most intense in terms of student concerns. Most students requested full anonymity both as authors and reviewers. The first assignment was not fully anonymous due to the fact that some students left their names either in the text or in the file name of the essay. The teacher then asked the students not to write their names anywhere in order to ensure the highest anonymization possible. Nevertheless, some students were still able to identify the authors by meta data (i.e. after downloading the file and checking the properties). Purchase and Hamer (2017) are aware of this issue and included it together with a number of other requests either on the unsatisfied requests list or on the wish list.

Among the very few technical issues that the authors have experienced was Aropä's incompatibility with the Slovak diacritics. Instead of the Slovak symbols in both the teacher's instructions and students' comments, Aropä displayed various numeric characters and hence it was not possible to read some words and comments. Students were then instructed to write comments without Slovak diacritics.

Perhaps the most common pedagogical problems were late submissions of essays mostly due to personal reasons, and high marks given by reviewers. However, these problems were not related to Aropä and all originated in students' behaviour. Thanks to the possibility to individually manage essay extensions in Aropä, late submissions were not a problem for the instructor and even helped him to keep a track record of those with granted extensions. However, as a result of high average marks for essays given by reviewers (see Chart1 below), the instructor decided not to take them into consideration in the final course grade. Instead, the 20% of the final course grade was awarded based on the number of essays submitted and on the number of nominations for "the essay of the week". As one of the students put it in the survey, "classmates were often not objective and I know that some of them, on principle, only gave 70% or 80%". Nevertheless, it can be argued that the quality of essays has improved over time – based on personal observation of the instructor and the average essay scores. Chart 1 below shows a steady increase in the average essay scores except for the last week which collided with master's dissertation submission deadline. More than half of the course students were in the final year and hence most likely prioritised their

duties in favour of finishing their dissertations. Hence, some students submitted an essay of lower quality contrary to their previous assignments.

CHART 1. AVERAGE ESSAY SCORES

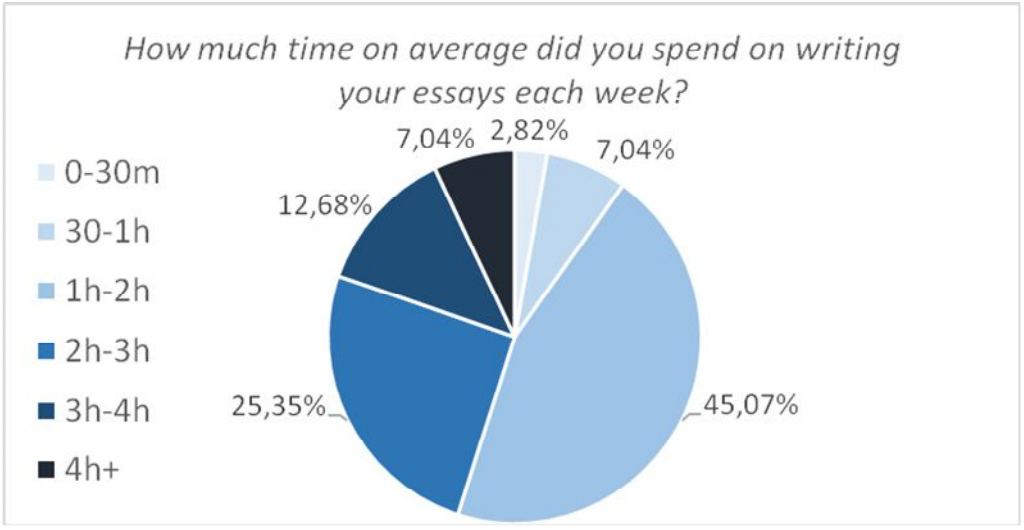


Source: authors

Among more significant pedagogical problems were plagiarism, gaming and free-rider problem, student motivation, and contradictory feedback. The authors have already discussed the common practice in the 2015/2016 academic year, when some students were copying other students' notes and pretended that this was their own work (i.e. free-rider problem). With 55 students last year it was very hard to detect those who were gaming or abusing the system and misusing the trust of the teacher. However, the new form of assessment and the peer review process posed a new challenge in terms of minimising these negative aspects of student learning. Hence, the authors came up with the following 4 preventable measures.

Firstly, one of the reasons for setting **weekly but rather short and easy assignments** (i.e. essays) was to prevent plagiarism and free-rider problem. Students were given essay topics and open questions often based on current issues and news articles. This way it was impossible to find an already existent essay or analysis on the Internet. Furthermore, students had to apply information from recommended reading to the discussed topic. With only 5 days to do but with a minimum word limit of only 500 words, the authors were hoping that students would find it easier to do the essay properly themselves rather than to look for any shortcuts. The authors expected most students would take up to 3 hours to write the weekly essay and the student survey confirmed this. Chart2 below shows that 80% of students took a maximum of 3 hours to write the weekly essay. Nevertheless, most students felt that this amount of time spent on weekly course preparation was too much (!) and that in terms of time demands, this had been one of the most difficult courses throughout their university studies. The authors will further discuss this issue in the Student survey section of the paper.

CHART 2. AVERAGE TIME SPENT ON WRITING A WEEKLY ESSAY



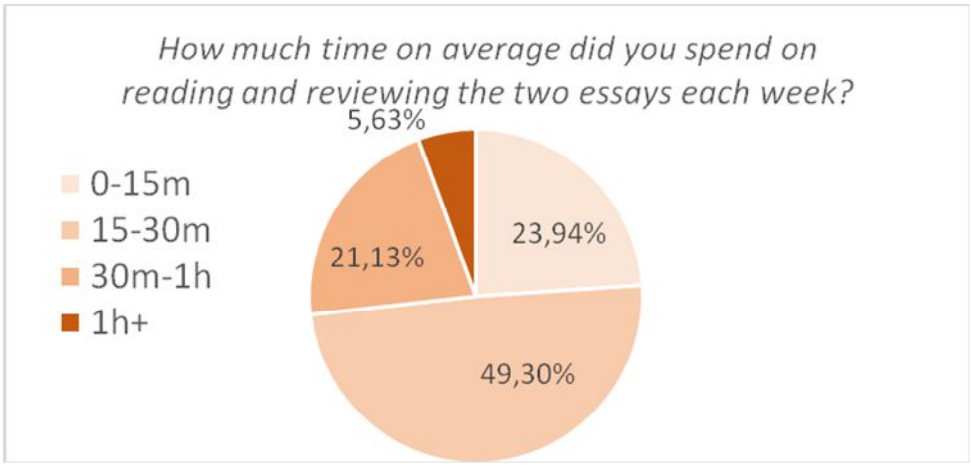
Source: authors

Secondly, in order to minimise the possibility and motivation of students to plagiarise or to game the system, the teacher each week **randomly chose and read at least 10** of the 71 submitted essays. This way, the authors kept track of the essay writing and students' progress. During 9 weeks, the instructor noticed only one case of plagiarism. This occurred in the last week's assignment. Interestingly, the last week saw the lowest number of submitted essays (64 out of 71) and a sudden drop in the average essay scores – as described above (see Chart 1).

Thirdly, the authors wanted to motivate students to write good quality essays and hence allowed all students to **nominate "the essay of the week"**. The teacher received between 1 and 8 essays each week and always chose one of them whose author was publicly given a symbolic prize and his or her essay was then shared with all other students. This way, other students could also read excellent essays and through that improve their own essay writing. What is more, these essay prizes and nominations were also considered during the final course assessment.

Finally, except for giving better quality and more objective feedback to students, one other reason for **reviewing 2 essays each week** by every student was to help the instructor to identify potential troublemakers. The instructor was not only going over a number of essays each week but thanks to Aropä, both authors were able to go over all reviews – both textual and numerical very quickly and efficiently. Having two reviews for each essay allowed the instructor to compare them quickly and detect potential free riders or underperforming students who needed our attention. Chart 3 below shows that 73% of students spent on average up to 30 minutes on reading and reviewing the two essays each week.

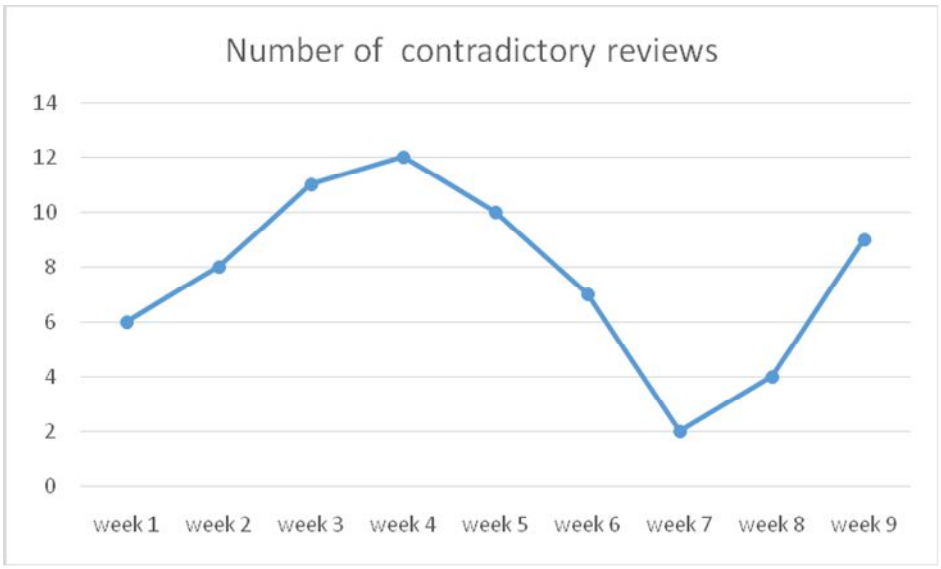
CHART 3. AVERAGE TIME SPENT BY STUDENTS ON READING AND REVIEWING ESSAYS



Source: authors

However, **contradictory reviews** posed the most serious problem. The problem of contradictory reviews or contradictory assessment is not so much related to the design and operation of Aropä as such, but it nevertheless results from its use. The authors considered contradictory reviews as those where discrepancy between the two numerical reviews (i.e. marks) was 3 points (equivalent of 30%) or greater (for example when one reviewer awarded 90% and the other reviewer only 60%). Aropä significantly helped and made it easy for the authors to identify these discrepancies due to its function which automatically calculates discrepancies between all the awarded marks. The number of contradictory reviews varied weekly from 2 in week 7, to 12 in week 4. The average number of contradictory reviews was 7.67. Considering the fact that there were 71 students enrolled in the course, the number of contradictory reviews was not significantly high. For more details, see Chart 4 below.

CHART 4. NUMBER OF CONTRADICTORY REVIEWS



Source: authors

Our goal was not only to make students learn and acquire new knowledge during the course, but also to learn different soft or transferable skills. One of them was to provide and receive both positive and

negative feedback. Even in the case of contradictory assessment, the students (i.e. essay authors) could still analyze the two different views on their essays and work out **why** two people evaluated their work so differently.

During the semester, the authors encouraged students to send their essays in case they felt that they did not receive fair or precise feedback. The instructor was contacted by a number of students each week (between 1 and 3) who received either contradictory reviews or both reviews were negative. In some cases, it was obvious that the review was poorly written most probably due to the fact that the reviewer did not invest the necessary time in both reading the essay and writing the review. On the other hand, several contradictory reviews also emerged which were all well-written and substantiated. In such cases, the instructor explained to students that their work can be perceived differently due to the various criteria which were set and which could have been perceived differently by reviewers. Among these was writing style, number and quality of sources used, elaboration of arguments and other predefined criteria. Some reviewers, for example, put more emphasis on the formal aspects of essays than others. Furthermore, the university course Ethics, Corruption and Transparency as a field of study and research belongs to the category of social sciences where it is virtually impossible to provide a perfect answer or to write a professional and flawless essay which is given 100% by all who read it. Social sciences encourage a wide range of opinions, often contradictory, controversial and hard to prove. Therefore feedback naturally may also be very diverse. But thanks to such contradictory assessment and feedback, students can learn to better understand, analyze and deal with different opinions - whether positive or negative - on their work. This skill will come very useful for students in both their private and later professional life. The results of the last question in the student survey confirm the overall usefulness of the peer reviewing experience (see Chart 9).

Student survey

The student survey confirmed benefits that Aropä and peer review process in general bring to students. The following Charts 5, 6, 7, 8 below show that a significant number of students agreed or strongly agreed that:

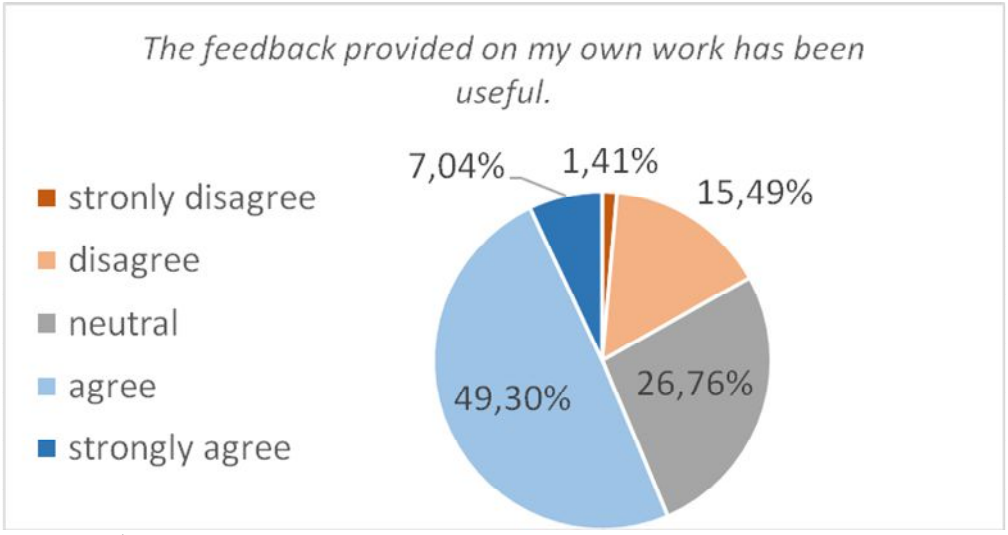
feedback provided on their work had been useful (56%; disagreed or strongly disagreed 16.9%);

peer reviewing improved their ability to reflect on their own learning and skills (50.7%; disagreed or strongly disagreed 15.5%);

peer reviewing improved their analysis and critical thinking (57.7%; disagreed 18.3%);

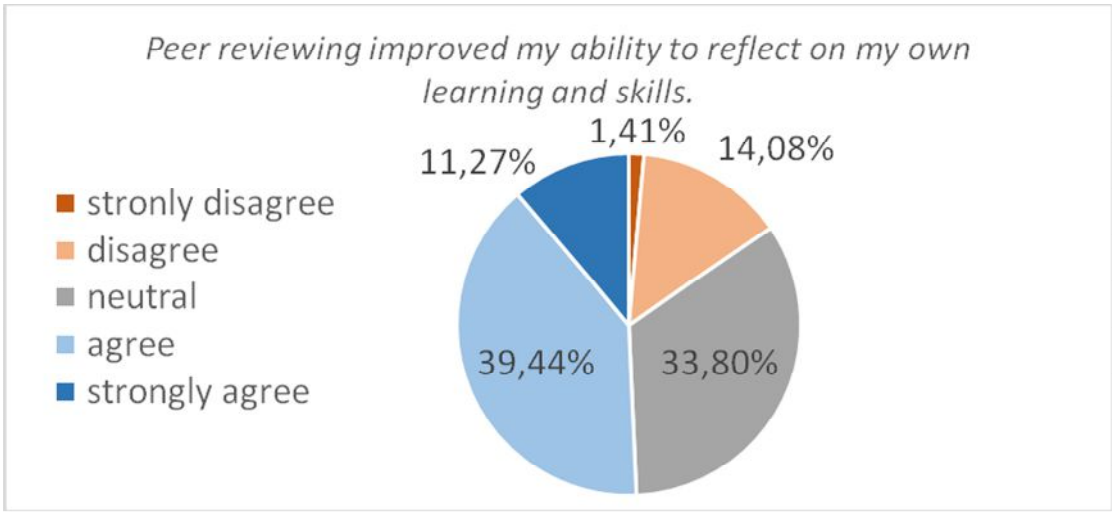
peer reviewing has helped improve their own work (62%; disagreed 19.7%).

CHART 5. STUDENTS' OPINION ON USEFULNESS OF FEEDBACK



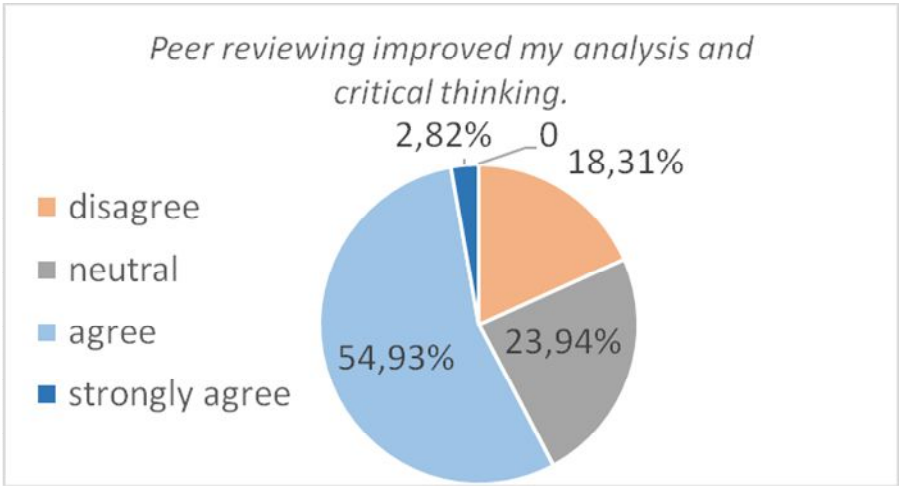
Source: authors

CHART 6. STUDENTS' OPINION ON IMPROVEMENT OF ABILITY TO REFLECT OWN LEARNING AND SKILLS



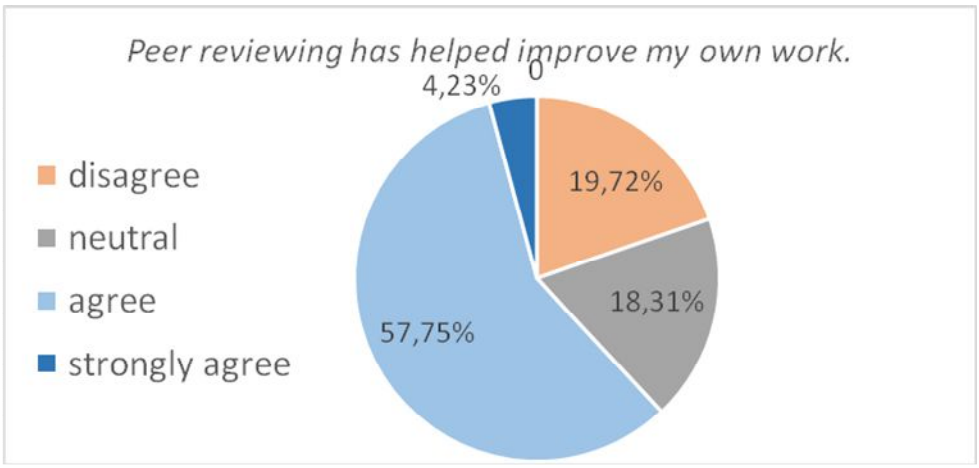
Source: authors

CHART 7. STUDENTS' OPINION ON IMPROVEMENT OF ANALYSIS AND CRITICAL THINKING



Source: authors

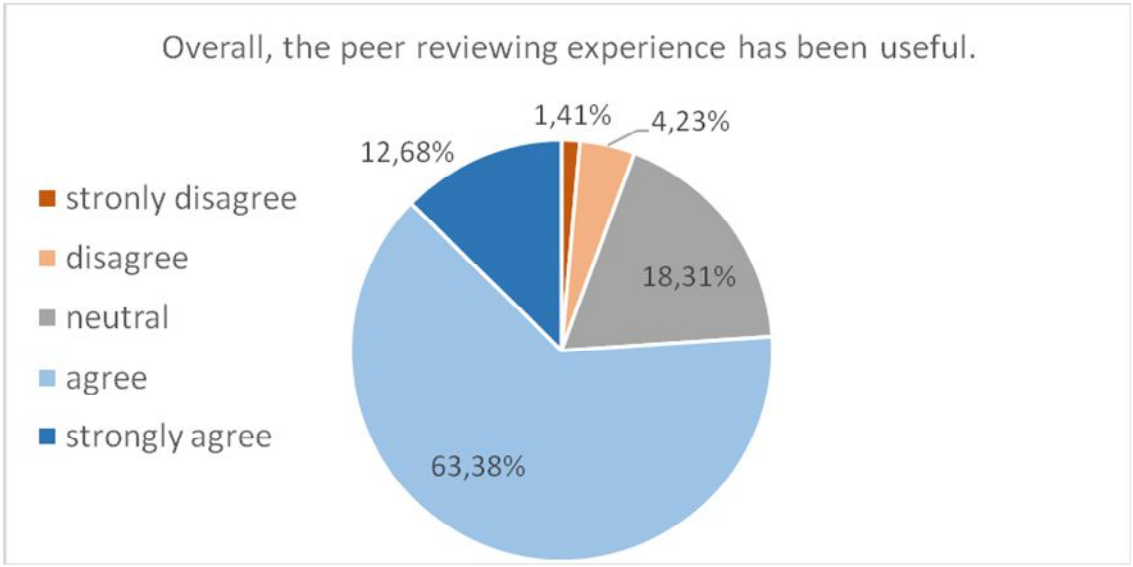
CHART 8. STUDENTS' OPINION ON IMPROVEMENT OF THEIR OWN WORK



Source: authors

Students were also asked to comment on the statement whether overall peer review experience has been useful. Chart9 shows that 76% of students either agreed or strongly agreed with the statement, only 5.6% of students either disagreed or strongly disagreed and 18.3% of students felt neutral about the statement.

CHART 9. STUDENTS' OPINION ON THE OVERALL USEFULNESS OF THE PEER REVIEWING EXPERIENCE



Source: authors

Similarly to Purchase and Hamer's (2017) observation, many students in the course were apprehensive about peer review at first, but later the majority of them – as evidenced in the conducted survey - recognised the benefits of the process. As mentioned earlier in the paper, most student criticism and concerns were aimed at missing diacritics, contradictory reviews and workload (more details below). On the other hand, students appreciated Aropä and considered it easy to use, clear, user friendly, functional and without any technical problems.

Writing weekly essays and spending 2 to 3 hours a week on reading, writing and then 15 to 30 minutes more on reviewing was perceived by students as way too much work. Students provided three main reasons why they thought so. Firstly, they had neither been used to nor they had experienced this sort of

regular and weekly assignments during any of their university courses except for this one. Secondly, most of the enrolled students were in their last semester of their master's degree and hence they had to work intensively also on their master's dissertation. Thirdly, the majority of students at the University of Economics in Bratislava already have professional part-time or full-time jobs and hence their job often takes priority over their studies.

The authors extracted textual responses from the student survey. Verbatim student comments regarding the peer review process and the Aropä system clearly illustrate overall satisfaction with the system. Students' comments include:

It's fine, we could use it for other things too. I would also include evaluation from the teacher because my classmates were often not objective and I know that some of them, on principle, only gave 70% or 80%.

The system was fine and easy to orientate it.

No concerns except for diacritics.

It had everything we needed. Maybe I would like to see some rankings and other features.

Quality system – only if it allowed to use diacritics.

Super easy and clear to use.

Missing diacritics, but othewise fine.

Easy for its purpose. I was very satisfied.

Interesting. It improves quality of learning.

10/10

Super system. I highly recommend it.

Positive. It simplifies learning and makes it more efficient.

A great website. It could be used more at EUBA.

Everything worked as it should.

I don't understand the technicalities but I think that the website was really well designed. I think that more teachers should use it.

Except for missing diacritics I don't have any negative remarks.

Fine. Easy, clear, functional.

It had its bugs (diacritics).

The system is great, easy, clear, precise. It's the users who are causing the trouble.

Can be. I would like to have the possibility to comment on the reviews or get rid of anonymity – or upon request show the names.

I liked the fact that I could compare two reviews on my essay.

Very good system. I really liked it. Good quality system.

User friendly. Interesting system. No problems.

Conclusion

Whether it is the major e-learning platforms such as Moodle, Blackboard, or more specific and simple web-based systems such as PeerWise or Aropä, all of them can have positive effects on cognitive and affective learning. Regular use of peer review systems can contribute to "improvements in student learning, greater interest in the subject, developing critical thinking, and gaining important personal skills for future life." (Jacková and Denny 2014, 6).

The authors began to test Aropä in the Slovak university environment in three courses at Matej Bel University in Banská Bystrica. The paper shows that Aropä has also proved to work wellat the University of Economics in Bratislava during the second year of the course *Ethics, Corruption and Transparency*. Aropä proved to be an excellent peer-review system which supported development of critical thinking and reflective skills in students throughout the semester. Furthermore, the authors took a risk and introduced an Anglo-Saxon style into the teaching and assessment of the course in an environment which is still heavily conservative and traditionalist in terms of teaching methods. Primarily, regular weekly essay writing and peer review through the Aropä system was introduced as one of the three modes of course assessment leading to the final course grade. Students had to write and assess their peers' essays – both a task and a skill that the Slovak university educational system does not prepare for. The risk paid off and the quality of essays has steadily increased over the semester. Both the teacher and the students found the web-based peer-review system useful and effective in delivering the course outcomes – both in terms of knowledge and skills.

For successful use of Aropä, it is crucial to make most out of the various options offered by the system. Also, the authors highly advise users and instructors to link the assignments and reviews to the final assessment of the respective course (i.e. make them mandatory), but also to motivate students and explain to them the clear benefits and skills that they will acquire and improve during the peer review process. Based on authors' experience with working with Aropä, they can only recommend the system to be used in higher education institutions in Slovakia and elsewhere. Flexibility and easy to use interface allow its use in other types of education where it is necessary to work with assignments, peer review and feedback from participants. For instance, Aropä could be used by teachers (i.e. participants) attending teaching skills trainings. Teachers could first learn how to work with the system from the student's

perspective and then implement the system in their own teaching and courses. This way, more teachers will be encouraged to innovate their teaching methods and will make their teaching more interesting and useful for their students.

Acknowledgment

This work was supported by the Slovak national VEGA project no. 1/0965/15.

References

Burjan, V., Ftáčnik, M., Juráš, I., Vantuch, J., Višňovský, E., Vozár, L., 2017. "Učiace sa Slovensko - Národný program rozvoja výchovy a vzdelávania [Learning Slovakia – National Programme of Training and Education Development]." Ministerstvo školstva, vedy, výskumu a športu Slovenskej republiky [Ministry of Education, Science, Research and Sport of the Slovak republic], Bratislava, March 2017, https://www.minedu.sk/data/files/6987_uciace_sa_slovensko.pdf, accessed on 15th May 2017.

Finlay, C., Tierney, A., McVey, M., and Gray, J., 2012. "Online peer review of scientific writing – Aropa." 5th Annual University of Glasgow Learning and Teaching Conference, http://eprints.gla.ac.uk/91940/, accessed on 15th May 2017.

Hamer, J., Cutts, Q., Jackova, J., Luxton-Reilly, A., McCartney, R., Purchase, H. C., Riedesel, C., Saeli, M., Sanders, K., Sheard, J., 2008. "Contributing student pedagogy." SIGCSE Bull 40(4), pp. 194–212.

Hamer, J., Luxton-Reilly, A., Purchase, H. C., Sheard, J., 2011. "Tools for "contributing student learning."" ACM Inroads 2 (2), pp. 78–91.

Huston, E., McVey, M., Welsh, M., McCallum, S., Deeley, S., Hau, L., Finlay, C., 2015. "Diverse use of the web-based peer assessment tool, Aropä, across the University of Glasgow." Scottish QAA Enhancement Themes Conference. Available at:

http://www.enhancementthemes.ac.uk/pages/searchresultdetails/docs/case-studies/diverse-use-of-the-web-based-peer-assessment-tool-aropa, accessed on 15th May 2017.

Jacko, T., Jacková, J., 2017. "Využitie e-learningového systému Aropä pri výučbe predmetu etika, korupcia a transparentnosť." [The use of Aropä e-learning system in teaching the course Ethics, Corruption and Transparency], in: Inovačný proces v e-learningu: recenzovaný zborník príspevkov z 10. vedeckej medzinárodnej konferencie. 27th April 2017, University of Economics in Bratislava. (in print)

Jacková, J., Denny, P., 2014. "Skúsenosti so študentami vytváranými a spravovanými bankami úloh [Experience with banks of tasks created and managed by students]." In: Inovačný proces v e-learningu: recenzovaný zborník príspevkov z medzinárodnej vedeckej konferencie [CD-ROM], Ekonóm, Bratislava, pp. 1–6.

Jacková, J., Denny, P., 2015. "Collaborative learning in PeerWise Web 2.0 technology." in: DisCo 2015: from analog education to digital education, Center for Higher Education Studies, Prague, pp. 25–30.

Jacková, J., Horváthová, D., Brodenec, I., Škrinárová, J., 2016. “Contributing Student Learning with the Peerwise Tool at the Matej Bel University.”, in: DIVAI 2016: 11th International Scientific Conference on Distance Learning in Applied Informatics, Wolters Kluwer, Prague, pp. 307–317.

Kubincová, Z., Homola, M., Dropčová, V., 2017. “Peer Reviews in a Web Design Course: Now Students like Them Too.”, in: Wu TT., Gennari R., Huang YM., Xie H., Cao Y. (Eds.) Emerging Technologies for Education. SETE 2016. Lecture Notes in Computer Science, vol. 10108. Springer, Cham, pp. 624-634.

MacDonald, D., 2013. “Online Peer Assessment in Undergraduate Physiotherapy Education.” Scottish QAA Enhancement Themes konference, http://www.enhancementthemes.ac.uk/docs/paper/online-peer-assessment-in-undergraduate-physiotherapy-education.pdf?sfvrsn=4, accessed on 15th May 2017.

November, N., 2011. “Literacy Loops and Online Groups: Promoting Writing Skills in Large Undergraduate Music Classes.” Journal of Music History Pedagogy, 2 (1), pp. 5–23.

November, N., Day, K., 2012. “Using Undergraduates' Digital Literacy Skills to Improve Their Discipline-Specific Writing: A Dialogue.” International Journal for the Scholarship of Teaching and Learning 6 (2), Article 5, https://do i.org/10.20429/i jsotl.2012.060205, accessed on 13th May 2017.

Patterson, D., 2009. “Two Peer Review Systems for Summative Assessment in a Green Processing Engineering Course”, Engineering Our Future: Are We up to the Challenge?, Burswood Entertainment Complex, Barton, ACT: Engineers Australia, 27–30 September, pp. 2281–2295.

Price, E., Goldberg, F., Robinson, S., McKean, M., 2016. “ValidityofpeergradingusingCalibratedPeerReviewinaguided-inquiry, conceptualphysicscourse.” Physical Review Physics Education Research 12 (2), https://journals.aps.org/prper/abstract/10.1103/PhysRevPhysEducRes.12.020145, accessed on 13th May 2017.

Purchase, H. C., Hamer, J., 2017. “Peer Review in Practice: eight years of experiences with Aropä.” School of Computing Science, University of Glasgow, Glasgow, http://www.dcs.gla.ac.uk/~hcp/aropa/AropaReportJan2017.pdf, accessed on 13th May 2017.

Russell, A. A., 2005. “Calibrated Peer Review™: A writing and critical-thinking instructional tool.” In: Invention and Impact: Building Excellence in Undergraduate Science, Technology, Engineering and Mathematics (STEM) Education, American Association for the Advancement of Science, Washington DC.

Welsh, M., 2014. “The impact of a new interactive anatomy curriculum for nursing students.” Higher Education Academy STEM Annual Conference.

THE LACK OF ELECTRONIC THESIS AND DISSERTATIONS (ETD) DATABASE AND ITS IMPACT TO DOING RESEARCH IN KOSOVO'S UNIVERSITIES

BEKIM BEKA

Faculty of Education
University of Ljubljana
Republic of Slovenia

ARLINDA BEKA

Faculty of Education
University of Prishtina
Republic of Kosovo

e-mail of corresponding author: Arlinda.beka@uni-pr.edu, Arlinda.beka@gmail.com

Key words: Electronic Thesis and Dissertations, ETDs, Research, University of Prishtina, Kosovo

Abstract: Electronic Thesis and Dissertations (ETD) databases play in important role in stimulating and providing resources for academic and scientific research worldwide. The researchers help to easily identify the preliminary research and case studies in these different fields of study. Kosovo is working hard in being in line with international trends and developments in educational science and academia. However no ETD databases are in place for master thesis and PhD dissertations. There is a lack of Electronic Thesis and Dissertations (ETD) databases at the level of university or its faculties. This research focuses on analyzing the reasons for the lack of such a database and the consequent consequences of its lack. It will present also the good practices of the various countries that practice the dissemination of electronic dissertations. This paper research will look into the importance and benefits of Electronic Thesis and Dissertations (ETDs) database and its impact to doing research. It will look into the reasons why it's not developed within Kosovo's universities, its gains and losses for conducting research in Kosovo.

This research was based on theoretical approach. This paper research we'll be based upon the contemporary research and prominent literature on the importance that Electronic Thesis and Dissertations (ETDs) databases play for research.

The findings of this research will serve to increase the scope for creating such databases for the Universities in Kosovo and will make the Ministry of Education reflect on the benefits that the education system in Kosovo can make from ETDs database.

Introduction

Importance of having Electronic Thesis and Dissertations (ETD) database in higher education institutions is acknowledged among the academia* worldwide. The development of modern information and communication technologies causes a change in the information infrastructures of higher education institutions and other research institutions (Schopfel et al. 2015).

With the level of digitalization they have become an important tool for enhancing research and helping new and emerging researchers in conducting researchers. It also help them and all the researchers to make they work known nationally and internationally especially through the open access repositories. Electronic theses and dissertations (ETDs) represent a growing segment of available content in institutional repositories where they contribute to the impact and ranking of their institutions (Ahmed et al. 2014).

Thesis and dissertation when they are accessible to wider audience they provide a very useful source of information, particularly at local or national level. It helps the new and emerging scientist to follow up and build further the research in particular field, based upon what has been done through previous researchers documented on Electronic Thesis and Dissertations (ETD).

* Term "Academia" is used to describe the scholars, university professors and researchers

Electronic Thesis and Dissertations (ETD) provides a documentation of professional and scientific work an institution has been develop over a period of time, which helps that institution to improve its ranking and build up its professional portfolio.

Authors, Ezema and Igbo (Ezema, Igbo 2016) consider that a major issue that is yet to be examined is the visibility of existing research in the region to the international research community. Therefore, they state that: "Theses and dissertations are very important research productions that are critical for sustainable national development." (Ezema, Igbo 2016). However it is important, to follow the contemporary trends of digitalization and ICT usage in every segment of life, and to incorporate the Thesis and Dissertations in new form of storing and disseminating them to wider audience. Due to those new possibilities that the internet and other information and communication technologies offer, and also to the scientists' and scholars' changing requirements, new distribution and dissemination channels appear in addition to the classical publishing houses. A leading development of the past years is the global Open Access movement that is committed to making scientific information, especially scientific and scholarly publications, available free of charge (Schopfel et al. 2015).

While now days the usage and importance of ETDs is acknowledged worldwide, its origins and the beginning date from the end of 1980. The concept of electronic theses and dissertations ETDs) was first discussed at a 1987 meeting in Ann Arbor, Michigan, organized by UMI and attended by representatives from Virginia Tech, the University of Michigan, and two small software companies (NDLTD). This was followed establishing of The National Digital Library of Theses and Dissertations in 1996. In 1998 interested institutions began meeting annually for what would become a series of symposia on electronic theses and dissertations sponsored by NDLTD and designed to help universities initiate ETD projects. The first symposium was held at the University of Tennessee Health Science Center, and since then, the gatherings have taken place at universities in North America, Australia, and Europe, with the first European venue being Humboldt University in Berlin, in 2003 (NDLTD).

The development of ETDs in the United Kingdom involves a project called "Theses Alive", which engages metadata creation of the management of TDs (Andrew, Jones 2003).

The increase in the adoption of ETDs in Italy occurred after the 2004 Messina Conference on Open Access, where most rectors of Italian universities subscribed to the Berlin declaration on Open Access, which was articulated in five sub-groups of International Theses Research evaluation (Gargiulo, Cassella 2009).

In France the initial creation of database started with creation of SUDO (Système Universitaire de Documentation or University Documentation System), the union catalogue of France's higher education libraries. SUDO was opened in 2001 and has proved a resounding success. It covers the collections of 1

419 member libraries along with the 1,793 public or private libraries from the SUDO-PS network which specialises in referencing serial publications. With over 10 million bibliographic records, 32 million localised documents and 24 million public queries in 2013, it plays a leading role in the French higher education and research information system (ABES, 2011).

In Germany the collection of ETDs at national level has started since July 1998 when the German National Library has begun collecting online dissertations and post-doctoral theses. Since 2011 ETDs can be submitted to the German National Library collects via the normal submission interfaces. The use of the "XMetaDissPlus" format makes it possible to collect publications offered on the university servers other than the university dissertations and theses themselves (Bibliothek 2012). Those national initiatives to develop ETDs Databases or repositories let o European wide project called DART-Europe (Digital Access to Research Theses - Europe).

DART-Europe started in 2005 as 18 months project. It is a partnership of research libraries and library consortia who are working together to improve global access to European research theses. DART-Europe serves as a European networking forum on issues relating to electronic theses. The DART-Europe partners share an enthusiasm for open access to research theses, and they have helped to provide researchers with the DART-Europe E-theses Portal, a service which enables the discovery of the open access research-level e-theses offered by institutions and consortia from a growing number of European countries (Moyle 2008).

Beyond European continent and the western hemisphere the National Digital Library of Theses and Dissertations – NDLTDs members today, include hundreds of universities around the world, as well as partner organizations—all working toward the goal of unlocking the benefits of shared knowledge for all (NDLTD).

Following this trend in building up repositories of ETDs database, most scientific and scholarly institutions have reacted positively to the development of Electronic Thesis and Dissertations (ETD) database or repository and have installed publication infrastructures in the form of so called document and publication servers, thus creating the possibility to make scientific and scholarly publications available online for a worldwide audience and to archive them (Schopfel et al. 2015).

The digital libraries of ETDs, as they are being used worldwide, are promising to be extremely useful to scholars, especially in developing countries. The greatest advantages of ETDs are avoiding duplication in research work, ensuring fast access of information, promoting resource sharing and providing a permanent solution to the problem of space (Swain 2010).

Through ETDs, researchers can promote their research work anytime, anywhere, access to information in line with the principles of open-access initiatives. Various authors, and have identified the benefits of ETDs in the area of scholarship to include students, academics, librarians, and academic institutions. ETDs

have been found to be indispensable tools for promotion of scholarly communication and open access initiatives. With ETDs, global recognition of researches and scholarly works are assured though the Internet (Ezema, Igbo 2016).

With the World Wide Web (www) science has created a communication tool that to a great extent is being used commercially. Despite the intensive use of the internet by academics in their everyday work the opportunities the web offers to improve scholarly communication are by no means exploited to their full extent. Electronic support of the whole scientific process is focused on more and more strongly: From first idea or draft to funding requests, to preliminary studies and experiments, questionnaires, measurements etc. to the publication of results and their application e. g. in patents or teaching scenarios (Schopfel et al. 2015). This has made the all process of doing research much easier, faster and easy accessible for wider audience. Adoption of ETDs is equally beneficial to the university faculty members. This is because ETDs assist research supervisors in enriching the standard of research conducted by their supervisees.

Greater visibility and a potentially higher recognition are characteristic advantages of electronic publications, especially when published Open Access (Schopfel et al. 2015).

ETDs apart from above mentioned benefits have been found to be a good source of increasing the web ranking and global visibility of the university. The international visibility increases the prestige of the university, making it relevant in the global scholarly environment. The internationalization of the university provides it the opportunity of attracting grants from national and international agencies, and this may to a large extent mitigate funding problems associated with universities in developing countries. Similarly, the global visibility of the university enhances the visibility of the researchers in the university as their works would begin to attract international attention in form of research collaboration and grants. In other words, ETDs showcase the research results produced by the institution, thereby raising the research profile and ranking of the university.

In this line Theses and Dissertations are considered an important part of information resources in any university. Traditionally, a thesis/dissertation has consisted of a written document formatted and bound much like a book. Often, access to these valuable unpublished resources is restricted to university community only. Most of the institutions do not allow photocopying, lending or distribution of theses and dissertations and they are often difficult to obtain in full text. However, with the recent advances in information and communications technologies and adoption of the

Budapest Open Access Initiative in 2002, learning and research institutions world over are engaged in creating ETD repositories with the aim of preserving and disseminating their intellectual output. So, the digital libraries of ETDs are promising to be extremely useful to scholars, especially in developing countries. The greatest advantages of ETDs are avoiding duplication in research work, ensuring fast access

of information, promoting resource sharing and providing a permanent solution to the problem of space (Swain 2010).

In 2000, UNESCO supported Virginia Tech in initiating an online guide of best practices for developing ETD programs. This 420-page document, The Guide for Electronic Thesis and Dissertations, collects articles by experts from all over the world, many previously published, on practical information and best practices for all areas of ETD development and implementation. (ETD Guide). This manual serves to document the ETD initiative and to address the concerns of universities hosting ETD repositories and students writing ETDs (UNESCO 2003).

"Given the emerging collection of ETDs, students as well as other researchers and even educators derive significant benefit. By and large, universities make ETDs freely available, and NDLTD services support centralized discovery. (...) Further, ETDs may help students identify topics that they can explore in conjunction with their own research. Many theses have sections that summarize open problems. Others suggest additional work that can be done to extend the recently completed study. According to one report, a student who prepared an ETD in South Africa was contacted by a student at the University of California, Berkeley, USA, who wanted to extend the first student's efforts" (UNESCO 2003). The technological advances today make it possible to think in terms of storing all the knowledge of the human race in digital form and several organizations worldwide are experimenting with less-expensive ways to archive and disseminate scholarly information and in-house knowledge as Institutional Repositories (Ahmed et al. 2014).

ETDs enhance students' skills in communicating their research findings as well as broadens their knowledge or understanding of the technical issues associated with writing research reports. They are enabled to express their research results in more creative and flexible ways and are aware of such issues as plagiarism and copyrights (Copeland, Penman 2004). Furthermore, ETDs raise the self-esteem of students. Apart from making them globally visible through the publication of their works, it improves the students' self-worth when their works are published on the global scene where other researchers can access and refer to them. Nonetheless, ETDs help the graduate students to acquire the technological skills and understand issues related to electronic production, publication, and communication of research findings (Ezema, Igbo 2016). ETDs have been found to be indispensable tools for promotion of scholarly communication and open access initiatives. With ETDs, global recognition of researches and scholarly works are assured though the internet (Ezema, Igbo 2016).

Methods

This research was based on theoretical approach. This paper research we'll be based upon the contemporary research and prominent literature on the importance that Electronic Thesis and Dissertations (ETDs) databases play for research.

The findings of this research will serve to increase the scope for creating such databases for the Universities in Kosovo and will make the Ministry of Education reflect on the benefits that the education system in Kosovo can make from ETDs database.

Results - Kosovo and Electronic Thesis and Dissertations

The situation with Electronic thesis and dissertations in Kosovo is different comparing to other European countries including those from the region. In some of the Balkans countries, Serbia (NARDUS 2011) Croatia (DABAR) etc. implementation of ETDs databases or repositories has taken place since few years. In Kosovo ETDs are still at the level of perceptive idea.

While the Law on Kosovo libraries emphasizes the role of National and University Libraries as the centre of scientific research in the field of library and information center in the national library (Article 17/4). Or, it emphasizes its role as the centre of the creation and maintenance of comprehensive catalogue, respectively of the database. (Article 17/7) having a purpose of establishing a digital archive for publications in the network library. (Article 17/20), or in a case of university library: providing services for students and teaching staff by giving the borrowing library materials and providing access to electronic information resources (Article 19/4) (Assembly of RKS 2012).

Theses and dissertations containing research and knowledge of students doing Master's Degree and PhDs at universities or higher education institutions are of primary importance for national database of research development and a tool for enhancing this research, it seems that relevant institutions in Kosovo have not taken into consideration development of ETDs repositories. It seems that their handling based on a form and access have not been changed and transformed since the establishment and application of doctoral programs in Kosovo (Rama 2011).

Rama, in here paper, has identified several facts about Theses and Dissertations in Kosovo: There is no ETDs as Theses and Dissertations are only on paper, placed on library shelves (Rama 2011). This limits access to general public as they are accessible only to scientific workers. Similar situation is at the university departments, where TDs are made accessible only to authorized members of university staff and external examiners for administrative purposes (Rama 2011). Here observations are not as optimistic as she states: "There is no foreseen initiative to deal with ETD projects since the main library of Kosovo lacks the necessary capacities to function as a sustainable institution similar to other national libraries and based on international standards. It has not been initiated, at least, yet any process to generate theses and dissertations entirely electronically, by using a word processor and/or electronically composed software, known as Born Digital Items. There is no plan yet to convert theses and dissertations into electronic files through scanning. There are no promises to create any digital databases, namely, create a digital archive of theses and dissertations. The dissemination of electronic Theses and dissertations on the Internet is not expected and planned in the near future" (Rama 2011). Since Theses and Dissertations belong to the

Special Collection at the National and University Library of Kosovo-NULK, this means they are preserved in closed stacks and they are usually non-circular, while only properly-qualified, interested researchers can have access. This makes them none useful to wider audience and unknown for most of new and emerging researchers. So far, the NULK library has no digital theses and dissertations, nor even in CD or any other digital format, (Rama 2011).

Also in the National Science Program of Kosovo (2010) which has been developed and approved by Kosovo's Assembly (NSCRK 2010) are set up 5 objectives: 1) Development of human capacity for research activities, 2) Development of research infrastructure, 3) Internationalization of scientific research activity, 4) Strengthening the links between science and society and economy for enhancing economic and social development, and 5) Excellence in research and scientific activity. (NSCRK 2010). While this strategic document provides a road map of future development of science and research for the period of 2010–2015, it has not foreseen creation of a national repository of researches, i.e. ETD database which could help store, publish, and promote research that leads to enhancing the science development in Kosovo.

The lack of awareness regarding the Electronic Thesis and Dissertations database or repository is seen also in the Strategy on Scientific/Artistic Research and Development Activities 2013–2016 (University of Prishtina 2012) which was developed with the participation of large number of university professors, scientists and researchers.

The Strategy focuses on four areas: Human resource, Infrastructure, International co-operation, Linking economy and society, recommending actions that need to be undertaken in order to implement the strategy. However there is now mentioning of the ETD repository and its impact to research development. (University of Prishtina 2012).

In a published report "The state of research in Kosovo" (RIDEA 2012) conducted by Research Institute of Development and European Affairs – RIDEA, whose main goal was to understand the presence and scope of the academic and scientific research in Kosovo. The importance and practical use of research results, including identification of present problems and recommendation of alternative and suitable solutions, there is no mentioning of ETDs and its relevance to research in Kosovo. The author(s) of the report interviewed most of prominent University Professors, members of National Research Council and high officials of Ministry of Education and Science. Yet none of them identifies the lack of ETD database as something that is hindering the development of research and its international promotion.

The challenge of using the online platform to publish/present researched done in Kosovo is seen even with the researches financed by MEST which are not published on MEST website or disseminated for a

wider audience. Center for Political Courage published a report on the state of implementation of the National Research Programme of the Republic of Kosovo (CPC 2013).

One of their recommendations related to scientific research was about making e sure that outcomes of the research projects supported by the MEST are uploaded on the web and disseminated to the academic community and policy-makers (CPC 2013).

In the area of scientific research Kosovo is behind other European countries: with 0.1 % of the GDP invested in research and with 826 publications indexed in two most prestigious databases (Scopus Main challenges and Web of Science) in the period 2003–2013, Kosovo is far from meeting the European standards for research development (MEST 2016). Moreover, in the past four years, within the Science Fund, MEST has supported research and science work through several grants schemes. The challenge remains to use these grants effectively (MEST 2016).

With the Action Plan for implementation of Kosovo Education Strategic Plan 2017–2021 (MEST-a) it is foreseen "Establishment of a national scientific researcher registry" (point 7.7.6). If this registry will consist with the names of researchers or it will include their research work will be known once it is developed (MEST-a).

Conclusion

While ETD's are widely accepted as a relevant factor in enhancing scientific research and supporting new and emerging research worldwide, in Kosovo this is still just an idea or a concept that needs to be considered for the future.

Due to lack of information and awareness of the benefits from having an ETD database, this is not included in the relevant and strategic documents related to Education.

This paper's aim was to increase the awareness on the benefits that come with establishing an Electronic Thesis and Dissertations database at the national level in Kosovo.

Recommendation

MEST:

- To reconsider ETDs database and the benefits that comes with it

- To initiate through its relevant departments creation of ETD by providing support for the National and University Libraries

Universities:

- To insist in publishing online and disseminating Thesis and Dissertations

- To develop open access for research conducted by faculty and students

Academia:

- To request access to previous research done at their institution

- To insist their work is uploaded and published at their institution and at the national level.

References

ABES, 2011. http://en.abes.fr, accessed on 13th May 2017.

Andrew, Th., Jones, R., 2003. "Theses Alive!: an ETD management system for the UK." 4th. Open Archives Forum, September 2003. [Presentation]. Bath, http://eprints.rclis.org/4747/, accessed on 15th May 2017.

Ahmed, A., et al., 2014. "Theses and dissertations in institutional repositories: an Asian perspective." New Library World 115 (9/10), pp. 438–451.

Bibliothek, D. N., 2012., http://www.dnb.de/EN/Wir/Kooperation/dissonline/dissonline_node.html, accessed on 16th May 2017.

CPC, 2013. "The state of implementation of the National Research Programme of the Prishtina: CPC".

Ezema, I. J., Igbo, H. U., 2016. "Electronic Theses and Dissertations and the Promotion of Scholarship in African Universities: Prospects and Challenges." International Information & Library Review 48 (1), pp. 21-30.

Gargiulo, P., Cassella, M., 2009. "Open Access in Italy." Rome: Open Access in Italy: report 2009.

Guide, E. (n.d.). http://www.ndltd.org/about, accessed on 15th May 2017.

Kosovo, A. o., 2012. http://www.kuvendikosoves.org/common/docs/ligjet/Law%20for%20libraries.pdf, accessed on 16th May 2017.

MEST, 2016. http://masht.rks-gov.net/uploads/2017/02/20161006-kesp-2017-2021-1.pdf, accessed on 16th May 2017.

MEST-a. (n.d.). http://masht.rks-gov.net/uploads/2017/02/20161006-action-plan.pdf, accessed on 16th May 2017.

Moyle, M., 2008. "Improving access to European e-theses: the DART-Europe Programme." LIBER Quarterly, 18 (3/4), pp. 413–423.

NDLTD. (n.d.), www.ndltd.org/about, accessed on 16th May 2017.

NSCRK, 2010. http://www.uni-pr.edu/desk/inc/media/33DA1FD8-AADE-461B-BE70-87C51D3CD4E1.pdf, accessed on 16th May 2017.

Rama, S., 2011. "Theses and Dissertations Management Overview in Kosovo." 14th International Symposium on Electronic Theses and Dissertations. Cape Town, South Africa. http://dl.cs.uct.ac.za/conferences/etd2011/papers/etd2011_rama.pdf, accessed on 16th May 2017.

RIDEA, 2012. “The state of research in Kosovo.” Prishtina: http://ridea-ks.org/Articles/1/43/Docs/2598RIDEA_Report_-_The_State_of_Research_in_Kosovo-_English_version.pdf, accessed on 16th May 2017.

Schopfel J. et al., 2015. “A French-German Survey of Electronic Theses and Dissertations: Access and Restrictions.” D-Lib Magazine March 2015.

Swain, D. K., 2010. “Global Adoption of Electronic Theses and Dissertations.” Library Philosophy and Practice.

UNESCO, 2003. “DIGITAL LIBRARIES IN EDUCATION.” Moscow: http://iite.unesco.org/pics/publications/en/files/3214609.pdf, accessed on 16th May 2017.

University of Prishtina, 2012. http://www.uni-pr.edu/desk/inc/media/3B8C64D7-B6FB-4D34-BF16-3039E80A8AC3.pdf, accessed on 16th May 2017.

VIRTUAL REALITY SYSTEMS FOR INTRODUCTORY BIOLOGY LABS: AN INTEGRATED SURVEY OF INDUSTRY SOLUTIONS

MILTIADIS LYTRAS, PARASKEVI PAPADOPOULOU

Deree The American College of Greece

e-mail of corresponding author: mlytras@acg.edu, vivipap@acg.edu

Key words: Virtual Reality Systems, Virtual Learning Environments (VLEs) Virtual Simulation in Biology, E-learning for Biology.

Abstract: Computer-based virtual simulations and other sophisticated teaching aids such as web-based learning applications, simulations and visualizations are being widely used for the purposes of teaching introductory biology courses focusing not only on laboratory experiments but also on use of virtual learning environments (VLEs) in the delivery of lectures so as to engage students better in the active learning process and in practical skills training. This paper investigates and explores the potential of VLEs in terms of the necessary concepts and principles that allow students to develop a more direct and meaningful experential understanding of the learning goals and outcomes of introductory biology courses. Virtual environments and intelligent tutoring agents or avatars support the rule of "learning by doing" and can effectively illustrate important concepts, principles and procedures in a flexible and self-learning manner. This paper is a literature review on Virtual Reality Systems pertaining to teaching University level Introductory Biology courses and discusses the process of the development of VLEs as a self-learning package in addition to providing an integrated survey of Industry Solutions. Various design strategies are proposed as a guide to a successful course design which enhance the learning process and ensure that the course goals and the important learning tasks are well covered and met.

Introduction

Nowadays, computer-based virtual simulations and other sophisticated teaching aids such as web-based learning applications, simulations and visualizations are being widely used for the purposes of teaching STEM courses and lab activities. Numerous studies and discussions on pedagogy in Higher Education (HE) point toward innovative and often interdisciplinary curricula with an integrative approach to learning focusing on innovative ways of teaching, promoting critical thinking, group work, collaboration, cultivating problem solving and development of transferable skills but most importantly attempting to transform learning to a pleasant life long experience.

The authors of this paper have long experience in teaching lower and upper division courses mainly from the disciplines of Biology, Information Technology and Information Management Systems. We have been exposed as students not only to traditional educational practices which are mainly instructor-centered but also we were also lucky to have had outstanding teachers ourselves who applied student-centered practices. In those cases, the instructors act as mentors or facilitators of the learning process. The students are taught to be more actively engaged and are informed that they are not passive recipients of knowledge but participants of a learning process that is based on mutual respect, transparency, flexibility, responsibility and possess a high sense of course ownership. The connection of the teaching/learning experience with the needs of society and the various challenges graduates face when looking for satisfactory jobs upon graduation is emphasized often through community service learning and internships leading to transformative teaching and learning.

We are using as a case study introductory biology courses focusing not only on laboratory experiments but also on use of virtual learning environments (VLEs) in the delivery of lectures so as to engage students better in the active learning process and in practical skills training. This decision is the result of a very

successful collaboration between the authors for the past two years on Higher Education (HE) active learning research and innovative ways of teaching, student evaluation and assessment. This collaboration together with a few more colleagues from our institution has led to a number of publications mostly focusing on active learning/teaching issues and methods used, student evaluation and assessment, issues of sustainability, service learning, research based learning and other ways that add value to Higher Education which at the present time, worldwide, faces a multidimensional transition (Misseyanni, Marouli, Papadopoulou., Lytras 2016; Papadopoulou, Lytras, Marouli 2016; Marouli, Misseyanni, Papadopoulou, Lytras 2016; Misseyanni, Gastardo 2016; Misseyanni, Daniela, Lytras, Papadopoulou, Marouli 2016). In all of our studies we have proposed innovative ways of teaching, learning and assessment that improve student engagement, participation and the sense of course ownership contributing to the wider student learning experience. Our contribution so far is to improve professional standards frameworks which require institutional and administrative commitment on raising the teaching standards, ensuring professional development of educators, adopting best teaching practices and promoting well trained and educated leaders.

In our present day knowledge society, the goal is for more people to conceive knowledge as the lever to innovation that leads to progress available to all and thus Higher Education organization, teaching methods and practices need to be reexamined. As we have previously stated in one of our articles (Papadopoulou, Marouli, Misseyanni, Lytras 2016), "active and experiential learning it is not new for experts in education (Montessori 1989; Dewey 1997), learning in the field, education not only *on* the environment (knowledge transfer) but also *in* (engaging students also emotionally) and *for* the environment (aiming to a healthy environment) (UN Tbilisi Declaration 1977; United Nations 2015), or even education that empowers learners not only as learners but also as members of the society (Freire 1996)." We need to also keep in mind that student perception of what constitutes active learning, group work or collaboration, scholarship, internships, research and various additional ways of active and service learning is vague. To be able to integrate all these elements into Higher Education teaching and learning process becomes a great challenge at the administrative level, at the educator's level and at the student level. It is a value chain process that requires careful planning, commitment, allocation of adequate resources together with a great deal of enthusiasm and respect for all stakeholders. Only this way, the future citizens of the world will not only be well trained and empowered with knowledge in their field of expertise but will also be better equipped with high values to create a better and sustainable world.

In the present paper we present use of "traditional" ways of teaching the introductory courses of biology blended with "innovative" ways of teaching both lectures and mostly lab activities mainly through the use of Information Communication Technologies (ICTs) as an essential driver to raising the status and quality of the course. We also discuss how the students will meet the competencies and specific learning outcomes

of the content to be covered in what is considered a survey course. The course syllabus is continuously redesigned to better serve the needs of the present day students by taking into consideration innovative ways of teaching that include but not limited to: problem solving, active learning discussion and collaboration, game based learning, use of case studies, integrating research to the learning process, flipped classroom and in general wider use of ICTs such as various devises, platforms and sites developed for biology either by publishers or university educational sites, animations, videos, films etc.

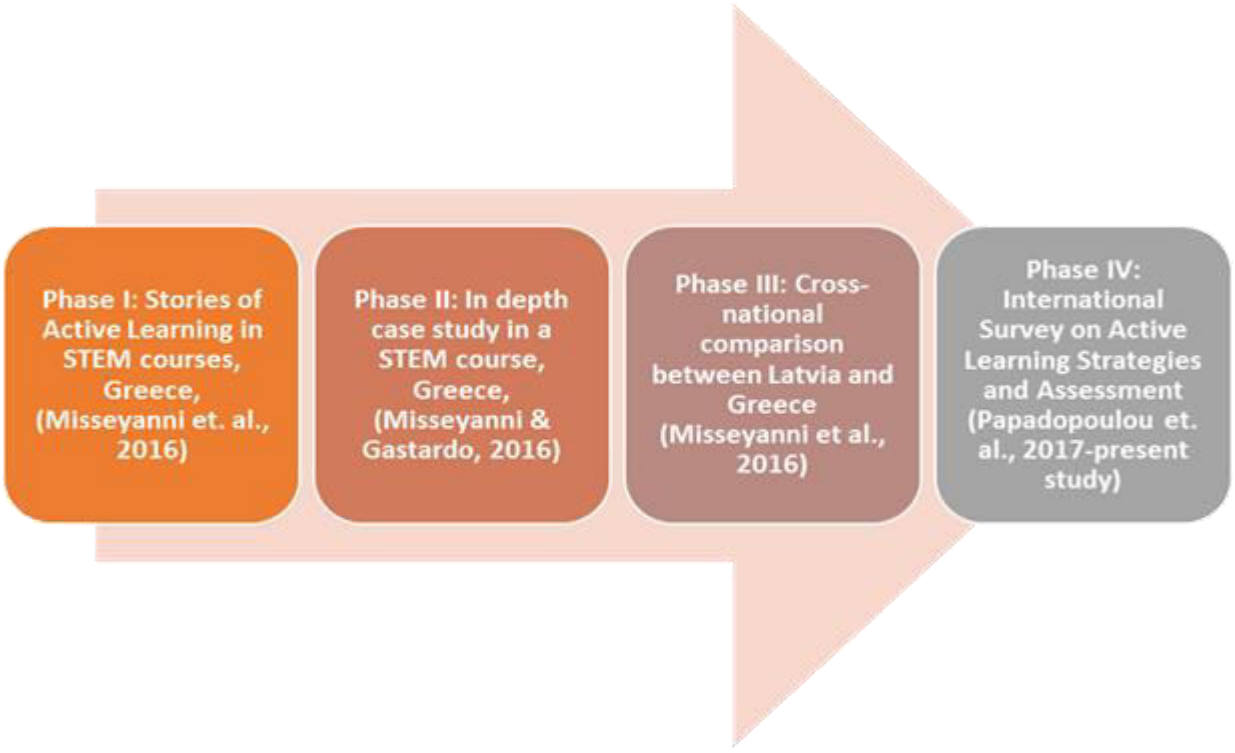
This paper also investigates and explores the potential of VLEs in terms of the necessary concepts and principles that allow students to develop a more direct and meaningful experential understanding of the learning goals and outcomes of introductory biology courses. Virtual environments and intelligent tutoring agents or avatars support the rule of "learning by doing" and can effectively illustrate important concepts, principles and procedures in a flexible and self-learning manner. Furthermore, this paper is a literature review on Virtual Reality Systems pertaining to teaching University level Introductory Biology courses and discusses the process of the development of VLEs as a self-learning package in addition to providing an integrated survey of Industry Solutions. Various design strategies are proposed as a guide to a succesful course design which enhance the learning process and ensure that the course goals and the important learning tasks are well covered and met.

Methods

This paper is part of a larger group research project which examines instructors' experiences and perceptions of Active Learning Strategies, Collaboration, Co-teaching, how Research informs teaching, Student Evaluation and Assessment in Higher Education with focus on STEM disciplines. The first results of our effort to identify active learning strategies used in STEM courses in Greece were presented in the '6th Future of Education Conference-Florence Italy, 2016' (Misseyanni, Marouli, Papadopoulou., Lytras 2016; Papadopoulou, Lytras, Marouli 2016; Marouli, Misseyanni, Papadopoulou, Lytras 2016). This effort was further enriched with an in-depth case study (Misseyanni, Gastardo 2016). Our research team then proceeded with a cross-national comparison between Latvia and Greece where thirty academics and researchers in Greece and Latvia responded (Misseyanni, Daniela, Lytras, Papadopoulou, Marouli 2016) see Picture 1. One more paper from our group is to be presented at DisCo conference 2017 on 'Open education as a way to a knowledge society' and four additional papers of our team are to be presented in July 2017 at the 9th annual International Conference on Education and New Learning Technologies, Barcelona (Spain), 2017. We have conducted qualitative research surveys with the participation of academics from universities worldwide in regard to educational objectives, and the need to revise this typical approach to teaching, evaluation and student assessment with more elements and more dimensions taken into consideration. We have also published two editorial articles both related to active learning in

general and in engineering (Lytras, Alhalabi, Torres Ruiz, Papadopoulou, Marouli 2016); Papadopoulou, Marouli, Misseyanni, Lytras 2016).

PICTURE 1. PHASES OF THE RESEARCH PROJECT ON ACTIVE LEARNING STRATEGIES IN HIGHER EDUCATION



Source: Own

This paper is a literature review on Virtual Reality Systems and on traditional and innovative ways pertaining to teaching University level Introductory Biology courses and discusses the process of the development of VLEs as a self-learning package in addition to providing an integrated survey of Industry Solutions. Various design strategies are proposed as a guide to a succesful course design which enhance the learning process and ensure that the course goals and the important learning tasks are well covered and met. It proposes a multidimensional model of student active engagement and presents various integrative qualitative factors that can serve as a proposed vision for the next decades.

Results

The two course syllabi developed for Introduction to Biology I and II can be accessed from the following site: http://www.acg.edu/dereeacg/files/pdfs/BI1000.pdf with the following catalogue description for BI 1000: *"An integrated exploration of the fundamentals of biology as a science, the nature of life, biological chemistry, cell biology, metabolism and human body anatomy and function"* and for BI 1101 http://www.acg.edu/dereeacg/files/pdfs/BI1101.pdf "*An integrated exploration of major principles of biology. Emphasis on diversity of life, development, cell division, molecular biology, genetics, evolution, and ecology. Consideration of issues and applications related to society."*

The main textbook used for the introductory two courses in Biology I and II is the latest edition (15th) of *Inquiry into Life* by Dr. Sylvia Mader plus the same edition Laboratory Manual (Lab Manual) which are also available in electronic form.

Evaluation of past teaching methods

Our literature review and personal experience points to the following problem:

- **Problem:** STEM students lose interest as they have too much information to remember and yet are expected to develop and progressively deepen understanding of core ideas and principles, tools and strategies and to build the key STEM-relevant skills for various applications and to prepare themselves for future jobs. (Barrows, Tambling 1980; Velegol, Zappe, Mahoney 2015; (Santora, Mason 2013).

Whereas with the use of Active Learning methods the engagement of students increased by utilizing an integrative approach via problem solving learning, (PBL), various ICTs, more direct contact with the teacher/mentor and full engagement. (Lytras, Zhuhadar, Zhang, Kurilovas 2014; (Lytras, Mathkour, Abdalla, Yáñez- Márquez, Ordóñez de Pablos 2014); (Lytras, Mathkour, Abdalla, Al-Halabi, Yáñez-Márquez, Siqueira 2015).

So, how do we do it? For years we try to integrate a tested, traditional learning system with modern digital and pedagogical approaches designed to stimulate and engage today's student see table 1 below:

TABLE 1. INTEGRATING FEATURED READINGS WITH QUANTITATIVE ANALYSIS AND DIGITAL CONTENT
Focus on the relevancy of biology to our everyday lives
A series of new feature readings exist that have a human focus and appear in the news
Reading are supplemented by a series of questions that instructors may use in promoting conversations
Readings can also promote one-minute papers
A new style of digital multipart questions are assignable within Connect
Students can explore the quantitative aspects of topics, such as analyze graphs and inquire into trends in data

As seen in table 2, students can improve the effectiveness of their learning by integrating the digital assets of today's courses into their study habits. Proper use of course management systems such as Blackboard, LearnSmart™ and Connect®, McGraw-Hill's flagship digital tools, and more recently Virtual Reality Systems can increase student preparedness and retention. As educators we recognize that students today are digital learners and virtually all material taught can be integrated with various media assets. For topics such as photosynthesis and cellular respiration, McGraw-Hill has produced a series of dynamic 3D animations that may be used both as presentation tools in the classroom, and as mini-tutorials that can be assigned within Connect or our course management system. The ScienCentral videos provided are short news clips on recent advances in the sciences and additional three- to five-minute audio files serve as a review of the material in the chapter, and they also assist the student in the pronunciation of scientific terms. The National Geographic videos provide students with a glimpse of the complexity of life that

normally would not be possible in the classroom. The Virtual Labs are simulated experiments that serve as excellent tutorials, allowing students to explore further the topics covered in select chapters of the text. The guided short 2–3 minute tutorials are very useful for more difficult topics in the text.

TABLE 2. MEDIA INTEGRATION
Blackboard, LearnSmart™ , Connect®, McGraw-Hill's flagship digital tools, Virtual Learning Systems
McGraw-Hill's new 3D animations are integrated into the more difficult chapters
MP3 files, animations of biological processes, and National Geographic and ScienCentral videos.
Three- to five-minute audio files
3D Animations and Drawing on McGraw-Hill's vast library of animations
Videos
Virtual Labs
Guided Tutorials

In table 3 various Media Study Tools are shown from those provided to students partly within their course syllabus and course outline and mostly within the blackboard course management system. The link to the *Inquiry into Life* website, which contains practice online tests, animations, and videos organized and integrated by chapter greatly helps students succeed in their study of biology. Moreover, access to ConnectPlus or LearnSmart system is very useful. The Learning Outcomes per chapter provide students with an overview of what they have to achieve and point out candidate essay questions for the exams. The Chapter Outline provided not only lists the major sections that will be discussed in the chapter but being like a summary students find it useful to keep notes while attending the lecture. The lecture ppts provided by the instructor are also very useful. Virtual Labs for selected chapters are used extensively either as tutorials that certainly improve understanding or offering the opportunity to properly prepare students for the actual lab activity or provide the opportunity to investigate topics that could not be covered otherwise. The use of case studies is designed to demonstrate how the chapter content is relevant to our life and help students thinking of their progress through the chapters.

TABLE 3. MEDIA STUDY TOOLS CURRENTLY USED. AN INTEGRATION OF TRADITIONAL AND INNOVATIVE TOOLS
Link to the *Inquiry into Life* website and eBook
Chapter Learning Outcomes
Chapter Outline
The ConnectPlus® platform provides a mediarich eBook, interactive learning tools
Access to the LearnSmart™ system
Virtual Labs
3D Animations and Drawing on McGraw-Hill's vast library of animations
Videos
Guided Tutorials
Case Studies

Table 4 presents a number of useful student resources and virtual laboratory exercises links that currently the students are using for their studying and their lab activities

TABLE 4. BI 1000 AND BI 1101 USEFUL STUDENT RESOURCES AND VIRTUAL LABORATORY EXERCISES
http://highered.mheducation.com/sites/1259426165/student_view0/student_resources.html http://www.mhhe.com/biosci/genbio/virtual_labs_2K8/ http://www.mhhe.com/maderinquiry14 http://www.whitman.edu/biology/vpd/
http://www.dnalc.org
http://www.medtropolis.com/VBody.asp
http://www.cellsalive.com/
http://multimedia.mcb.harvard.edu/media.html
http://www.mcb.harvard.edu/BioLinks.html
http://www.mhhe.com/biosci/esp/2002_general/Esp/default.htm
http://nhscience.lonestar.edu/biol/bio1int.htm
http://biology.uco.edu/AnimalBiology/Tissues/Tissuhome.html
http://www.sciam.com

In table 5, we show links where students of BI 1000 from within the discussion board of the blackboard management system are asked to explore the following Virtual Reality or 3D videos and animations related mostly to their lab work and to feel free to add any other interesting links they may discover themselves. They are encouraged to engage in discussion with their classmates and share their experience.

TABLE 5. LINKS ON VIRTUAL REALITY OR 3D ANIMATIONS, SIMULATIONS OF HUMAN BODY AND ORGAN ANATOMY
Visible Body | Virtual 3D Heart Dissection with Human Anatomy Atlas
https://www.youtube.com/watch?v=9I-XcW0XXzg
How the Heart Works 3D Video.flv
https://www.youtube.com/watch?v=oHMmtqKgs50
HCL Learning DigiSchool – Structure of the Human Heart
https://www.youtube.com/watch?v=qmpd82mpVO4
Human Circulatory System
https://www.youtube.com/watch?v=_qmNCJxpsr0
Heart Bypass Surgery (CABG)
https://www.youtube.com/watch?v=3Nf6Q2skGOM
The Unfixed Brain
https://www.youtube.com/watch?v=jHxyP-nUhUY
Human Physiology – Functional Anatomy of the Male Reproductive System
https://www.youtube.com/watch?v=v22CjFYizi0
Learn About the Male and female Reproductive Systems
https://www.youtube.com/watch?v=J8n2hmhiQL8
Female Reproductive Model
https://www.youtube.com/watch?v=DKxJqz_3dls
female reproductive anatomy.mp4
https://www.youtube.com/watch?v=D8rN1xiQbSU
Male Reproductive Anatomy
https://www.youtube.com/watch?v=6KfaqluIolc
Male Reproductive Anatomy Review
https://www.youtube.com/watch?v=4p5QZIBXP1E
Visible Body | Virtual 3D Brain Dissection with Human Anatomy Atlas
https://www.youtube.com/watch?v=Qqb4pOykRag
Visible Body | Human Anatomy Atlas 2017 Walkthrough with Robb Kneebone
https://www.youtube.com/watch?v=6SR7qbeulEM
What's in the App? (iPad, Android tablet, PC, and Mac) | Visible Body
https://www.youtube.com/watch?v=GDXVEYe7360&list=PldXA_22wH-Kjo08KyjfMojAge34zhZz8C&index=2
Structure and working of Human Eye
https://www.youtube.com/watch?v=Betdh-G8wFE
How the ear works
https://www.youtube.com/watch?v=qgdqp-oPb1Q
Spinal Cord Model.mov
https://www.youtube.com/watch?v=3vnVxdhDNzQ
The Physiology of the Eye: VR Education for the HTC Vive: Play through – Doctor Yak
https://www.youtube.com/watch?v=Jys5Wwrnzq8

But the whole world is changing very fast. New technological advances have for the first time changed the way we teach STEM courses and biology as in this particular case. Virtual Reality and augmented reality have already transformed education and this will soon become obvious to everyone. In table 6 we

have put together a number of Virtual Reality Systems for Biology in particular and various industry solutions are shown that will definitely transform the way we teach biology.

TABLE 6. VIRTUAL REALITY SYSTEMS FOR BIOLOGY AND INDUSTRY SOLUTIONS
EDUCATIONAL TECHNOLOGY - Virtual Reality And Augmented Reality In Education https://elearningindustry.com/virtual-reality-augmented-reality-education
'World of Comenius' Demonstrates Powerful Educational Interaction with Leap Motion and Oculus Rift, By Paul James - Oct 17, 2014 6 http://www.roadtovr.com/world-of-comenius-education-interaction-virtual-reality-oculus-rift-leap-motion/
ER VR-Virtual Reality Medical Training on the Samsung GearVR http://immersivevreducation.com/faq/
Alchemy VR is one of the world's leading VR studios, creating VR 3D experiences and films http://www.alchemyvr.com/
The zSpace Learning Lab http://zspace.com/
Oculus Rift CRUNCH NETWORK When Virtual Reality Meets Education Posted Jan 23, 2016 by Elizabeth Reede (@ElizabethReede), Larissa Bailiff (@larissa_bailiff) https://techcrunch.com/2016/01/23/when-virtual-reality-meets-education/
Cyber Science 3D (Formerly known as Cyber-Anatomy Corp. and Viz-Tek, Inc.) was founded in 2007 in Iowa City, IA USA. http://cyberscience3d.com/#_ga=1.116861007.816810246.1491933296
Cyber-Anatomy Med™ is the world's most advanced medical-level anatomy software. https://www.cyber-anatomy.com/product_CAHA_med.php
VIRTUAL REALITY IN MEDICAL EDUCATION Cyber-Anatomy Corporation is the world leader in developing and marketing educational content. Cyber-Anatomy has developed revolutionary technologies to increase student learning, faster, and better. It has a proven scientific record of achieving success as demonstrated by the US National Science Foundation. http://www.bertas.com.tr/virtual-reality-education-modalities.68.en.html
Legit "Full-Body" Virtual Reality - Omni by Virituix at CES 2015 https://www.youtube.com/attribution_link?a=jeq0BSWjMJA&u=%2Fwatch%3Fv%3DuFJ4CTc8oy8%26feature%3Dshare
Project Esper: Mixed Reality Anatomy Learning https://www.youtube.com/attribution_link?a=23IEH7RNGKQ&u=%2Fwatch%3Fv%3D3qpgMLzBi30%26feature%3Dshare
Visible Body and zSpace Partnership Announcement https://www.youtube.com/attribution_link?a=Sk4cdGoaLZs&u=%2Fwatch%3Fv%3D4D8hb0kE6UQ%26feature%3Dshare
Human Anatomy through Virtual Reality https://www.youtube.com/attribution_link?a=ZjpOn2sY77A&u=%2Fwatch%3Fv%3DCbynyhJ2PI0%26feature%3Dshare
Anatomy VR - Trailer - Unimersiv https://www.youtube.com/attribution_link?a=3_KkvJFQaKo&u=%2Fwatch%3Fv%3DdDeReePvCc0%26feature%3Dshare
Exploration of the Body - Virtual Reality Testscene https://www.youtube.com/attribution_link?a=y3dEZokZS60&u=%2Fwatch%3Fv%3D0Tp4LtdJ1MQ%26feature%3Dshare
The Body VR: Journey Inside a Cell - 360 Gameplay https://www.youtube.com/attribution_link?a=cTNv8YVf3Kc&u=%2Fwatch%3Fv%3D9zTsDXMyBEY%26feature%3Dshare
LINDSAY VR Body Gallery https://www.youtube.com/attribution_link?a=1e459BYqq7A&u=%2Fwatch%3Fv%3D4EneKzIpcOw%26feature%3Dshare
THE FUTURE OF EDUCATION IS HERE! | The Body VR (Oculus Rift DK2) https://www.youtube.com/attribution_link?a=GxtKTY8wWZ0&u=%2Fwatch%3Fv%3DuG0u7_gVPVE%26feature%3Dshare

InMind 2 VR Google Cardboard 3D SBS https://www.youtube.com/attribution_link?a=VP_6uKvnLps&u=%2Fwatch%3Fv%3DjsY0yM_PRqE%26feature%3Dshare
Microsoft HoloLens: Partner Spotlight with Case Western Reserve University https://www.youtube.com/attribution_link?a=2S-8BO49JrA&u=%2Fwatch%3Fv%3DSKpKlh1-en0%26feature%3Dshare
The Human Body In Virtual Reality https://www.youtube.com/attribution_link?a=hALL1_wOWpA&u=%2Fwatch%3Fv%3DtpbCu-FtVUE%26feature%3Dshare
Take A Tour Of The Human Body With The Help Of Virtual Reality https://www.youtube.com/attribution_link?a=MhkG8w93bYI&u=%2Fwatch%3Fv%3DDbS0IwluIeI%26feature%3Dshare
Journey through the human body in 3D Flight & Motion simulation https://www.youtube.com/attribution_link?a=6-x9k8WG5Ig&u=%2Fwatch%3Fv%3DeXQgPCsd83c%26feature%3Dshare
Awesome POV Virtual Reality Anatomy Learning https://www.youtube.com/attribution_link?a=pTflcAQhI7k&u=%2Fwatch%3Fv%3DeCPKmIAjcfQ%26feature%3Dshare
Virtual Reality of Human Anatomy https://www.youtube.com/attribution_link?a=0j2YVhDo6Kg&u=%2Fwatch%3Fv%3DRgGJqqYAS54%26feature%3Dshare
What Happens Inside Your Body? - VR 360° https://www.youtube.com/attribution_link?a=Elro5JuQd7M&u=%2Fwatch%3Fv%3D-FyN5_-njAU%26feature%3Dshare
The Body VR: Journey Inside a Cell http://thebodyvr.com/journey-inside-a-cell/
Educational portal of pdp101 http://pdb101.rcsb.org/ http://pdb101.rcsb.org/motm/motm-about
InterPro: protein sequence analysis & classification http://www.ebi.ac.uk/interpro/potm/archive.html
MOLECULE VIEWER Revolutionizing 3D molecular visualization for scientists and learners https://molviewer.com/
What it means to do a structural biology lecture in virtual reality (feat. Molecule Viewer), Merry Wang October 13, 2016 https://www.autodeskresearch.com/blog/what-it-means-do-structural-biology-lecture-virtual-reality-feat-molecule-viewer
ALLEN INSTITUTE FOR CELL SCIENCE Allen Cell Explorer http://www.allencell.org/
Allen Institute for Brain Science announces first comprehensive gene map of the human brain The Allen Human Brain Atlas reveals more than 90 percent similarity among humans and details genes at work throughout the brain to advance scientific research and medical outcomes, April 12, 2011 http://www.alleninstitute.org/what-we-do/brain-science/news-press/press-releases/allen-institute-brain-science-announces-first-comprehensive-gene-map-human-brain
The Virtual Mouse Brain: A Computational Neuroinformatics Platform To Study Whole Mouse Brain Dynamics- View ORCID Profile Francesca Melozzi, Marmaduke Woodman, Viktor Jirsa, Christophe Bernard,doi: https://doi.org/10.1101/123406 http://biorxiv.org/content/early/2017/04/03/123406

Discussion

As previously mentioned under the methods section the main textbook used for the introductory two courses in Biology I and II is the latest edition (15th) of *Inquiry into Life* by Dr. Sylvia Mader plus the same edition Laboratory Manual (Lab Manual). This textbook now available in electronic form as well, is considered one of the cornerstones of introductory biology education. *Inquiry into Life* was founded on the belief that teaching science from a human perspective, coupled with human applications, would make the material more relevant to the student. As a book it maintains a relevancy-based style and helps enhance the

learning process by integrating more human-related applications and it also deploys new pedagogical elements, including multimedia assets, to increase student interaction with the text. It nevertheless provides students with a firm foundation in core principles of biology helping them achieve a background to keep up with the many future discoveries. As instructors, we focus on the concept of inquiry and our inherent desire to learn and we have found that by using such high quality textbooks and lab manuals it is not only easier to make these findings available to our students, but help us to enlighten students as to why these discoveries are important to their lives and society. So we felt the need to integrate a tested, traditional learning system with modern digital and pedagogical approaches designed to stimulate and engage today's student. We are now quite mature to start applying best practices from the lessons learnt. We should be ready to design a flexible learning content based on evidence and experimentation. We should be ready to integrate theory and practice and to start sharing more openly our knowledge and create open resources. As for the educational process itself, we should be in the position to move toward more active learning which leads to a new overall conceptual model that includes evidence and problem based learning, continuous improvement, collaborative learning, personalized learning, taking care of special needs and also developing critical skills see Picture 2.

In 2015, the U.S. Department of Education, in collaboration with American Institutes for Research (AIR), convened a series of 1.5-day workshops that brought together invited STEM experts and thought leaders in teaching and learning to share their ideas and recommendations for an innovative future of STEM education. Nearly 30 individuals contributed to the project which addresses six interconnected components of STEM 2026, and the challenges and opportunities for innovation related to converting these components into widespread practice: The contributors to STEM 2026 acknowledge that developing and achieving a forward-thinking approach to STEM education is a complex and evolving task and that it will require a lot of synergies in order to ensure the following:

Engaged and networked communities of practice

Accessible learning activities that invite intentional play and risk.

Educational experiences that include interdisciplinary approaches to solving "grand challenges."

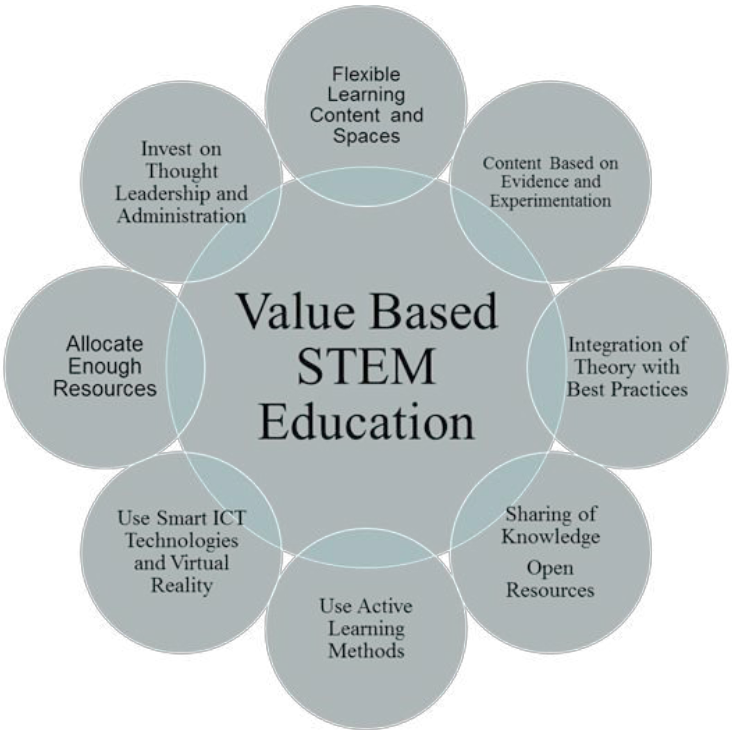
Flexible and inclusive learning spaces.

Innovative and accessible measures of learning.

Societal and cultural images and environments that promote diversity and opportunity in STEM.

(U.S. Department of Education, Office of Innovation and Improvement. 2016)

PICTURE 2. PROPOSED FRAMEWORK OF VALUE BASED STEM EDUCATION BY USING ACTIVE LEARNING STRATEGIES AND SMART ICTS IN HIGHER EDUCATION



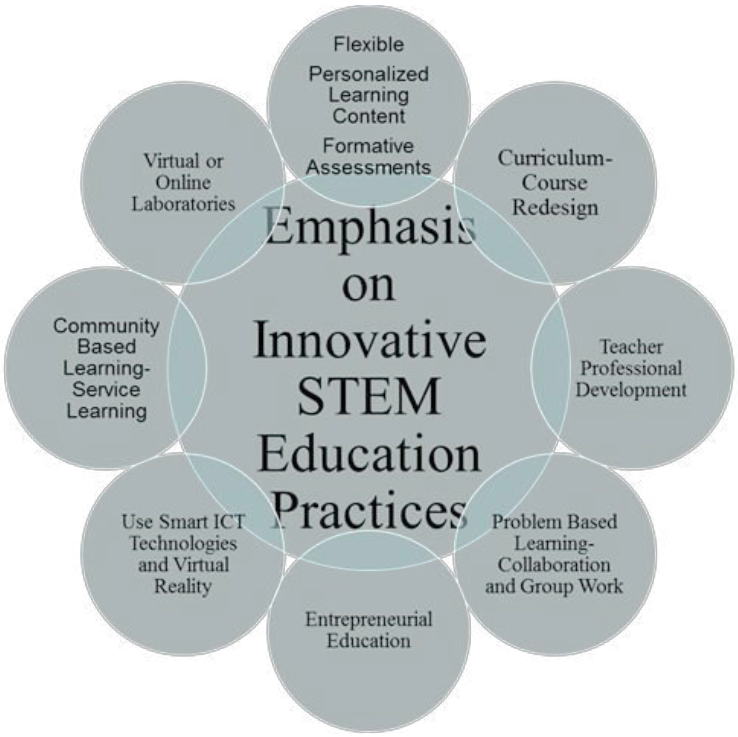
Source own

There is high need that the evaluation should be holistic and administrators should look carefully into these new areas of innovative development by properly managing resources and objectives so that through interdisciplinary integration new curricula and programs are put in place for the benefit of all stakeholders.

Of course this effort can only materialize through proper exploitation of the emerging new technologies such as cloud computing, virtual reality, games, virtual or online laboratories, simulations but also proper big data analysis. We should expect new industry academia collaborations through startups, competitions and awards and community service based learning. This type of technology enhanced learning will strengthen if novel information is integrated with communication technologies and people have indeed access to free and open source tools. This is not the situation at the present time as the providers of virtual reality systems maintain them at high prices but we hope that eventually all people will be able to use the new technologies, see picture 3. This proposed framework is in alignment with a number of efforts and studies we came across in our literature review such as the Learning Beyond the Classroom (LBC) voluntary, certificate program of Purdue University aimed at encouraging College of Science students to engage in experiential learning. In it, students take part in multiple high-impact activities such as Service, Citizenship, and Leadership category where students utilize structured reflection on their skills, interests and futures and draw conclusions about the effect of their contribute to the community through interactive service (Starr, Minchella 2016). Furthermore, in a review short article on “Rethinking traditional teaching methods to improve learning and retention” by Kenneth Reid promoting a Practical guide “Teaching and

Learning STEM: A Practical Guide by Dr. Richard Felder and Dr. Rebecca Brent" one can see good reasons for it to serve as a practical guidance for the college instructor on how to translate the findings of STEM research into effective classroom practice. The book can be used as a reference work as it presents proven teaching methods, built upon a foundation of research and experience, and prepare the instructor to implement those methods. Shortly, Part I covers the designing of courses as the blend of research- and experience-based evidence Part II: looks at elements of effective instruction on teaching courses and how to manage our class. Part III: discusses ideas for facilitating skill development in key areas (Reid 2016). In addition, the report "Sparking Innovation in STEM Education with Technology and Collaboration: A Case Study of the HP Catalyst Initiative" highlights innovative technology-supported pedagogic models in (STEM) education, promoting educational innovation through collaboration and how technology-supported learning can help to move beyond content delivery to development of a broad mix of skills explores and outlines lessons for policy-makers and other stakeholders (Kärkkäinen, Vincent-Lancrin 2013).

PICTURE 3. PROPOSED FRAMEWORK ON THE EMPHASIS TO BE GIVEN ON INNOVATIVE STEM EDUCATION PRACTICES



Source own

Conclusion

At the present time, we face a lot of societal challenges where the STEM course outcomes are not well integrated to society and in fact we are far from a green economy and face a lot of environmental problems that lead to social exclusion from innovative development and prosperity. The community, industry and academia partnerships should be strengthened having in mind continuous improvement for all stakeholders

so as to maintain balance between all aspects related to the needs of the individual, the society and the economy. This new knowledge should eventually lead to social innovation which will be more inclusive and will create a brighter and sustainable future for all.

The effort put into this paper, we hope, will positively contribute toward the design of strategies for succesful course design not only for introductory biology courses but for STEM courses in general which will enhance the learning process and ensure that the course goals and the important learning tasks are well covered and met.

References

Barrows, H.S., Tambling, R., 1980. "Problem-Based Learning: An Approach to Medical Education, Springer." New York.

Dewey, J., 1997. "Experience and Education." Macmillan.

Freire, P., 1996. "Pedagogy of the Oppressed." New York: Penguin Edition.

Kärkkäinen, K. and S. Vincent-Lancrin 2013. "Sparking Innovation in STEM Education with Technology and Collaboration: A Case Study of the HP Catalyst Initiative." OECD Education Working Papers, No. 91, OECD Publishing.

Lytras, M., Alhalabi, W., Torres Ruiz, M. J., Papadopoulou, P., Marouli, C., 2016. "Emerging Technologies for Engineering Education:Flexibility, Consistent exploration, Realism, Integration, and Sustainable Development for Active Learning." International Journal of Engineering Education 32, pp. 1560–1565.

Lytras, M., Marouli, C., Papadopoulou, P., 2016. "Best practices in STEM education: Using active learning and novel teaching methodologies for education for innovation and sustainability future of education." 6th International Conference: Future of Education, Florence Italy, June 29 – July 2., http://conference.pixel-online.net/FOE/prevedition.php?id_edition=22&mat=CPR, accessed on 16th May 2017.

Lytras, M.D., Mathkour, H. I., Abdalla, H. I., Al-Halabi, W., Yáñez- Márquez, C., Siqueira, S. W. M., 2015. "An emerging - Social and emerging computing enabled philosophical paradigm for collaborative learning systems: Toward high effective next generation learning systems for the knowledge society." Computers in Human Behavior Vol. 51, pp. 557–561.

Lytras, M.D., Zhuhadar, L., Zhang, J. X., Kurilovas, E., 2014. "Advances of Scientific Research on Technology Enhanced Learning in Social Networks and Mobile Contexts: Towards High Effective Educational Platforms for Next Generation Education." J. UCS 20 (10), pp. 1402–1406.

Lytras M.D., Mathkour, H., Abdalla, H. I., Yáñez- Márquez, C., Ordóñez de Pablos, P., 2014. "The Social Media in Academia and Education Research R-evolutions and a Paradox: Advanced Next Generation Social Learning Innovation." Journal of Universal Computer Science 20 (15), pp. 1987–1994.

Marouli, C., Misseyanni, A., Papadopoulou, P., Lytras, M., 2016. "ICT in Education for Sustainability: Contributions and Challenges." In International Conference The Future of Education (6th ed.), Florence: Libreriauniversitaria.

Misseyanni, A., M.T. Gastardo, M.T. 2017. "Active Learning in the Sciences: The Case of Undergraduate Environmental Science Class." Academic Journal of Science 7 (2) , pp. 207–216.

Misseyanni, A., Marouli, C., Papadopoulou, P., Lytras, M., Gastardo, M.T., 2016. "Stories of Active Learning in STEM: Lessons for STEM Education." In International Conference The Future of Education (6th ed.)., Florence: Libreriauniversitaria. 2016.

Misseyanni, A., Daniela, L., Lytras, M., Papadopoulou, P., Marouli, C., 2017. "Analyzing Active Learning Strategies in Greece and Latvia: Lessons Learnt and the Way Ahead." INTED2017 Proceedings.

Montessori, M., 1989. "Education for a New World." Clio Press.

Papadopoulou, P., Lytras, M., Marouli, C., 2016. "Capstone projects in STEM education: Novel teaching approaches, mentoring and knowledge management for empowering students." 8th International Conference on Education and New Learning Technologies, Barcelona, Spain, 4–6 July. EDULEARN16 Proceedings, 2016, https://library.iated.org/view/PAPADOPOULOU2016CAP, accessed on 16th May 2017-

Papadopoulou, P. Marouli, C. Misseyanni, A., Lytras, M., 2016. "Teaching in Higher Education: Active Learning, and new Teaching Methodologies." IJKSR 7 (4)

Reid, K., 2016. "Teaching and Learning STEM: A Practical Guide by Dr. Richard Felder and Dr. Rebecca Bren." Journal of STEM Education 17 (1), pp. 58-60.

Santora, K., Mason, E., 2013. "A Model for Progressive Mentoring in Science and Engineering Education and Research", Innovative Higher Education 38 (5). pp. 427–440.

Starr, L., Minchella, D., 2016. "Learning Beyond the Science Classroom: A Roadmap to Success, Journal of STEM Education 17 (1), pp. 52-57.

United Nations, 1977. "Tbilisi Declaration." http://www.gdrc.org/uem/ee/tbilisi.html, accessed on May 14.

United Nations, 2015. "Sustainable Development Goals: 17 Goals to Transform Our World." http://www.un.org/sustainabledevelopment/sustainable-development-goals, accessed on 14th May.

U.S. Department of Education, Office of Innovation and Improvement, 2016. “STEM 2026: A Vision for Innovation in STEM Education. Washington, DC: Author.” This report is available on the Department’s website at https://innovation.ed.gov/what-we-do/stem/, accessed on 14th May

Velegol, S., Zappe, S., Mahoney, E. 2015. “The Evolution of a Flipped Classroom: Evidence-Based Recommendations.” Advances in Engineering Education 4 (3), pp. 1–37.

VIDEO TUTORIALS FOR STUDENTS OF THE MASTER'S PROGRAM

RADKA HAMŘÍKOVÁ, DAGMAR DLOUHÁ

Department of Mathematics and Descriptive Geometry
VSB - TU Ostrava, Czech Republic

e-mail of corresponding author: radka.hamrikova@vsb.cz

Key words: video tutorial, youtube.com, consultation.

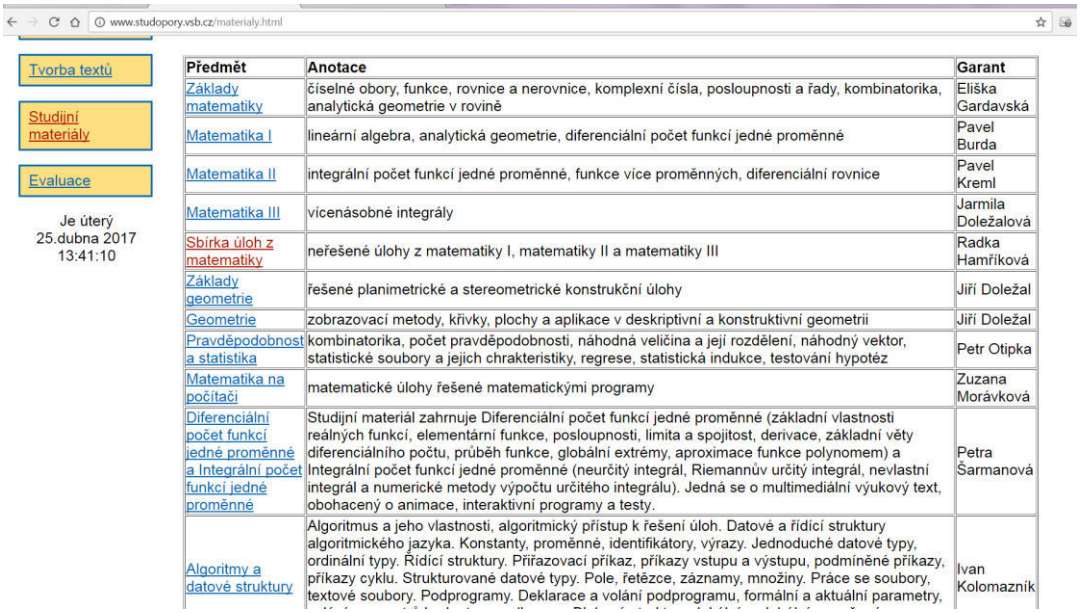
Abstract: Students of following master's programs, which are studying in presence or combine form, come to the VSB - Technical University from various specializations and the level of their knowledge of mathematics is therefore diametrically different. An integral part of their future studies are also subjects such as Mathematics or Selected chapters from mathematics in Engineering subject. Both courses require a good knowledge of a Bachelor's Mathematic I. and II. Not every student has the required knowledge to follow these courses. Due to the combined studies are students introduced to the learning materials through personal consultation. Students are often going to school or study at the detached workplace in Most. As we want to be able to provide consultations according to their needs, we record video tutorials for our students. They can watch the video prepared for the course, send us an email with questions or examples of their progress. If needed, we can also shoot video responses for them. These videos are placed on youtube.com and can be deleted at the end of the semester. In the article we will show how we record commented videos of exercise being solved, which is then used by students for self-study. On model situation we will show following video consultation to this exercise. We offer our students an original way of consulting.

Introduction

The department of mathematic and descriptive geometry ensures teaching on five faculties VSB-TU Ostrava in Bachelors and following Masters programs of presentation and combine studies. In this article, we will be targeting 312 students of following Masters studies of Faculty of Mining and Geology, for which we are running the subjects of Engineering mathematic and Chosen chapters of Mathematic. Teaching is being held in Ostrava and in detached workplace in Most.

The combined form of study is divided into 18 hours of classes, which are running in two or three blocks. We have students with different levels of mathematic attending these classes, as they absolved the Bachelor's maths in different schools, where the level was lower than on VSB-TU Ostrava. Students can use the scripts or the web address called "studijni opory" – learning support (www.studopory.vsb.cz). These pages are not only for teaching maths. They were created in 2006–2008 in the Learning Support project with preponderant distant elements for subjects of the theoretical basis of the study, also video materials on the web of the department and the collection of unsolved exercises for training.

PICTURE 1. STUDYING MATERIALS



www.studopory.vsb.cz/materialy.html

Tvorba textů

Studijní materiály

Evaluace

Je úterý
25.dubna 2017
13:41:10

Předmět	Anotace	Garant
Základy matematiky	číselné obory, funkce, rovnice a nerovnice, komplexní čísla, posloupnosti a řady, kombinatorika, analytická geometrie v rovině	Eliška Gardavská
Matematika I	lineární algebra, analytická geometrie, diferenciální počet funkcí jedné proměnné	Pavel Burda
Matematika II	integrální počet funkcí jedné proměnné, funkce více proměnných, diferenciální rovnice	Pavel Kreml
Matematika III	vícenásobné integrály	Jarmila Doležalová
Sbírka úloh z matematiky	neřešené úlohy z matematiky I, matematiky II a matematiky III	Radka Hamříková
Základy geometrie	řešené planimetrické a stereometrické konstrukční úlohy	Jiří Doležal
Geometrie	zobrazovací metody, křivky, plochy a aplikace v deskriptivní a konstruktivní geometrii	Jiří Doležal
Pravděpodobnost a statistika	kombinatorika, počet pravděpodobnosti, náhodná veličina a její rozdělení, náhodný vektor, statistické soubory a jejich chrakteristiky, regrese, statistická indukce, testování hypotéz	Petr Otipka
Matematika na počítači	matematické úlohy řešené matematickými programy	Zuzana Morávková
Diferenciální počet funkcí jedné proměnné a Integrální počet funkcí jedné proměnné	Studijní materiál zahrnuje Diferenciální počet funkcí jedné proměnné (základní vlastnosti reálných funkcí, elementární funkce, posloupnosti, limita a spojitost, derivace, základní věty diferenciálního počtu, průběh funkce, globální extrémy, aproximace funkce polynomem) a Integrální počet funkcí jedné proměnné (neurčitý integrál, Riemannův určitý integrál, nevlastní integrál a numerické metody výpočtu určitého integrálu). Jedná se o multimediální výukový text, obohacený o animace, interaktivní programy a testy.	Petra Šarmanová
Algoritmy a datové struktury	Algoritmus a jeho vlastnosti, algoritmický přístup k řešení úloh. Datové a řídící struktury algoritmického jazyka. Konstanty, proměnné, identifikátory, výrazy. Jednoduché datové typy, ordinální typy. Řídící struktury. Přiřazovací příkaz, příkazy vstupu a výstupu, podmíněné příkazy, příkazy cyklu. Strukturované datové typy. Pole, řetězce, záznamy, množiny. Práce se soubory, textové soubory. Podprogramy. Deklarace a volání podprogramu, formální a aktuální parametry,	Ivan Kolomazník

Source: www.studopory.vsb.cz

If the student approaches a difficulty, he has the possibility of personal consultation with his tutor. If the personal meeting cannot be arranged, we can consult the student over the phone or Skype. The students can also visit MSC.

The main characteristic of MSC is that we lead consultations in an informal study atmosphere, out of the class. Students come to support center with problems from the lectures, regular lessons or their individual projects. Our tutors don't solve the problem instead of the student. On the contrary, they guide him or her and help with an advice. If needed, they lead students by questions, in such a way that the student gets to the root of his/her problem and finds a solution. Our goal is that students solve their problems by themselves. We believe that with active independent approach, students will learn much more, than if we just say them how their problem should be solved. We advice them how to study and learn effectively and how to independently approach new topics. Without such approach the overcoming of gaps in knowledge from four years of study at secondary school while also studying the first year at technical university is almost impossible. Our approach can be easily described by famous quotation of Benjamin Franklin: "Tell me and I forget. Teach me and I may remember. Involve me and I learn" (Hamříková, Kotůlek, Žídek 2017).

The personal consultation is unfortunately almost impossible for the majority of the students, as they live in distant places and visiting the school is complicated for them. Therefore we tried to replace personal meetings with video-consultations (Hamříková, Dlouhá 2017).

Video-consultation

As a base for video-consultations we used the collection of unsolved exercises for training. From every thematic field, we've chosen one exercise and recorded a video tutorial of solving the problem with the spoken comment. Our students are already used to this form of self-study support, as there is already a bank of exercises from the Bachelors Mathematic I, II and descriptive geometry.

For video recording we use interactive board, program for operating the board, which is called the Device manager, then the Camasia studio for cut and sounding and a graphic calculator GeoGebra for functions and 3D mathematic, which is free to download.

This form of study is very popular among our students. We've created a questionary and it was answered by half of our students approx. From their answers, it was clear, that our videos are very important part of their preparation for an exam. They appreciate their accessibility on the internet and our willingness to record another videos.

From our experiences, we already know, that when solving a certain exercise, students play the commented video of a similar problem in the first place and they try to understand each step of the solution. We record our videos such as the exercise is not only solved correctly but also economically. Too long explaining of each step could discourage the more talented students and would cut down the independent activity of another ones. If any student shall need further and closer explaining of any steps, he can send us a question. For communication with students, we use the school e-mail or comment underneath the videos on YouTube.

At first, we planned to put those materials on school web, where they also were for two semesters and students were using them actively. After we started to do video-consultations we realized that the space on our web in highly insufficient, so after considering another options we decided to move our materials on YouTube. These days, we are gradually moving videos to youtube and also editing videos as required by students. We don't have many views so far, but we believe that students will watch our materials here too, because the rules of video-consultations are explained in the presentation. All students, which have the certain subject written in their study plan have received an email with a new link to all materials.

Model situation

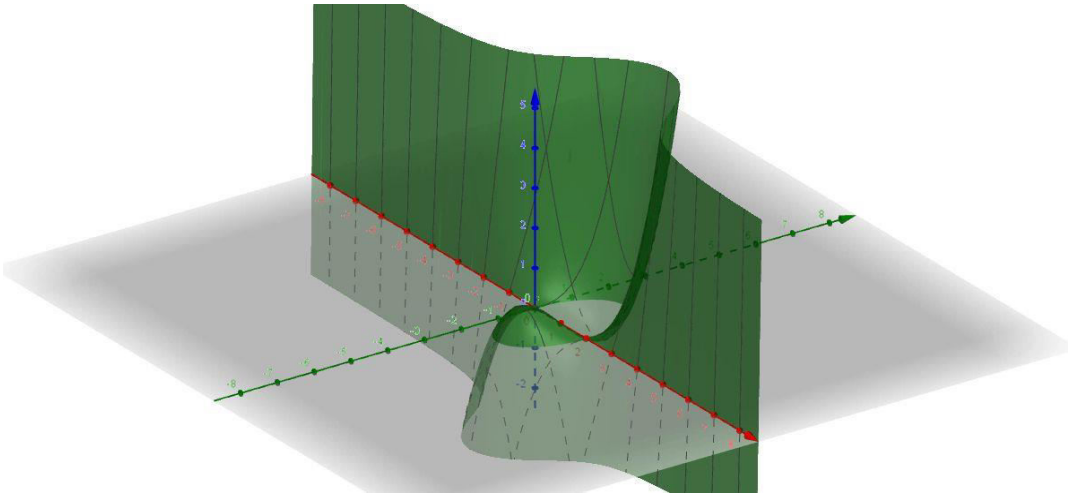
Now we will be showing how the usual communication between students and tutors looks like.

One of the situation is extremes of a function of two variables (local, dependent and global). In the time allocation of 1 hour are students introduced to the theory, they will have the example of exercise calculated and will receive the link to the web address with materials to self-study. Unfortunately, the majority of students is only re-writing the information from the board and are thinking about the meaning back at home, where there is no one to explain what they didn't understand. Many students also can't attend all classes due to high workloads.

Therefore they often find difficulties when solving the exercises from the collection of unsolved exercises as a preparation for the exam, and they are unable to solve them on their own. The collection has 17 themes.

We recorded a video of one example of the theme and the students are to solve another exercises by themselves.

PICTURE 2. VIDEO



$$f(x,y) = x^2\,y - 2\,x\,y + \frac{y^3}{3}$$

$$f'_x = 2\,x\,y - 2\,y \qquad 2\,x\,y - 2\,y = 0$$
$$f'_y = x^2 + y^2 - 2\,x \qquad x^2 + y^2 - 2\,x = 0$$

$$2y(x-1) = 0$$
$$y = 0 \quad x = 1$$

$$x^2 - 2x = 0 \qquad y^2 - 1 = 0$$
$$x = 0 \quad x = 2 \qquad y = \pm 1$$

Stacionární body

$$A_1 = [0,0]$$
$$A_2 = [2,0]$$
$$A_3 = [1,1]$$
$$A_4 = [1,-1]$$

$$f''_{xx} = 2\,y$$
$$f''_{xy} = 2\,x - 2$$
$$f''_{yy} = 2\,y$$

$$D_2 = \begin{vmatrix} 2\,y & 2\,x-2 \\ 2\,x-2 & 2\,y \end{vmatrix}$$

$$A_1 = [0,0] \ldots\ldots\ldots D_2 = \begin{vmatrix} 0 & -2 \\ -2 & 0 \end{vmatrix} = -4 \quad \textit{není extrém}$$

$$A_2 = [2,0] \ldots\ldots\ldots D_2 = \begin{vmatrix} 0 & 2 \\ 2 & 0 \end{vmatrix} = -4 \quad \textit{není extrém}$$

$$A_3 = [1,1] \ldots\ldots\ldots D_2 = \begin{vmatrix} 2 & 0 \\ 0 & 2 \end{vmatrix} = 4 \quad \textit{je extrém, } D_1 = 2 \textit{ Lok. min.}$$

$$A_4 = [1,-1] \ldots\ldots\ldots D_2 = \begin{vmatrix} -2 & 0 \\ 0 & -2 \end{vmatrix} = 4 \quad \textit{je extrém, } D_1 = -2 \textit{ Lok. max.}$$

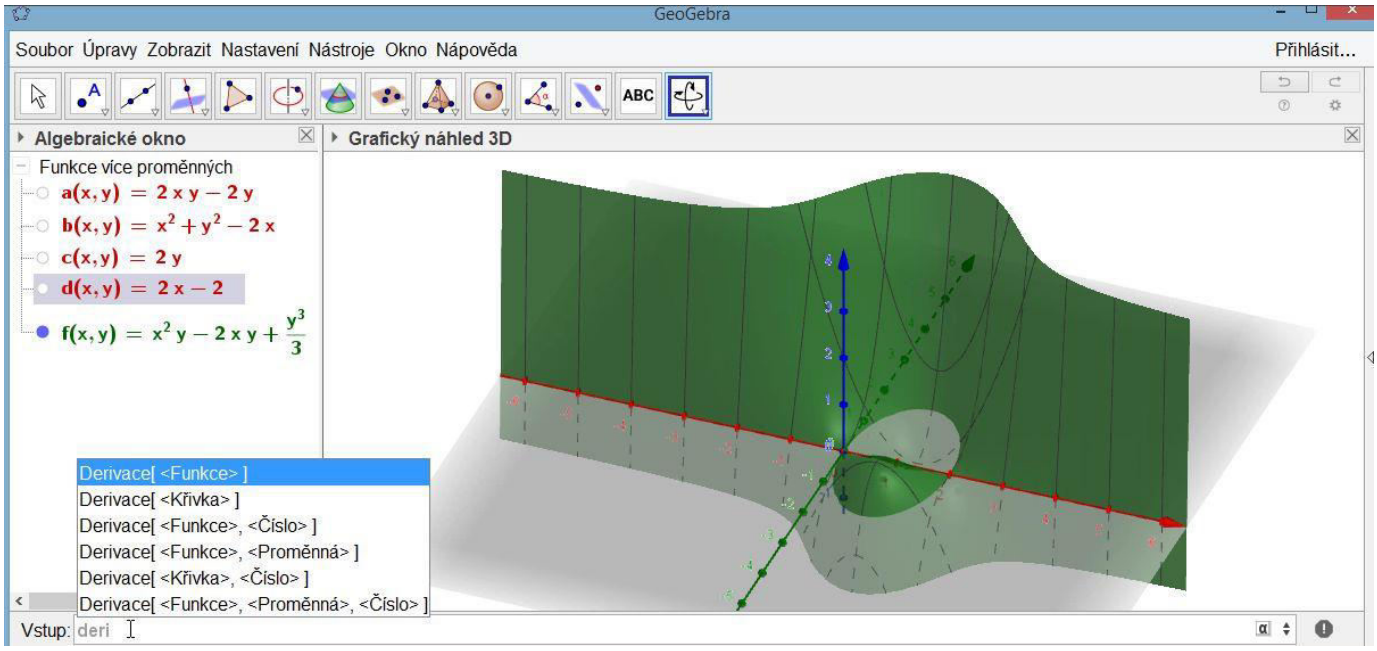
Source: Own

Questions of students

1. Q: You have a good graph, I can't make it in another exercise. Can you help me?

   A: We will record instructory video of how to work with GeoGebra.

PICTURE 3. VIDEO



Source: Own

2. Q: How did you find four stationary points?

A: The video will show you how to solve a combination of two functions of two variables.

PICTURE 4. VIDEO

$$f(x,y) = x^2\,y - 2\,x\,y + \frac{y^3}{3}$$

$$f'_x = 2\,x\,y - 2\,y \qquad 2\,x\,y - 2\,y = 0$$
$$f'_y = x^2 + y^2 - 2\,x \qquad x^2 + y^2 - 2\,x = 0$$

$$2y(x-1) = 0$$
$$y = 0 \quad x = 1$$

$y = 0$ *dosadíme do druhé rovnice*

$$x^2 - 2x = 0$$
$$x(x-2) = 0$$
$$x = 0 \quad x = 2$$

$x = 1$ *dosadíme do druhé rovnice*

$$1 + y^2 - 2 = 0$$
$$y^2 - 1 = 0$$
$$(y-1)(y+1) = 0$$
$$y = \pm 1$$

$$A_1 = [0,0]$$
$$A_2 = [2,0]$$
$$A_3 = [1,1]$$
$$A_4 = [1,-1]$$

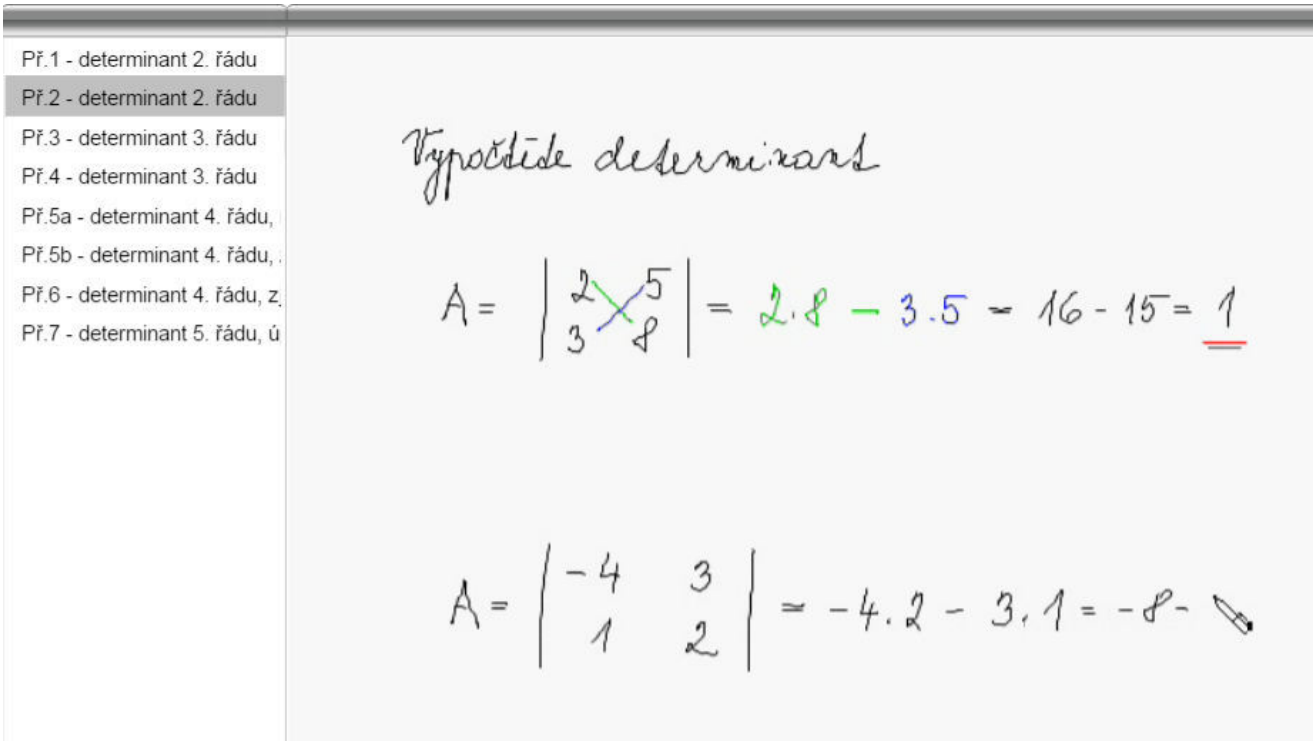
Source: Own

3. Q: How is determinant being calculated?

A: Supplementary video with picture of the video. (Picture 5)

http://www.studopory.vsb.cz/studijnimaterialy/Sbirka_uloh/video/deter1/index.html

PICTURE 5. DETERMINANTS



Source: www.studopory.vsb.cz

Conclusion

In these days we have recorded seventeen exercises. To ten of them have students asked further questions. We managed to answer about half of these questions using current materials, and we recorded additional videos to explain the rest of them. To these videos we received only a few short questions, which we managed to answer over email. There was no need to record another videos.

This collaboration with students can't obviously replace personal consultation, but regarding the limited time schedule of our students, it seems to be beneficial for both sides. It is also a way of how to keeps students in intensive contact between learning blocks and exam. This can also help to eliminate the deficiencies of a large number of students at once. Those students which are using video-consultations are usually well prepared for the exam and they do complete it without problems.

References

Hamříková, R., Kotůlek, J., Žídek, A., 2017. "Math Support Centre at Technical University of Ostrava". Rybnik.

Hamříková, R., Dlouhá, D., 2017. "Youtube in teaching geometry". Rybnik.

Hamříková, R. "Sbírka úloh z matematiky". Studopory [online]. Ostrava: VŠB - TU Ostrava, 2008. http://www.studopory.vsb.cz/studijnimaterialy/Sbirka_uloh/video/obsah.html, , accessed on 14th May.

COLLABORATION OF PARENTS AND INSTITUTIONS IN SUPPORT OF PROPER DEVELOPMENT OF PRESCHOOLERS

PERO SPASOJEVIC

Teachers training faculty
University of East Sarajevo, Bosnia & Herzegovina

MIRJANA SAMARDZIC

Faculty of Philosophy
University of East Sarajevo, Bosnia & Herzegovina

MARICA TRAVAR

Teachers training faculty
University of East Sarajevo, Bosnia & Herzegovina

e-mail of corresponding author: maricac86@gmail.com

Key words: Colaboration between parents and preschool educators, Parental openness for cooperation.

Abstract: Unlike of what exists in developed countries, in Bosnia & Herzegovina, on top of the general distrust in the power of early learning, there exist quite widespread doubts and distrust in institutions, like the one - Can the institution act in a beneficial way to what it is missing in the family. It is pretty obvious that parents retreat when the child starts kindergarten, believing they "no longer have anything to do with their education". In terms of the quality of cooperation between preschool educators and parents in the kindergarten it is inevitably the standpoint that it is practically nothing possible to achieve without the involvement of parents, whereby in particular indicate to their willingness to cooperate. This paper is telling about the research conducted in order to gain insight into the openness of the parents to cooperate with preschool educators, in May 2012, a survey was conducted on a sample of 360 parents whose children were in kindergartens located in Sarajevo-Romanija region of Bosnia & Herzegovina during the researching. Data collected by the scaler were analyzed using the factor analysis, which separated three factors that indicate to the openness of the parents to cooperate with preschool educators, as well as their assessment of the contribution and cooperation of the realization of educational work in kindergarten. There are three featured factors that indicate the openness of parents to cooperate with teachers: learning from preschool educators, working together with preschool educators and joint training with preschool educators. Featured factors in this study indicate the importance and necessity of teachers and parents, indicating that this area regardless of the number of publications and papers are still insufficiently explored.

Introduction

Collaboration between preschool educators and parents has been an important issue ever since the institutional education of preschool children in kindergartens was organized. The cooperation, however, has not always been of the same intensity and quality, and not all parents have always been sufficiently involved. In the current circumstances, the cooperation between preschool educators and parents has evolved into a partnership regulated by law, and the competencies of the educators necessary for cooperation with parents has been also defined (Самарџић, Травар 2016).

The cooperation between preschool educators and parents is an important precondition for the optimal children development. As a matter of fact, an educator's professional role and a parent's life role are much alike. With kindergarten, parents and educators become associates performing the same mission, and they also share responsibility for the effects of child's upbringing, education, learning and overall development. Although parents and educators are associates working on the very same project, they rarely act together. This is why educators do not directly witness the parenting process within a family, nor does a parent attend the educating process in the kindergarten. The only direct witness of both parenting and educating

roles is a child. Thus, it is necessary to estimate the influence of the cooperation between preschool educators and parents based on the education and learning progress of a child in the kindergarten.

Bearing in mind that society has always set the goals and missions of education and that family is one of the factors that take part in the realization of education, it becomes obvious that providing support and assistance to parents in the educational process is one of the most vital needs in every society. The cooperation between preschool educators and parents implies „... providing every parent with the knowledge necessary to influence the child ..." (Продановић 2008, 9). Thereto it is preferable that this systematic influence on children's pedagogical and psychological education gradually evolves into self-education. Because every child has specific possibilities and capabilities, self-education is necessary for every parent today and represents one of the steps towards achieving an open education.

Many different terms are used in literature to define the cooperation between preschool educators and parents of kindergarten children. The term „the cooperation between preschool educators and parents" is defined differently according to specific pedagogic tradition. So, in Anglo-Saxon speaking area, the cooperation between preschool educators and parents implies their involvement in the educational process in the kindergarten (Jumiaan et. al. 2012; Turunen and Maatta 2012). Contrary to such definition, the usual term in German pedagogical theory is *parent participation* (Pugh 1987). Apart from these, other terminology is used in pedagogical theory and practice, such as *participation of parents* (Karkkainen 2012), *parents as educators* (Ludicke and Kortman 2012), *parent involvement* (Salazar 2012), *working with parents* (Sudduth 2011), or *parents as partners* (Harris 2012).

Modern kindergartens strive to abolish traditional consumerist relationships between family as service user and kindergarten as service provider. It is discernible that kindergartens aspire to their own deinstitutionalization. This can be achieved, as Snežana Marinković observes, „by allowing the parents to, apart from their home, perform their parenting role in broader social surroundings as well, namely, in the kindergarten" (Маринковић 1995, 8). Fulfilling parenting role in the institutional surroundings also contributes to better educator-parent relationship and thus significantly to overall realization of educational activities in kindergartens; it further contributes to achieving an open educational process where parents learn from the educators and vice versa.

Methods

Research problem. The cooperation between educators and parents has been a problem issue in both theory and practice of various scientific fields. Many philosophers, psychologists, sociologists, pedagogues, andragogues and other scientific workers have dealt with this problem. However, the science, or more specifically the scientific discipline that has been involved with the problem of cooperation between educators and parents for the longest period of time and the most thoroughly, is pedagogy, that is, a

preschool pedagogy. Bearing in mind the significance of the cooperation between preschool educators and parents in implementing educational process in preschool institutions, it can be said that this represents one of the central and global problems of preschool pedagogy in general.

Continual cooperation between preschool educators and parents contributes to regular monitoring of child activities in the kindergarten, or, as Mile Ilić claims, „to monitoring their development, their improvement; to finding the causes of their difficulties, to providing them with necessary help, indicating their mistakes and encouraging the normal development of their potentials" (Илић 2010, 392). In other words, permanent cooperation between preschool educators and parents gives one the opportunity to know what the child does and how the child does it at all times, and also what kind of help, if any, is needed in the process. What place do the educators, parents and children take in the process? To answer this and other relevant questions, the cooperation between preschool educators and parents should be stronger, more modern and more effective.

Research subject. Broadly speaking, the subject of this research is cooperation between educators and parents, and more specifically, the research subject is a contribution that the collaboration with educators has in the educational process in the kindergarten, as well as suggesting measures for its improvement.

Research aim and objectives. According to research subject, the aim of this research is to identify the parents' estimate about the most common factors indicating the contribution that the collaboration with educators has in the educational process in the kindergarten.

Research assignments. Considering the problem, subject and aim of the research, a research assignment is to identify the most common factors indicating the contribution that collaboration with educators has in the educational process in the kindergarten.

Research hypotheses. General hypothesis is that most parents believe that their cooperation with educators contributes to realization of better educational process in the kindergarten. Specific hypothesis is that the research will help identify the factors indicating the most common parents' estimate on the contribution that the collaboration with educators has in the educational process in the kindergarten.

Research variables. Independent variable is a group of parents included in the research, and dependant variable is their estimate on the contribution that the collaboration with educators has in the educational process in the kindergarten.

Research procedures, methods, techniques, and instruments. Historical and transversal procedure was used, as well as methods of theoretical analysis, synthesis and description. Research technique was scaling and it was conducted by using parents' estimate scale on the contribution with educators in realizing educational process in the kindergarten (SCALER 1); the scale used 5-point Likert scale; it consists of 20 claims, each followed by intensity scale: a) I agree completely, b) Mostly I agree, c) I am not sure, d) I

mostly disagree and e) I disagree completely. The scale was originally made for the purposes of this research and its metrical characteristics tested adequately.

Research population and research sample. The population comprises of all parents whose children attended kindergartens during the months of April and May in 2012 in Sarajevo-Romanija region in BH. The research sample covered 360 parents. The sample was random and representative with regard to population.

Research organization and its course. The research was conducted during the months of April and May in 2012.

Data processing. The data were processed using factor analysis with Varimax rotation. Kaiser-Meyer-Olkin (KMO) Test and Bartlett's test of sphericity were used.

Results

– Identification of factors according to parents' estimate on the significance that the cooperation with educators has in the educational process in the kindergarten.

Correlation matrix, not included in the paper due to its length, showed that 286 of 400 coefficients in total has value of 0,30 or more. The data indicate matrix factorability and adequacy of factor analysis.

According to the data showed in Table 1, it is evident that KMO test indicates solid value (KMO=0,736). Bartlett's test of sphericity reached statistic significance on the level of $p<0,001$ ($p=0,000$) and reveals that correlation matrix of manifest variables significantly differs from the identity matrix (in matters of the statistics). Therefore, scale statements (manifest variables) are well suited metrically, that is their correlation matrix is suitable for factorization.

TABLE 1. KMO AND BARTLETT'S TEST OF SPHERICITY

KMO	,736	
Bartlett's Test of sphericity	χ^2	3408,000
	df	190
	P	,000

Kaiser-Meyer-Olkin test and the method of main components with Varimax rotation indicated to three main components with characteristic root bigger than one. According to the data showed in Table 2 and Table 3 on determined percentage of total variance explained, it has been perceived that percentage of total variance explained was the same prior to and after Varimax rotation, which is 50,949%. The difference was in characteristic values and saturation of some factors prior to and after rotation. Because the final number of factors is usually not determined solely according to Kaiser-Meyer-Olkin test, Cattell's personality factors test was also used.

TABLE 2. CHARACTERISTIC ROOTS AND PERCENTAGES OF EXPLAINED VARIANCE PRIOR TO VARIMAX ROTATION

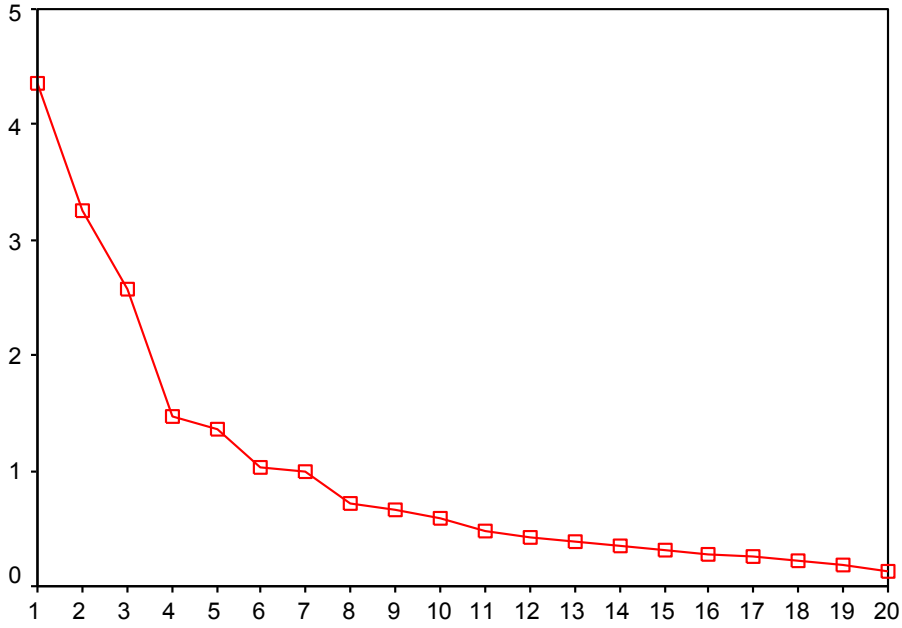
Main components	Characteristic root	Percentage of explained variance	Cumulative percentage of explained variance
1.	4,366	21,828	21,828
2.	3,245	16,225	38,053
3.	2,579	12,896	50,949

TABLE 3. CHARACTERISTIC ROOTS AND PERCENTAGES OF EXPLAINED VARIANCE AFTER VARIMAX ROTATION

Main components	Characteristic root	Percentage of explained variance	Cumulative percentage of explained variance
1.	3,787	18,934	18,934
2.	3,673	18,363	37,297
3.	2,730	13,652	50,949

Analysis of the Diagram 1 shows that there are three obvious points. The most conspicuous is the one at the third factor. These points are also present at the sixth and the seventh factors. It is now common to choose three factors because it corresponds to the previous criterion on factor choice according to values of characteristic roots.

DIAGRAM 1. CATTELL TEST AVALANCHES AS A CRITERION FOR THE EXTRACTION OF A NUMBER OF FACTORS



The first factor defines nine items: 3, 8, 20, 5, 15, 6, 1, 10 and 14. The second factor defines six items: 19, 17, 4, 18, 2 and 16. The third factor defines five items: 2, 7, 11, 13 and 9 (Table 4). The data also show that all items saturate one factor each, except for items 1, 9 and 13 that saturate two factors each.

TABLE 4. ROTATED MATRIX OF FACTOR STRUCTURE ACCORDING TO VARIMAX CRITERION			
Component			
	1	2	3
f3	**,723**		
f8	**,704**		
f20	**-,673**		
f5	**-,665**		
f15	**-,632**		
f6	**,601**		
f1	**,589**	,338	
f10	**-,501**		
f14	**-,338**		
f19		**,789**	
f17		**,777**	
f4		**,756**	
f18		**,744**	
f12		**-,724**	
f16		**,569**	
f2			**,813**
f7			**,812**
f11			**,696**
f13	-,415		**,475**
f9	,331		**,474**

All communalities values are higher than 0,30 and have values ranging from (h=0,341) at item 16 – *I do not have a daily contact with the educators because it would seem more as a matter of protocol than of true significance for my child's education*, to (h=0,729) at item 7 – *I am not very regular on the days given for parents' visits to kindergarten* (Table 5).

TABLE 5. FACTOR MATRIX WITH COMMUNALITIES	
CLAIMS	h
Cooperation once a week is the most effective type of cooperation with educators.	,477
I would learn many things if I were included in some kind of mutual improvement with educator.	,718
Socialization of children is most successful during constant cooperation with educators.	,594
Educators regularly provide me with information helpful in creating working activities in my child.	,601
Whenever I have a problem regarding the upbringing of my child, I ask educator for help.	,465
Exchanging information with educators helps me influence a psycho-physical development of my child properly.	,461
I am not very regular on the days given for parents' visits to kindergarten.	,729
Information I get from educator help me significantly in education and upbringing of my child at home.	,559
Parents' meetings do not have a great importance, because one educator cannot successfully work with all parents at the same time.	,363

TABLE 5. FACTOR MATRIX WITH COMMUNALITIES	
CLAIMS	h
Whenever I see educator, I learn something new.	,360
Due to my busy schedule, I often contact educator only once in a month.	,514
Mutual work with educators can significantly contribute to more efficient preparation and realization of pedagogical activities.	,541
Usually I make contact with educators directly, while I use telephone and Internet only when I am absent from home for a longer period of time.	,402
Common field trips including educators and parents would significantly improve educational process and children upbringing.	,174
Compatibility of parents' and educators' attitudes would significantly improve moral education of their children.	,421
I do not have a daily contact with the educators because it would seem more as a matter of protocol than of true significance for my child's education.	,341
I always give educator information about esthetic affinities of my child.	,711
Many educational activities in the kindergarten could be successfully realized if parents would take part in those instead of external other guests.	,622
I would gladly take part in and be directly involved in the realization of educational activities in the kindergarten.	,680
Only to educator can I openly reveal all problems that I have with my child's upbringing.	,456

According to the first factor that explains 18,934% of the total variance (Table 3) and it has been named *Learning from educators,* it can be noted that parents believe they must have at their disposal certain knowledge in order to be more successful in educating and upbringing of their children. They also believe that educators can provide necessary help due to their professional experience and expertise. However, practical examples indicating to positive results of parents learning from educators are meager. The reason is because the cooperation between parents and educators so far amounted to mutual exchange of information with the objective of "… being informed about all moments in child's life important for his/her development, both in the family and the kindergarten" (Митић, Корене 1989, 48). It has been observed that the mutual exchange of information between parents and educators was more formal and pro forma than truly oriented towards parents' learning and preparing them for more effective educational process and upbringing of their children.

Modern insights in the field of pedagogy, psychology and other sciences indicate the need and importance of mutual learning which is considered to be a path to the open education. What is especially important in this process is parents' learning from educators. Many analysis and surveys conducted recently all over the world prove this point (Lam and Kwong 2012; D'Angelo et. al. 2012; McComrick et. al. 2016; Sak et. al. 2017). Mostly, they confirm that children improve faster if their parents are involved in

their educational process. It has also been concluded that routine practice of parents learning from educators for the purpose of more effective engagement in their children's educational process has not been established.

The first factor indicating the need and importance of parents to learn from educators makes it necessary for the educators to consider and plan the possibilities of parents' involvement in detail. In order to be successful, educators' competence is a key precondition (Клеменовић 2010). This is why every educator should create a separate mutual and learning framework plan for every child, taking into consideration individual development level of the child and also general opportunities for children and/or a group of parents. The research (Markschark et. al. 2012; McClay et. al. 2012; Crosnoe and Ansari 2015) showed that educators should be initiators, motivators and directs implementers of the parents' learning program. There are also studies about numerous cases of parents who, aware of the significance of their direct engagement in the educational program, suggested themselves program curriculums for active involvement in implementation of educational activities in kindergartens from different fields: knowledge (Winter et. al. 2012), sex (Wooden and Anderson 2012; Alldred and Fox 2016), information technology (Blau and Hameiri 2012) and others. The first established factor in this research was mostly coherent with the mentioned results because parents included in the research have also valued to the highest degree the factor indicating the need and importance of learning from educators.

It is evident that scientific and professional literature clearly indicates the need and importance of parents' learning from educators. Parents/educators cooperation is in the literature mostly denoted with the phrase "consultative work". Consultative work is a highly significant form of cooperation, primarily in the matters of children's problems which could not be adequately or successfully solved only by parents, that is without educators' help. Besides, this form of cooperation can help parents gain fundamental knowledge in how to be a more successful parent and educator to their children in everyday life.

In European countries, with their well developed systems of parents' learning for the purposes of their active engagement in educational process in kindergartens, every educator, at the beginning of a work year, creates a plan including meetings, mutual activities and learning with parents. This plan is not a final document. It can be changed and adjusted according to concrete needs. The program about parents' learning from educators should not be a document that originated on theoretical premises but the actual needs of enabling parents to take active part in the educational process in the kindergarten, which were based on immediate educational practice.

Such practice, however, has not been established in kindergartens in Bosnia and Herzegovina. The same can be said about Serbia and other countries of South-Eastern Europe, where this practice exists but only partially. Slovenia and Croatia are exceptions to this routine since in both of these countries there are

kindergartens working according to Montessori Method or Waldorf School. However, it can be said that parents' learning is still a problem that will not be adequately solved in near future.

Second significant factor, which was highly valued by the parents, is a factor concerning *Mutual work with educators.* This factor explains 18,363% of the total variance (Table 3). Parents are increasingly aware that kindergartens should not be simply institutions for babysitting while parents are away at work, but significant educational institutions that greatly contribute to the overall development of children. This is why parents become more and interested in educational process in kindergartens. All of this results in increasing their awareness of the need and importance of active engagement in educational activities in kindergartens.

Besides, parents increasingly become aware that it is important for their children to continue with the educational process at home, after they return from the kindergarten, and in compliance to previously coordinated pedagogical attitudes with educators, or, as Stanisavljević claims, „...children's stay in kindergartens does not release their parents of their obligation to educate their children at home" (Станисављевић 1998, 6). Many other studies agree with such claims and also indicate the significance of the parents' involvement in the educational process in kindergartens (Lau et. al. 2011; Tazouti et. al. 2011). To put it differently, it all comes to the conclusion that role of kindergarten is not to take place of the parents in the educational process but only to fill in that place for a brief period, that is, while parents are away from the home. This was also confirmed by the estimate of parents who valued highly in this research the factor indicating the significance and need for their mutual work with educators in realization of educational activities and actualization of overall educational process in kindergartens.

The importance of mutual work between educators and parents in realization of educational activities is emphasized in other studies. In one of them (Fung and Cheng 2012), the authors discuss a different approach to mutual work between educators and parents in realization of educational activities in kindergartens. They specify the need for educators and parents, especially in preparatory preschool groups, to mutually participate as much as possible in a number of educational activities in kindergartens and furthermore emphasize that parents often avoid direct participation in realization of the educational activities because, according to the results of this research, they have not been trained enough for them. Compared to the results presented in this research, it can be concluded that there is a certain difference because the parents who participated in this research have undoubtedly shown that not only have they been aware of the importance and the need but also that they want to be directly involved in realization of the educational activities in kindergartens.

There are also studies which show that parents do not see their direct participation in the mutual work with educators as a guarantee for a more effective educational activity. According to those results, the

effect will show only if parents have been included in educational work in the kindergarten as assistants, where the special emphasis is given on inclusive work in the kindergarten, first of all in bilingual educational activities (Schwartz and Moin 2012), but also in analysis of the educational activities concerning the tradition and language (Moin et. al. 2011) or in the special approaches concerning children who, from the aspect of a group, show unacceptable behavior (Kirves and Sejaniemi 2012; Koro Ljunberg et. al. 2011). However, these results should not be completely connected, especially taking into consideration the fact that, in this research, the assessments of the parents that could be linked to the inclusive educational work in kindergartens were not analyzed.

The studies of the educational efficiency of the mutual cooperation between educators and parents have shown that this form of cooperation does not always give positive results. That this is the case has been proven by other studies that show that participation of the parents in the activities in the kindergarten, depending on specific situation, gives effects only for the child whose parent is included in the mutual work with the educator (Каменов, Петров 1986). According to another research, parents' participation in realization of the educational activities in the kindergarten is a disrupting factor exactly for the child of the parent who is involved in the mutual work with the educator (Лукић Хавелка 1985). Obtained results mostly concur with the ones extracted from this research. Persons included in the research sample were mostly reserved towards educational efficiency of their direct involvement into the realization of the educational activities in kindergartens. This has also been supported by the fact that they valued the third group of factors averagely, referring to the most common educational effects of the cooperation with the educators; these are the factors referring to socialization, correct psycho-physical development and identification of the child's affinities, but also to the upbringing at home, adjusting to everyday working activities and moral development of a child.

However, regardless to the obvious contradictions and congruence of the results presented, it can be positively claimed that the mutual cooperation between parents and educators definitely has a significant contribution in realization of the educational activities in kindergartens. One of the biggest advantages of such cooperation between a parent and an educator is that you continuously monitor the overall development of a child. Additionally, having spent time in the kindergarten, a parent has the chance to directly observe all the children in a group and on that basis, to perceive every detail in the life of their and other children as well. This means that the parents' participation in the mutual work with educators contributed to the disruption of conventional parents' behavior amounting to basic worries about whether a child ate, slept, played or something similar, and motivated them to observe their children's behavior inside the group, the relationship with other children, their involvement and showing interest during the activities. Spending time in the kindergarten, "… a parent has more time and more possibilities to be

introduced to every detail of the organization of the work in the kindergarten, to difficulties and problems in the work caused by the objective and subjective factors" (Vukomanović et. al. 1989, 54-55).

Direct involvement of the parents into the mutual work with educators in the kindergarten creates the opportunity for the completion of the parental role. By getting involved in the life and work in the kindergarten, a parent leaves everlasting influence on their child but also on other children, and that stays present even when they are not there (Продановић 2008). Additionally, the trust that the children get this way is important because, by creating the atmosphere of parents' engagement where in children's activities the parents are also involved, they generate the similar image between the family atmosphere and the one in the kindergarten, therefore making their life in the kindergarten even more beautiful.

Partner relationship between parents and educators has multiple advantages for children. Adjusted educational attitudes of parents and educators help children in overcoming the feeling of dual morality and double evaluative orientations: "my mom allows me to do this but my educator doesn't or vice versa" (Вукомановић et al. 1989, 58). The effects of the direct cooperation between parents and educators can be easily and quickly checked through child's personality traits - joy, laughter and cheerfulness are proofs of such positive effects. Another proof of educational efficiency of mutual cooperation between parents and educators is a moment when a child wishes to go to the kindergarten and comes back home satisfied.

The third factor, most highly valued by parents, is *Mutual training with educators.* This factor explains 13,652% of the total variance (Table 3). Such estimates are mostly in accordance with numerous theoretical discussions published in Serbian journals (Вилотијевић 2002; Каменов 2006). All these consider mutual work with educators as specifically important factor in realizing parents' role. This cooperation between parents and educators was mentioned in pedagogical and andragogical sources from the early 70s as well as more recent publications (Станојловић, 1999; Савићевић, 1980). However, regardless the extreme importance that mutual improvement has today, this type of cooperation has not been widely implemented neither in pedagogical theory nor in preschool educational practice.

Results gathered in this research are significantly different from those published in journals in other parts of the world. For example, the comparative research about mutual improvement of educators and parents, conducted in 2008 in Spain and Cyprus, showed different results regarding parents' estimates about the significance of their involvement with educators (Martinez Gonzales et. al. 2008). In Spain, there are more parents who believe in the importance of their mutual improvement with educators than is the case with parents from Cyprus. To some extent, this is understandable because the sample including parents from Cyprus consisted of people living in Turkish part of Cyprus. This statement is based on the fact of the traditional nature of Islamic culture, which divides the roles of learning and upbringing leaving the previous to school and later to family. The number of Turkish children included in preschool education

programs was also inadequate. So, it should be no surprise that this comparative analysis gave such differing results.

One research (Van der Oard et. al. 2012) showed parents' estimate that only mutual improvement with educators can provide necessary knowledge and lead to successful education and upbringing of children.

Another research (Symeuo et. al. 2012) showed results significantly different from those defined in this research. It was determined that parents believe that the biggest reason for their mutual improvement with educators is actually their successful communication with educators. Of course, these were not the only estimates by parents included in the research. Reasons for such estimates should be looked for, as in previous cases, in their volume, that is the fact that here only one of the problems of importance of mutual parent/educator improvement was analyzed.

The factors established in this research point to importance and need for mutual improvement of parents and educators but they also indicate that this field is still underexplored regardless of many publications and papers on the topic. Reasons for such state are numerous. One of them is that the present studies represent only fragmented attempts in analyzing certain aspects of mutual improvement of educators and parents.

Former analysis showed that mutual improvement of educators and parents is primarily important for parents. This type of cooperation between parents and educators can significantly contribute to parents' gaining the lacking knowledge in educational process, as well as positive educational attitudes and skills from various fields that can help them become better partners to educators in implementation of educational activities in kindergartens (Продановић 2008). This is why parents are eager to take part in the improvement process together with educators.

The significance this cooperation has should not be relativized or perceived only from the perspective of parents' significance. Mutual improvement of educators and parents is equally important for educators as well. The leading approach of studying this problem is systemic activity that enables the presentation of cooperation between all participants in the educational process: parents, educators and children. In one study (Latipov et al. 2016) it is shown a program of a developed and implemented family society program for the organization of a social partnership of pre-school educational institutions and families, where the coordinating role belongs to preschool teachers. It was not devised as a form of school improvement but as an interactive educational process including parents. In such circumstances, educators have a chance to learn many things from the parents of the children in their group. Parents work in different fields and different professions. Some of them are teachers, university professors or other professionals with higher education and this could benefit not only educators but other parents involved in the mutual improvement process. Thus, the open education could be initiated with parents learning from educators and vice versa.

When planning the curriculum for mutual improvement of parents and educators, it is necessary to take into consideration the content itself, but also parents' level of education and their professional knowledge; these are the preconditions of any successful mutual improvement. Research results from immediate pedagogical theory and practice prove this point (Лаковић 2009; Петровић, 1998). These studies determined that a dominant model of mutual improvement of educators and parents are not traditional lectures but their mutual activities. Therefore, these programs should be directed towards the function of gaining knowledge and experience both in the cases of educators and parents.

Conclusion

Research on the personality of educators and parents, but also their roles and competencies are becoming more and more complex. By addressing these problems, the authors sought to promote educators and parents of the new age. The need to explore in more complex way the educator and parent is the refocusing of researchers' attention to new aspects of their pedagogical and personal habit. Starting from these facts, in this paper a connection between the theoretical approach to the problem of research and its empirical part has been established. The aim of this relationship was to achieve as much success as possible in understanding the essence and character of cooperation and pointing out the importance of the cooperation of teachers and parents and the need for its modernization in order to be able to achieve educational work in a kindergarten.

Not many studies in Bosnia and Herzegovina were published recently regarding the cooperation between parents and educators and proper ways of providing better support to preschool children in their development. The factors established in this research show that the parents of kindergarten children are aware of the fact that kindergartens have become institutions for child caring and babysitting while parents are away at work. Parents find it necessary to learn from educators, in order to become their equal partners in realization of educational activities in the kindergarten. At the same time, parents estimate that they should also improve together with educators. This is why preschool institutions and societies have obligation to give parents opportunities for pedagogical improvement, because it is the way to the open education, two-way learning and knowledge economy. If this is not the case, then parents will be left out from immediate engagement in their children's activities in kindergartens and, as mentioned previously, educators would not be able to solve all of the problems in preschool education solely by themselves.

Primarily, parents have become aware that they should be concerned for their child especially when leaving them to the care of other people, and that they lack necessary knowledge and upbringing techniques important for proper child education. This is why it is necessary to enable parents pedagogically and prepare them for cooperation with educators. In these circumstances, parents' motivation to be involved and pedagogically capable to cooperate with educators becomes a factor of the greatest significance. Positive result of this partnership between parents and educators will definitely

influence efficiency in overall educational process in the kindergarten. We believe that it would be justified to find a model for cooperation between educators and parents which should then contribute to the process of transferring the educators' experience and necessary knowledge to parents so that they can be efficient partners in implementation of educational process in the kindergarten. Answers provided by parents in this research show their willingness to learn from educators, and thus represent, in a broader sense, a right way to the open education and knowledge economy. We take this to be an optimistic insight, although the open education is still not a part of routine practice in kindergartens in Bosnia and Herzegovina. The results of this research can be an incentive for new similar analysis

References

Alldred, P., Fox, N., 2016. "Engaging parents with sex and relationship education: A UK primary school case study", Health Education Journall 75 (7), pp. 855-868.

Blau, I., Hameiri, M., 2012. "Teacher-Families Online Interactions and Gender Differences in Parental Involvement through School Data System: Do Mothers Want to Know More than Fathers about Their Children?", Computers & Education 59 (2), pp.701-709.

Crosnoe, R., Ansari, A., 2015. "Latin American immigrant parents and their children's teachers in U.S. early childhood education programmes", International Journal of Psychology 50 (6), pp. 407-409.

D'Angelo, A., Rich, L., Kohm, A., 2012. School Engagement among Parents of Middle School Youth. Chapin Hall Issue Brief, University of Chicago, Chicago.

Fung, C., Cheng, D., 2012. "Consensus or Dissensus? Stakeholders' Views on the Role of Play in Learning", Early Years: An International Journal of Research and Development,32 (1), pp. 17-33.

Harris, R., 2012. "Parents, Teachers Tout Classroom Councils to Boost Engagement", Education Digest: Essential Readings Condensed for Quick Review 77 (7), pp. 29-30.

Jumiaan, I., Ihmeideh, F., Al-Hassan, O., Omaya, M., 2012. "Using Computers in Jordanian Pre-School Settings: The Views of Pre-School Teachers", Australian Educational Computing 27 (1), pp. 28-33.

Karkkainen, K., 2012. "Bringing about Curriculum Innovations". OECD Education Working Papers, No. 82., OECD, Paris.

Kirves, L., Sejaniemi, N., 2012. "Bullying in Early Educational Settings", Early Child Development and Care 182 (3-4), pp. 383-400.

Koro Ljunberg, M., Bussing, R., Wilder, J., Gary, F., 2011. "Role of Communication in the Context of Educating Children with Attention-Deficit/Hyperactivity Disorder: Parents' and Teachers' Perspectives", Journal of School Public Relations 32 (1), pp. 41-75.

Lam, Ch., Kwong, W., 2012. “The Paradox of Empowerment in Parent Education: A Reflexive Examination of Parents' Pedagogical Expectations”, Family Relations 61(1), pp. 65-74.

Latipov, Z.A., Bykova, S., Zhigalova, M.P., 2016. “The Family Club Activities for Organizing a Social Partnership of the Pre-School Educational Institution and the Family”, International Journal of Environmental and Science Education 11 (5), pp. 655-662.

Leung, C., Lo, S., Shirley, S., 2012. “Validation of a Questionnaire on Behaviour Academic Competence among Chinese Preschool Children”, Research in Developmental Disabilities: A Multidisciplinary Journal 33 (5), pp. 1581-1593.

Ludicke, P., Kortman, W., 2012. “Tensions in Home-School Partnerships: The Different Perspectives of Teachers and Parents of Students with Learning Barriers”, Australasian Journal of Special Education 36 (2), pp. 155-171.

Markschark, M., Bull, R., Sapere, P., Nordmann, E., Skene, W., Lukomski, J., Lumdsen, S., 2012. “Do You See What I See? School Perspectives of Deaf Children, Hearing Children and Their Parents”, European Journal of Special Needs Education 27 (4), pp. 483-497.

Martinez Gonzales, R., Symeou, L., Alvarez Blanco, R., Roussounidou, E., Igliesias Muniz, J., Cao Fernandez., M., 2008. “Family Involvement in the Education of Potential Drop-Out Children: A Comparative Study between Spain and Cyprus”, Educational Psychology, 28 (5), pp. 505-520.

McClay, J., Peterson, S., Nixon, R., 2012. “Parents and Communities as Partners in Teaching Writing in Canadian Middle Grades Classrooms”, Middle School Journal 44 (1), pp. 44-52.

McCormick, M.P., Cappella, E., O'Connor, E., Hill, J.L., McClowry, S., 2016. “Do Effects of Social-Emotional Learning Programs Vary by Level of Parent Participation? Evidence From the Randomized Trial of INSIGHTS”, Journal of Research on Educational Effectiveness 9 (3), pp. 364-394.

Moin, V., Schwartz, M., Breitkopf, A., 2011. “Balancing between Heritage and Host Languages in Bilingual Kindergarten: Viewpoints of Russian-Speaking Immigrant Parents in Germany and in Israel”, European Early Childhood Education Research Journal 19 (4), pp. 515-533.

Pugh, G., 1987. Lynncroft Primary School, Nottingham, National Children’s Bureau, London.

Sak, R., Şahin Sak, I.T., Ayyürek, O., Taşkın , N., 2017. “A Qualitative Study of Preschool Teachers as Parents”, Turkish Online Journal of Qualitative Inquiry (TOJQI) 8 (2), pp. 272-290.

Salazar, M., 2012. “Home-School Collaboration for Embedding Individualized Goals in Daily Routine”, Young Exceptional Children 15 (3), pp. 20-30.

Schwartz, M., Moin, V., 2012. “Parents' Assessment of Their Preschool Children's Bilingual Development in the Context of Family Language Policy”, Journal of Multilingual and Multicultural Development 33 (1), pp. 35-55.

Sudduth, Ch., 2011. Our Voices: A Descriptive Account of African American Parental Involvement in an Urban Elementary School. Northern Iowa: ProQuest LLC, Ed.D, Dissertation, University of Northern Iowa.

Symeuo, L., Roussounidou, E., Michaelides, M., 2012. “I Feel Much More Confident Now to Talk with Parents: An Evaluation of In-Service Training on Teacher-Parent”, Communication. School Community Journal 22 (1), pp.65-87.

Tazouti, Y., Viriot Goeldel, C., Matter, C., Geiger Jaillat, A., Carol, R., Deviterne, D., 2011. “French Nursery Schools and German Kindergartens: Effects of Individual and Contextual Variables on Early Learning”, European Journal of Psychology of Education 26 (2), 199-213.

Turunen, T., 2012. “Individual Plans for Children in Transition to Pre-School: A Case Study in One Finnish Day-Care Centre”, Early Child Development and Care 182 (3-4), pp. 315-328.

Van der Oard, S., Bogels, S., Pejnnenburg, D. (2012). “The Effectiveness of Mindfulness Training for Children with ADHD and Mindful Parenting for their Parents”, Journal of Child and Family Studies 21(1), pp. 139-147.

Winter, L., Morawska, A., Sanders, M., 2012. “The Effect of Behavioral Family Intervention on Knowledge of Effective Parenting Strategies”, Journal of Child and Family Studies, 21 (6), pp. 881-890.

Wooden, Ch., Anderson, F., 2012. “Engaging Parents in Reproductive Health Education: Lessons Learned Implementing a Parent Designed, Peer-Led Educational Model for Parents of Preteens”, American Journal of Sexuality Education 7 (4), pp. 461-473.

Вилотијевић, Н., 2002. Породична педагогија, Београд, Учитељски факултет Универзитета у Београду.

Вукомановић, Н., Касагић, Ђ., Коруга, Д., Марковић, М., Павловски, Т., Ћебић, М., 1989. Родитељи у дечјем вртићу, Завод за уџбенике и наставна средства, Свјетлост, Београд, Сарајево.

Илић, М., 2010. Породична педагогија, Филозофски факултет Универзитета у Бањалуци, Наставнички факултет Универзитета Џемал Биједић у Мостару, Бањалука, Мостар.

Каменов, Е., 2006. Образование предшколске деце, Завод за уџбенике и наставна средства, Београд.

Каменов, Е., Петров, Н., 1986. Методика на васпитно-образовната работа со децата од предучилишна возраст, Просветно дело, Скопје.

Клеменовић, Ј., 2010. "Значај укључивања родитеља у програме предшколског васпитања и образовања", Зборник Одсека за педагогију Филозофског факултета Универзитета у Новом Саду, 12 (23-24), 78-94.

Лаковић, З., 2009. "Предшколска установа и друштвена средина – средина за развој и учење", Педагошка стварност, 55 (7-8), 803-812.

Лукић Хавелка, Д., 1985. Породица, дете, дечији вртић, Дечије новине, Горњи Милановац.

Маринковић, С., 1995. Неки покушаји трансформације дечијег вртића у отворени васпитни систем, Институт за педагогију и андрагогију Филозофског факултета Универзитета у Београду.

Митић, Р., Корене, З., 1989. Родитељи у дечјем вртићу, Завод за уџбенике и наставна средства, Свјетлост. Београд, Сарајево.

Петровић, М., 1998. "Усавршавање васпитача и стручних сарадника за нове основе програма", Настава и васпитање, 47 (2), 310-320.

Продановић, Љ., 2008. Сарадња просветног радника с родитељима, Агенција за едукацију и услуге Профикомп, Београд.

Самарџић, М., Травар М., 2016. "Компетенције васпитача за сарадњу са родитељима", Нова школа, часопис за теорију и праксу савремене школе и предшколства, 11 (1), 156-168.

Савићевић, Д., 1980. "Планирање и програмирање сарадње породице и школе", Настава и васпитање, 29 (3), 469-476.

Станисављевић П., З., 1998. Сарадња породице и вртића, Напредак, Лесковац.

Станојловић, Б., 1999. Породица и васпитање деце, Научна књига, Београд.

INNOVATIVE TECHNOLOGIES IN EDUCATING STUDENTS AS A MOTIVATIONAL MECHANISM

EVDOKIYA PETKOVA, VASILISA PAVLOVA

Technical Faculty, South-West University "Neofit Rilski" Bulgaria

e-mail of corresponding authors: e.p.petkova@swu.bg, vasy_pav@abv.bg

Key words: motivation, education, students, innovative approaches.

Abstract: The preparation of experts capable of adapting to a society with changing socio-economic conditions is one of the most important issues relating to the education of students in higher education institutions. The problem of modern pedagogy is the lack of interest in students to learn and acquire knowledge.

After entering university they wish to ascertain what is perceived necessary for their future life or to learn enough to meet their own needs, but over time for some of them the motivation disappears, while for others, for various reasons, the motivation decreases with time. Therefore, the problem of student motivation for learning becomes relevant in the modern university.

In this connection, it is necessary to find mechanisms for the formation of students' motivation so that they would be able to purposefully influence it, in which teachers will be able to effectively manage the learning process, increasing the interest of students to study subjects in their chosen profession.

By using pedagogical and psychological mechanisms for motivation, university lecturers will be able to improve the quality of the educational process and its outcomes. Under a harmonized system of teacher-student relationships, scholars will consciously address their needs and make plans for the future based on real motives.

In the field of technology and entrepreneurship, the training purposes are related primarily to the professional development of students, the formation of qualities, skills and knowledge that will help them find their place in a fast-growing, highly competitive world of new technologies, opportunities and challenges.

One of the most important tasks of higher vocational education is the training of future teachers in technology and entrepreneurship, capable of innovative activities. At the current stage of development of the system of higher education it is believed that it is important for the graduates to be carriers of technology culture and modern innovative technologies in order to achieve projected objectives. The process of modernization of vocational education determines the need for qualitative changes in the system of professional training of graduates from university.

Introduction

Motivation is one of the main conditions for the realization of targets. And since the needs and interests of individuals are the foundation for their motivation, it is logical to conclude that in order to achieve good results, the student has to ensure training is a desirable process. In this context, the motive is seen as targeting the student to various aspects of academic work related to their inner attitude towards it.

The basis for motivation is a need that has not been satisfied. This thesis is a basic component of the foundation most established theories about the essence and functions of some types of motivation lie on. Theories of motivation are subdivided into content, procedural and theories of maintenance.

Content theories are based on the basic needs that motivate people.

These include: Maslow's Mastery Needs Hierarchy, ERG - Alderfer's Theory, McLaughlin's Theory of Motivation through Achievements, and The Two-Factor Theory of Herzberg. Silagi (1992) One theory that stands out amongst others about the essence of motivation is that of Abraham Maslow.

In his theory Maslow suggests that there is a hierarchy of human needs that determine the behaviour of the individual. Maslow offers five types of needs, which represent their order of importance. They

can be categorised as: physiological; security; social; appreciation and respect; and self-development. These can be divided into two categories. The first one reflects the needs of a lower level or deficit needs - physiological and security. The second covers high-level needs - social, valuation and respect, and self-actualization that cannot be reached by everyone, especially in their work. Ilieva (2009, 160)

Later Clayton Alderfer further developed the Maslow's hierarchy of needs into three levels, with a newly created concept being called ERG theory, /existence, commitment, growth/. According to the author of this concept, there are three key needs: need of existence; need for binding; and growth - which is the inner drive for self-development, or self-realization, self-actualization according to Maslow.

Like Alderfer, David McClain reduces the five motivational needs defined by Maslow to three. According to his theory, motivation for work is based on needs of a higher level. They are not biological and universal but socially acquired. In other words he believes these groups of needs are acquired through learning. Three groups of needs are identified as the most important: the need for achievement; the need for inclusion; and the need for power. Later in McLaughlin's scheme has been added a fourth need - "for competence". **Procedural theories** give particular attention to the processes that direct the individual to act in one way or another.

According to procedural theories, personal behavior is a function of his perceptions and expectations associated with a given situation as well as the possible consequences of the chosen behaviour. This group of theories is usually considered to be more useful for the practical management of human resources, because it is the basis for the use of motivational techniques. The subject of attention here is Adams' Theory of Advancement, Theory of Expectations, Theory of Motivation by L. Porter and E. Loourl, Theory of Goals, and The Theory of Validation.

The theory of justice (equality) was created in 1963. By J. Stacey Adams. It states that workers are motivated by the desire to be treated equally and fairly. The concept of expectations is formulated and presented in 1964 by several scientists, including the psychologist Victor Vouum, as a selection management process. Vuum perceives motivation as a function of three inconsistent individual characteristics, which he calls expectation, instrumentality and valency that derive from the relationship between effort, activity and consequences or rewards. The beginning of the theory of goal setting is put by Edwin Loke with his work "On Theory of Motivation and Stimulating Goals". He believes that individual conscious goals and intentions are the first determinants of behaviour. That's why his theory emphasizes the importance of conscious goals for motivated behaviour. Objectivity requires that before Lokke, a number of management positions with the help of goals are also covered in the writings of Peter Drucker and Douglas McGregor.

The most common model describing the goal-making process consists of the following steps:

- awareness of the environment in terms of emotional state;
- establishing objectives defining the direction and intensity of actions;
- implementing the actions;
- satisfaction with the results.

According to the theory of targeting, the level of performance depends on four characteristics of the objectives: complexity, specificity, acceptability, attractiveness. They influence both the ambition and the effort that one is willing to spend in order to achieve the goal. For these characteristics, the following regularity is valid: "the more complex target a person has, the better results he will achieve" It has been shown that more specific and defined goals lead to better results and better performance.

Sufficiently clear and logically designed the theory of targeting is not so simple for a practical realization, as there is no single path to it. It does not have the versatility of the application. Also, there is no definitive answer as to who and how to set the target, uncertainties arise, and when deciding who the subject of an individual or group target is cannot be given a clear answer where the stimulation should be directed

This group of theories is based on the development of the theories of support by BF Skinner, united around the notion that human behavior is formed by its consequences. Vilunas (1990)

Based on in-depth research into Skinner's Theory, psychologist Albert Bandura develops the next step in Motivational Theory - The Theory of Social Knowledge. The basic idea is that cognitive processes are carried out continuously by the interaction of three main factors: the realization of targets behaviour of a person, his personal qualities and the environmental influences. Everyone affects the surrounding reality, and in turn determines how he thinks and acts. This perception is particularly valid with regard to the definition of a particularly important specific type of motivation - the motivation for learning, which can be considered both as a general feature of the personality and as a condition determined by the situation. This specific type of inner state provides motivational energy towards the realization of concrete behaviour and the achievement of pre-set goals in the learning process.

The proper organization of the learning process fosters a positive motivation for learning activity and stimulates the development of cognitive interests that once formed are becoming effective internal factors for improving the quality and efficiency of learning activity.

Academic motivation of the student can be considered as internal readiness, containing their attitude and dedication towards the learning process, as an internal condition for their academic success as an indicator of the thought work, including the quality of teaching. Academic motivation stimulates the demand for new knowledge, the positive attitude towards the learning process, the active aspirations to

achieve and absorb the new, as reflected by the student according to their significance for the individual.

Motivation for learning in academic education

Motivation in learning is important for engaging students with academic activities and determining the extent of learning used in the curriculum. Students who are motivated to study use wider cognitive processes to achieve their goal There are a number of specific actions the lecturer can take to increase motivation.

In general, fall into two categories: internal (including explaining the importance of information, maintaining curiosity, providing different incentives, setting goals and tying them to needs, etc.) and external (including providing feedback, engaging in activities, awarding awards, clear expectations, etc.) motivation.

In this context, a variety of tools can be identified to increase the effectiveness of learning by developing cognitive motives based on research-based learning - applying new learning methods.

Like any other type of motivation, learning motivation is determined by a number of factors specific to this activity. They can be presented as follows:

- the specifics of the subject;
- organization of the learning process;
- technologies used in training;
- the subjective characteristics of the student, the teacher and the effective interaction between them;
- effectiveness of methodological materials developed, how they are presented and how to use them;
- Feedback effectiveness.

All these factors, taken together, determine the degree of formation of cognitive motivation in the student. Moreover, one should not overlook the fact that each student has his / her peculiarities and, accordingly, a motivational sphere.

The main force in the development of all kinds of learning activities for students is the intensification of their educational activities. This can be done in different forms of learning, with a variety of methods and tools.

Various pedagogical strategies contribute to the development of constructive motivation for learning, the most effective of which, according to the experts, are:

- Creating a suitable learning environment.
- Setting and achieving realistic goals.

• Support initiative in learning.

• Making constructive feedback and external control and more.

Objective, hypothesis and tasks of the study

The objectives of the study are as follows:

A) development and experimentation of a motivating didactical model, including a system of pedagogical strategies, technologies and techniques, and teaching didactical materials for improving the quality of the students' training.

B) studying the level of academic motivation of the students on a regular and extra-term basis in the subject "Pre-primary and primary school pedagogy"

On the basis of the purpose of the study we have formulated the following working hypothesis: If a system of strategies, technologies, techniques and didactic materials are implemented in the course of engineering education for students in the field of Pedagogy of Technology and Entrepreneurship Education, which not only facilitates the learning of the educational content, but support and enhance motivation for learning, the level of academic motivation of students will increase.

Establishing reinforcing motivation and higher cognitive achievements through adequate diagnostic technology will be used as evidence of the relevance and appropriateness of the developed motivational didactic model.

Tasks of the study

A) Planning, organizing and conducting a pedagogical experiment to check the effectiveness of applying a motivating didactical model to improve the quality of training of students in the field of Technology and Entrepreneurship Education.

B) Performing a comparative analysis of the data on the status and level of academic motivation of the students of the specialty - full-time and part-time training.

C) Evaluation of the achievements of the students in the subject of Pedagogy of Technology and Entrepreneurship Education, full-time and part-time training.

A general characteristic of educational technology based on a motivating didactical model

In the structure of the developed motivational technology are presented the main components (target, program-content, operational-activity combined with the motivational component and control) of the learning process.

The structure of a motivating didactic model in the engineering graphics training of students of the specialty Pedagogy of Technology and Entrepreneurship Education contains the following components:

A) Target component: Targeted build up of positive academic motivation

B) Program-content component - Adapted and selected information on graphic disciplines.

C) operational component:

• Motivational learning tools - ICT as a means of enhancing motivation for learning;

• Motivating Didactic Technology - Includes methods and means of presenting information, how the teacher impacts on students using information and technical means. In the didactic technology, content, methods and learning tools are linked

D) Controlling component - questionnaire and test methods

• External control - intermediate and final

• Internal control - self-control

The educational technology project combines a sequence of processes and activities of the subjects of the training in the realization of pre-set goals. Structurally, the technology (motivational didactic model) includes specific "tools" (methods, procedures, tools) that help to stimulate the regulatory and voluntary potential and the ascending development of the cognitive processes of the students.

The educational technology project combines a sequence of processes and activities of the subjects of the training in the realization of pre-set goals. The guiding principle for design, development and implementation of educational technology is based on a motivational approach with a purposeful harmonious combination of learning and motivation for learning.

The external control with its variants (intermediate and final results) is performed by the lecturer as a reliable tool indicating the functioning of the developed methodology in the various stages of the experiment. Internal control is strictly individual to each student and manifests itself as a degree of self-control.

Motivating didactic technology

The training is considered as a dialectical process and therefore the system of learning methods should be dynamic, taking into account the changes that occur in the practice of their use.

A good knowledge of the advantages and disadvantages of traditional learning methods is a necessity for effective learning and the development and implementation of new methods will lead to enriching the procedural side of learning technology.

Learning methods are amongst the most important components of learning technology with an extremely complex structure. Through them, the main strategic directions of the training process are realized, its goals and tasks are achieved. According to Churukova et al. (2000, 103) " the methods of teaching and learning that are selected and used depends on whether the students will be able to apprehend the necessary study materials and interest in learning, respond to the continually arising challenges as exciting intellectual prospects in their activity, or they will look to her as something that leaves no lasting marks in her mind, is not accompanied by creativity, joy and satisfaction, with

spiritual enrichment." For the training to function optimally, the methods used must be adequate to the educational and development objectives.

The teaching technology includes methods and means for presenting information, how the teacher impacts on students using information and technical means. In learning technology, content, methods and learning tools are linked

Graphic-based learning technology includes the methods and tools that can be used as an environment for transfer of knowledge and information: computer, audio-visual, internet-based ICT (Information and Communication Technology) systems and others. For this purpose, the technical equipment - the hardware must be "revived" by means of appropriate software for the provision of teaching materials made according to contemporary pedagogical theories.

Based on research and the proven need to apply computer graphics products to technology and entrepreneurship education, it is practical to use Google SketchUp to teach future teachers. Three-dimensional computer modelling with Google SketchUp and its application in technology education shows a new "virtual" world full of creativity and professionalism.

The technology of Engineering Graphics training is based on an approach that is characterized by the combination of ideas, methods and research solutions from the scientific fields of psychology, pedagogy, methodology and others with technical developments in the field of ICT. By integrating the technical tools and methods, conditions are created to achieve an optimal learning environment in which an effective learning process is carried out. It is essential to implement the traditional methods of teaching and consolidating knowledge by applying new technologies to learning.

The development of information technologies contributes significantly not only to the improvement of the graphics preparation methodology but also to the overall rethinking of the teaching approaches.

New technologies provide the opportunity, through the use of specialized software and hardware, to perform activities that would hardly be feasible with classical learning tools.

The use of innovative methods in student graphic design, along with traditional learning methods, increases the efficiency of learning, leads to higher results of knowledge, skills and competencies.

The main variants of applied computer technologies in education are:

A) "Penetrating" technology - using computer-based training: on selected topics, sections, for individual didactic tasks, combined with traditional teaching methods.

B) "Monotechnology" - when all the training, the whole management of the learning process, including all types of diagnostics, monitoring are based on the use of a computer.

With the help of computer technology, the following tasks can be solved:

- forming skills to work with information, developing communicative skills;
- striving to introduce the person into the "information society";
- to give as much study materials as one can.
- to create research skills and the ability to make optimal decisions.

In the process of learning Engineering Graphics, the "Penetrating" technology is applied, which enables the ability to acquire knowledge, to form skills and motivation for learning, necessary to create the conditions for absorbing knowledge and skills as much as possible.

By using this technology, for a time, the learner's attention is transferred to the computer and the trainer is able to observe, capture the trainees' manifestations, such as the awareness of the desired goal, the active perception of the knowledge gained so far and the interest in supplementing the missing knowledge through new sources and independent search. This allows the lecturer to manage and gradually develop his or her own work.

With the development of ICT technologies, we are confronted with different concepts and technologies applicable to learning such as: Cloud computing, which provides through its cloud technologies the ability to organize WEB-based training. The WEB-based training also uses the corresponding WEB-based technology platforms. They are integrated e-learning software solutions, providing a set of tools for teaching and learning new knowledge, skills and attitudes to promote and steer the learning process towards using a computer and the Internet. Tosheva (2016, 192).

In support of the increasingly widespread application of cloud technologies, the implementation plan of the Strategy for the effective implementation of ICT in education and science (2014-2020) has been launched.

This is also the Augmented Reality concept and its QR code marker tool. The building of an expanded reality in technological training and more precisely in graphic design creates the basis on which modern knowledge, skills and competences are formed and developed. The well-organized virtual learning environment is based on the idea of learners getting a new and, attractive view of the teaching content, a prerequisite for learning efficiency.

Using them helps to involve more students in the learning process as a quick, reliable, and convenient way to instantly access the learning content. They save time and are motivated to learn efficiently. Their use in technological learning, apart from being effective, diversifies learners' activities and creates more interest in the subject. Pavlova (2014)

ICT in the learning process allows not only to diversify the forms of presentation of the curriculum, but also to exert effective control over the learning process.

With the use of modern computer technologies, regular checks are made to control the educational activity (through a computer test program "UniTeSys"), which allows analysis of the causes for the errors, allowing the students to self-control and correct their cognitive activity.

Connection with the students is also accomplished by applying a constant and systematic study of their opinion on the training they receive. In the training on graphic disciplines an inquiry is conducted in order to initiate a dialogue between the teachers and the students, which provides better quality of teaching, training and learning environment. The survey provides information to lecturers on how students assess their teaching activity and their participation in the educational process to assess the level of academic motivation.

The questionnaire covers aspects of education such as teacher competency and pedagogical skills, curriculum content, form of test, requirements for passing the course, communication between the teacher and the students, and the learning environment. It is important that the consultation is a constant practice and that student opinion be studied at the completion of each discipline.

To conclude, we can say that in order to improve the efficiency of the learning process, changes and innovative additions to the teaching methodology have been sought, as well as ways to increase student motivation. Computer technologies increasingly entering formal and informal learning along with other pedagogical approaches are a valuable tool for implementing innovative learning strategies. ICT-based teaching methods contribute to motivating and stimulating the interest and activity of learners and respectively to better learning outcomes.

Empirical methods of research

The creation of a motivating didactical model structured on the basis of the integral nature of contemporary methodology, psychology and pedagogy, which is practical in the field of graphic design for students at Southwestern University, is the aim of research and approbation.

The completion of the research requires the application of adequate empirical methods through which it is possible to diagnose the manifestations of a motivating didactical model in the real training environment.

In the study, the following methods were used accordingly:

• **Survey:** An individual anonymous poll assesses the academic motivation of the students using the "Questionnaire for Assessing the Level of Academic Motivation"

• **Didactic Test - Critical-Didactic Testing** (applied during the different stages of the pedagogical experiment) as a method of measuring and evaluating the achievements of learners. The computer test system "UniTeSys" was used to assess students' knowledge of graphics disciplines.

Analysis of the results of the study

This survey was conducted in groups with the following fields of study: Technology and Entrepreneurship Education (WTT) First year students of full-time and part-time training. A total of 62 students were surveyed. An individual anonymous questionnaire evaluated their academic motivation using A. Velichkov (2005), containing eleven statements: 7 for high academic motivation and 4 for low. Estimates are obtained as the sum of the values of the responses to the claims. This methodology offers 4 variants of response (disagree, rather disagree, rather agree and agree). The survey was conducted twice.

The method used is designed to measure academic motivation, understood as a construct describing the general motivational state generated and related to HEI education. According to the results, the academic motivation of the students is divided into 3 grades - low, moderate and high. No account was taken of the presence of students from the studied specialties, where the absence of academic motivation was reported.

The results of the conducted study are presented in Table 1.

TABLE 1. RESEARCH RESULTS LEVEL OF ACADEMIC MOTIVATION FOR STUDENTS OF THE SPECIALTY PEDAGOGY OF TECHNOLOGY TRAINING AND ENTREPRENEURSHIP

Degrees of academic Motivation	Specialty			
	WTP – full-time study		WTP - part-time study	
	At the beginning of the training (1)	At the end of the training (2)	At the beginning of the training (1)	At the end of the training (2)
High	32%	61%	29%	60%
Moderate	58%	33%	53%	38%
Low	10%	6%	18%	2%

The same results are presented graphically in Chart 1 and 2 below.

CHART 1. LEVEL OF ACADEMIC MOTIVATION OF STUDENTS - FULL TIME STUDY

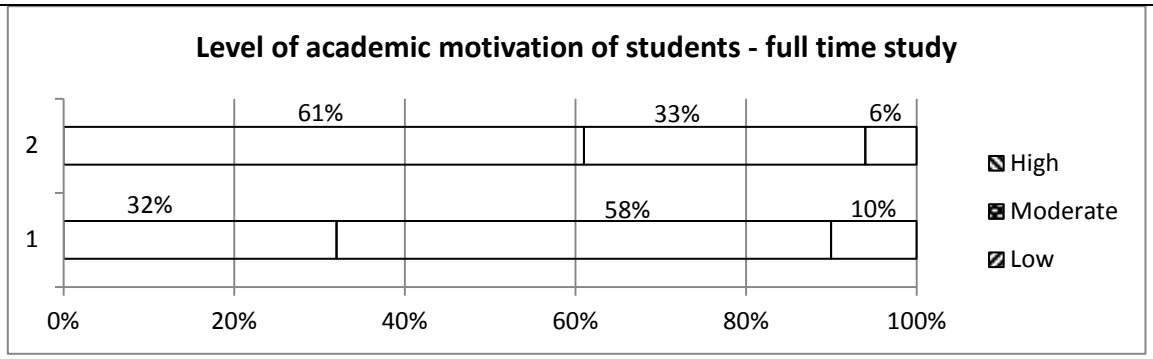
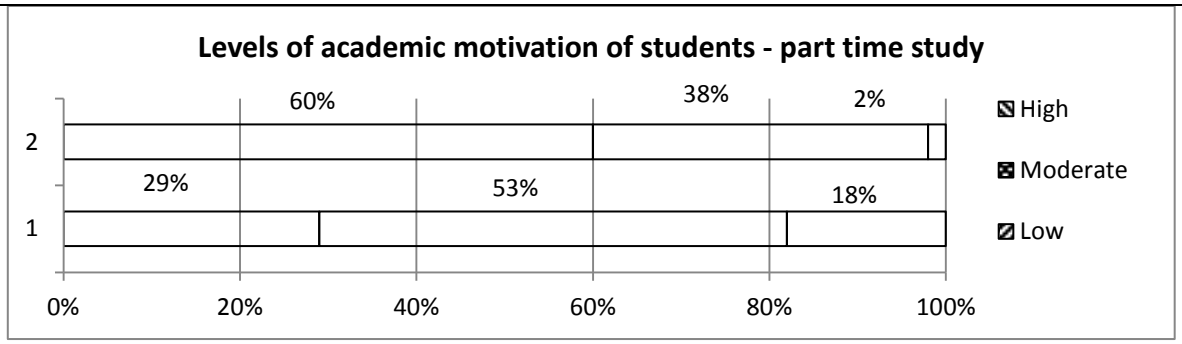


CHART 2. LEVELS OF ACADEMIC MOTIVATION OF STUDENTS - PART TIME STUDY



The obtained data shows that the degree of academic motivation for both study groups has increased at the end of the training compared to the starting point.

Highest (61%) is observed in students of first-year full-time education, which also account for 6% of students with low motivation. Similarly, the state of motivation and contingent students are students of the same specialty - part-time form of study where the academic motivation, assessed as high is 60% and low - 2%. These results show that the students in the studied specialty (in full-time and part-time form) present lower motivation at the beginning of the course which then increases as the course progresses.

In the critical-didactic test, applied during the different stages of the pedagogical experiment as a method of measuring and evaluating the achievements of the students, the results are similar and are presented in Table 2

TABLE 2. RESULTS OF MEASUREMENT AND EVALUATION OF THE ACHIEVEMENTS OF TRAINING IN THE SPECIALTY PEDAGOGY OF TRAINING IN TECHNOLOGY AND ENTREPRENEURSHIP				
Grades	Specialty			
	WTP - full-time study		WTP – part-time study	
	At the beginning of the study (1)	At the end of the study (2)	At the beginning of the study (1)	At the end of the study (2)
Fail 2	7%	0%	5%	1%
Fair 3	23%	13%	30%	15%
Good 4	30%	23%	29%	24%
Very Good 5	27%	39%	27%	29%
Excellent 6	13%	25%	9%	31%

The graphical results are presented in Diagram 3 and Diagram 4.

CHART 3. RESULTS OF EVALUATING TESTS OF STUDENTS - FULL-TIME STUDY

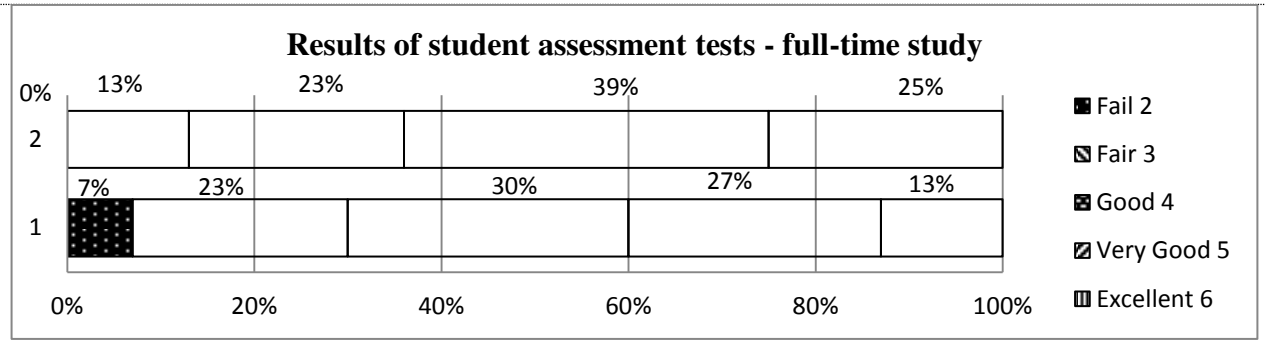
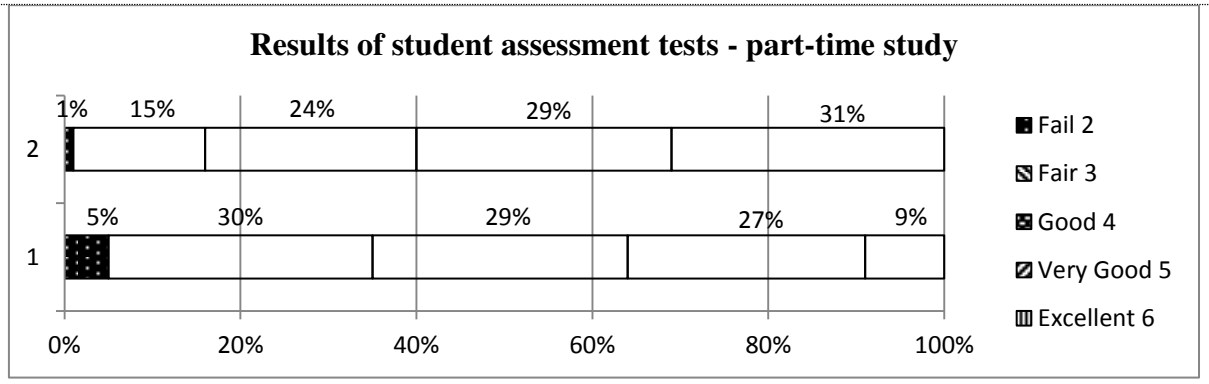


CHART 4. RESULTS FROM GRADED STUDENT PAPERS - PART-TIME STUDY



Analysis shows that high academic motivation is the reason for the high academic success of students. Higher academic success is associated with higher academic motivation.

Higher levels of academic motivation were generally reported among students in full-time training compared to the part-time students. The groups of students surveyed have stated that they are looking for real and lasting knowledge of the subject, especially the acquisition of practical skills, not just an

increase in their theoretical knowledge. The established high-level data on academic motivation also outlines some aspects of the personality characteristic of the students in the pedagogical field, as the high academic motivation is part of the active driving forces of the self-upgrading personality and an indicator of its future successful professional development. High academic motivation stimulates the quality and intensity of cognitive activity towards the achievement of the pre-formulated goals, the acquisition of new knowledge and skills, the use of adequate strategies to achieve high academic results in the learning process. An important parameter of the assessment of the state of academic motivation is also the low percentage of people with low academic motivation. In the case of students in part-time study, for example, low academic motivation was not registered at all (0%).

Whatever the level of motivation that individuals have in the learning environment, it can be elevated or lowered, depending on what is happening in their environment. There are many factors that can influence students' motivation for learning, including: interest in learning content; perceiving the usefulness of learning information; self-confidence and self-esteem; and patience and perseverance.

Increasing academic motivation has a positive effect on personal satisfaction with achievement, low levels of anxiety and reflects ongoing efforts to overcome the fear of failure in the learning process in a timely manner. Increasing academic motivation does not only depend on external factors. Of great importance are the personal aspirations for self-improvement of each student, curiosity, and creative thinking. The results obtained are an indication of the need to apply measures to preserve and raise the interest of learners in an academic activity, based on the following statements:

• Stimulating and developing high academic motivation among students - future educators first of all have to understand the purpose of learning in terms of developing personal qualities and exploring themselves.

• Timely feedback between students and lecturers is of utmost importance for the quality and efficiency of the learning process. This allows students to assess when and to what extent they have achieved the pre-formulated goals and succeeded. This leads to an increase in the level of personal satisfaction, competence, and greater confidence in defining future goals. Feedback emphasizing personal progress in the learning process is extremely effective and stimulates individual personality development. Feedback emphasizes and stimulates individual self-confidence, promotes analytical and critical thinking, improves performance, and results in higher learning outcomes.

• The implementation of motivated professional training of students is of utmost importance using the current strategies and methods, activating the training.

Conclusion

Based on the results obtained from the diagnostics at the level of the academic motivation of the students from the mentioned pedagogical field, the following conclusions were drawn:

1. The high percentage of the students in the studied field in full-time and part-time training, which show an increase in the level of academic motivation, is indicative of a good quality of teaching but is also a prognostic factor for their academic achievement. Students are well motivated to study in their chosen pedagogical field.

2. The availability of an optimal academic motivation in the students to acquire the necessary theoretical and practical knowledge is one of the parameters for achieving the learning outcomes. The results of the study on the state of academic motivation of the studied student groups outline the need for active strategies to stimulate adaptive activity (motivation for success) as well as creativity to limit the number of students with medium and low academic motivation.

Given the importance of this type of motivation for personal and professional development, and the achievement of high standards and quality of training for experts in the field of technological education, thorough and detailed research, exploring the dynamics of motives and driving forces that determine students' interest in academic activity, is required in future.

References

Churukova, L. Et al., 2000. Didactica, Blagoevgrad, 2000.

Golenkova, O., et al., 2012. Innovative technologies and methods of training in the professions of education Кн. 2., Scientific and Innovation Center.

Ilieva, S., 2009q Values and Labor Motivation, University Publishing House "St. Kliment Ohridski, Sofia.

Plachkov, S., 2013. “Harmonizing the competency profile of the teacher in technology training with the European Qualifications Framework “ Journal for information technology, educational development and teaching methods of technical and natural sciences, 3 (1), pp. 1-5.

Pavlova, V., 2014. “Knowledge Management and Expanded Reality in Technology Education“. I Scientific Conference Contemporary Strategies and Innovation in Knowledge Management, Univ. BIT, Sofia.

Silagi, E., 1992. Motivation, Information Publishing Bureau, Varna.

Radoslavova, M., A. Velichkov.2005. Methods for psycho-diagnostics.

Tosheva, E., 2016. “WEB BASED E-LEARNING PLATFORMS“, International Conference on Information Technology and Development of Education - ITRO 2016. Zrenjanin, Republic of Serbia.

Vilunas, VK 1990, Psychological Mechanisms Motivations Man. M., Publishing MGU.

APPLICATIONS FOR TEACHING INFORMATICS ON PRIMARY SCHOOLS

HEDVIGA PETRUŠKOVÁ, MILAN LEHOTSKÝ

Faculty of Education
Catholic university Ružomberok, Slovakia

e-mail of corresponding author: hedviga.palasthy@ku.sk

Key words: educational applications, Informatics education, programming environments, information and communication technologies.

Abstract: At present the use of information and communication technologies and equipment is a necessity in the education. The content of the course Computer Science was developed depending on the state of technology. The great shift occurred in the types of the solved tasks and problems.

This paper presents educational applications in the programming language Scratch. It includes tasks appropriate for teaching algorithms on the 1st level of primary school and for the teaching hardware on the 2nd level of primary school. The first part is devoted to the subject Informatics education, textbooks and deals in the learning environment. The second part deals with the methodological aspect of teaching algorithms on the primary school and the programming environments suitable for learning algorithms in the elementary school. In the third part the application is created in a programming environment for teaching hardware.

Introduction

The didactic games have bigger and stronger position in a process of education. The didactic game is a form of education, where a pupil is active. The human experiences the word and he meets with the games in an early stage of his life. Therefore, the game is a part of his life. Not only children, but also the adults encounter with games in an altered essence. The game develops independence, interest in the concrete activity, creativity and activity. The games find their application in education, and the educational process become more natural and popular for pupils. The pupil loses his fear, he is not nervous and consequently he is pulled into the game so he does not realize the educational effect of the game. The didactic games find their application not only in the first level of primary school, but also in the classes with older students and they can present other subjects not only in the classes of Biology, Physical education, Informatics... (Petlák 2004, 10)

A proper realization of games is very important. On the other hand, wrong application of the game can cause undesirable competition between the students and later it can lead to the conflicts not only during the game but also during the socializing part of education. Every game should have its good reasons and follow certain aims.

Educational standard

The educational standard comprises from characteristics and targets of the object. These are determined more concretely by the performance standard. The performance standard contains cognitive gradual performances which the teacher can specify and broaden in an educational targets, tasks and questions regarding to student´s skills. The content standard connects performance with the curriculum into the prescribed thematic units.

The subject of Informatics belongs to the science where the student does not learn only theoretically, but also tries to learn practically. Then the subject of Informatics contains two parts: acquisition of skills

during a work with computer, concretely its software and hardware and its theoretical knowledge about informational technologies.

Performance standard from the thematic scope software and hardware is composed from following parts:

- Work with files and folders,
- Work with operating system,
- computer and additional devices,
- work with computer network and internet,
- programs against viruses and spying.

The hardware and its individual parts and devices are concentrated under the name Computer and additional device. The content standard is various regarding a year. The fifth and sixth year include programs for processing dates, solving the problems, keyboard, mouse, screen, memory media, etc. The content standard for the seventh and eighth year contains detailed hardware of a computer: Processor, memory, long-term storage devices, output devices (headphones, speakers, printer, scanner), devices for digitalization (camera, microphone, camera) also this topic overlaps with software. (ŠVP 2014).

Education of programming environment Scratch

Scratch was developed at the Media Lab of the Massachusetts Institute of Technology (MIT). The National Science Foundation of the United States of America is responsible for its funding. Scratch 1.4 version was created first. The newer version in which the didactic hardware game is also created is Scratch 2.0 version. It can be used in online or off-line versions.

Scratch is a modern children's programming language used mainly at the second level of elementary schools. Its appearance and environment is primarily intended for children and teenagers from the age of eight. The program environment is designed to allow young programmers to create simple games, programs, animations, fairy tales or music. After arranging a few commands, student immediately sees the graphically processed result of his work. In a process of creating a program he gradually develops both logical thinking and creative thinking. (Kulha 2016, 8-9)

Scratch contains many characters and backgrounds of different types and categories that the programmer can use or modify. In addition, it offers the ability to draw or edit directly in the program, to insert personal pictures and to take direct snapshots. To make the environment more attractive and easier for children, commands are distinguished in the colour rectangles. The program is created by simple moves of commands, which are distinguished in colours and are translated into Slovak. Commands fit in like a puzzle. Student can verify the functionality of the linked commands immediately in a real-time after the

activation of the animation. The activation of the program is realizable by clicking on the green flag or by clicking on the figure in the resulting area.

The Scratch environment and its applications in practice are very broad. Scratch is designed especially for children and teenagers. Its application can be found mainly at primary and secondary schools. Furthermore, application of Scratch can be found in other subjects not only during the lessons of Informatics. The entire site, including the official website, is translated into 76 languages. Pupils can work on their projects together and learn also how to work in a group. They can design some programs that will find their application in other lessons e.g. Mathematics, Biology, Geography, Physics, Chemistry, History, but also on other subjects. It offers the possibilities of inserting or more precisely drawing their own characters and scenes, it opens new possibilities for creative thinking, creating new stories or games. (Resnick 2014, 8-9)

ScratchEd is created for teachers. It is available at http://scratched.gse.harvard.edu/. Here, they can share and show their thoughts about more effective teaching of this program, offer their experiences and their continuous education. (ScratchEd. 2017) Scratch itself is developed for children from the age of eight. For younger children in the age of 5 - 7, the ScratchJr programming language is created. The ScratchJr environment is reworked Scratch environment. The children fit in similar colour blocks with graphic images. Therefore, the selected characters can dance, sing, move and jump. They can add their own sounds, voices, pictures. The ScratchJr programming language is available as an iPad application with Android system. Its latest version is 1.2.3. Similary as Scratch, ScratchJr can be obtained free of charge. It is accessible on AppStore or Google Play. The home page is http://www.scratchjr.org/. (ScratchJr. 2017)

Very similar principles of learning how to programme, which a Scratch also requires, are possible to find online. Code Studio and Galaxy codr have the following properties.

Code Studio

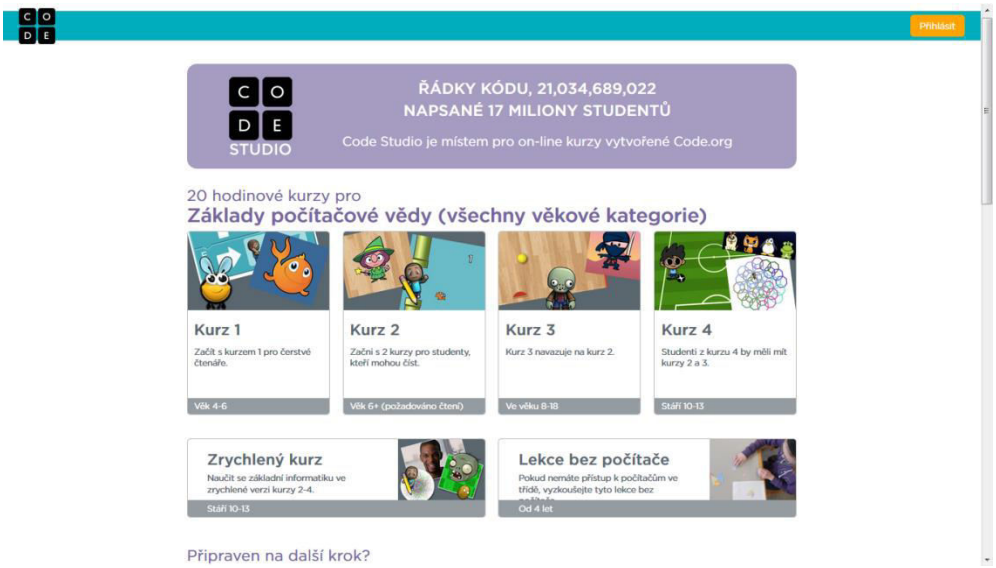
Code Studio includes on-line courses of programming for children on the Internet. It is a non-profitable organization with a visual programming language on the Internet. Its founder is Hadi and Ali Patro. The organization was established in 2013 with aim to capture attention of pupils and students in the United States and girls. It presents idea of possibility to learn informatics and programming of each student on every school. They have created an online learning environment for teaching programming in collaboration with companies like Google, Facebook, Microsoft or Twitter and many others. The entire programming environment and to a large extent the website, are translated into many world languages. Student selects the language at the beginning and can watch a promo video.

Webpage (Chart 1) with a modern layout brings various types of courses for all age categories of children. These courses are divided into 4 grades according age of child:

- Course1 for children from 4-6 years,

- Course 2 for children from the age of 6,
- Course 3 for children from 8-13 years,
- Course 4 for children older than 10-13 years.

CHART 1 WEBSITE CODE STUDIO

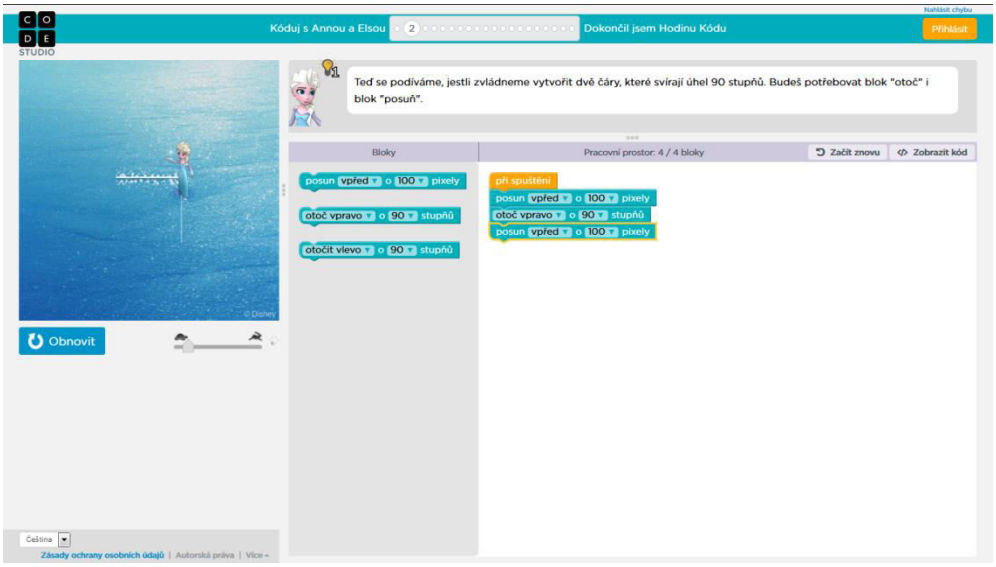


Source: https://studio.code.org/

Each course is adapted to a 20-hour mode, focusing on activities with and without a computer regarding appropriate age group. There is a description of each course with its purpose at the beginning of each course. In the beginning the lecture contains a fun video or video tutorial for a better understanding. These videos are mostly accompanied by subtitles in a given language. The chapters of the courses can be saved in PDF format and can be used off-line or printed. It is also possible to pass accelerated courses or just chapters without a computer which is advantageous for schools that do not have enough computers. For the children older than 13 years and for those who are more experienced in programming, there is App Lab available after signing in. It is a programming environment suitable for secondary grade schools. Pupils learn to use JavaScript and can program simple applications. Sign up for webpage https://studio.code.org/ is possible as a pupil or as a teacher. Compared to signing up for Scratch Community, there is an option to sign in with Google, Facebook or Microsoft account. Even unlogged users can try an hour of code. The organization is supported not only by large companies in the field of ICT, but also by creators of the well-known games such as Minecraft, Angry Birds, Plants vs. Zombies and animated cartoons - Frozen, Star Wars and others. (Studio Code 2017)

After launching, the interested person enters an environment very similar way as in Scratch (Chart 2). The pupil learns to control the character by sequential connecting of commands in colour block. The progress in the game also increases the difficulty of creating a program. The student can verify his / her code immediately and find out if he / she worked correctly.

CHART 2 LECTURE IN CODE STUDIO



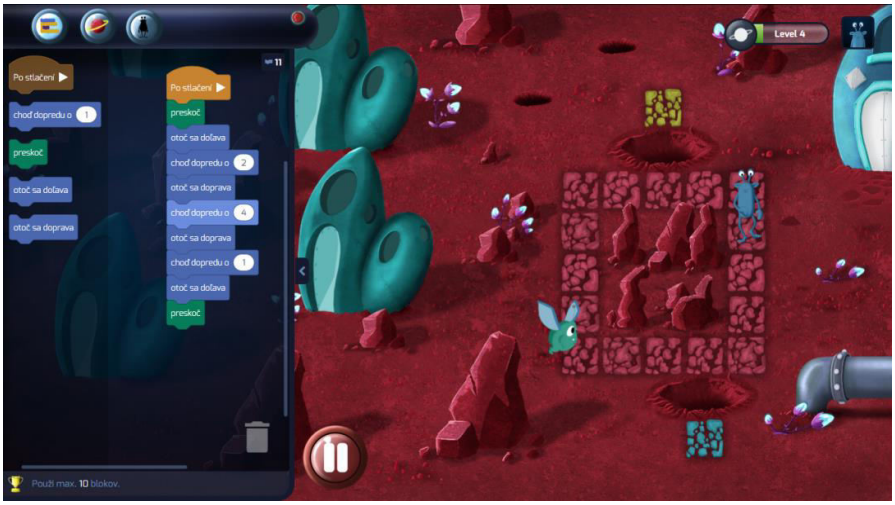
Source: https://studio.code.org/s/frozen/stage/1/puzzle/3

Galaxycodr

Galaxycodr is an interactive didactic game designed for children from 7 years old. It is appropriate to use it for teaching of Informatics in the second and the third year of elementary schools. Students will get basic algorithmic thinking by funny way. The game supports both logical thinking and pupils' imagination. It can happen that pupils immerse into the story of the game and can experiment. Gradually, it increases the difficulty and pupils can learn programming completely independently. The entire game and description is available for free on website http://galaxycodr.com/sk/.

After activation (Chart 3) a child is pulled into the space adventure with two nice characters. Spike and Tim are friends with the same interests. Tim is kidnapped by two unknown creatures from another planet. In order to find Spike, his friend must pass through all the planets. These planets symbolize more challenging programming problems. The pupil controls Spike by using commands in blocks that connect similarly as in Scratch. Then we can start the game. Very nice sound and detailed graphic processing with the moving characters will give the pupil feedback on his steps. Everything is accompanied by animations and if the pupil makes a mistake he continues to repair the code or he experiments to help the main character get to the next level, closer to his friend. He passes through the individual tasks on the planets step by step and he gets points. After a sufficient number of points, he gets a card with a new planet's inhabitant. Each task contains a challenge to use the maximum number of blocks. The better the pupil programs moves and uses fewer blocks he gets more points and a new card. It motivates a pupil to experiment and create a more complicated, but more effective program. (Galaxycodr 2017)

CHART 3 GAME GALAXYCODR



Source: http://galaxycodr.com/game/

The game and website are fully localized in four languages - Slovak, English, German and Czech. The educational game Galaxycodr was created and launched in February 2017. The game was developed by IT companies from Bratislava, which are engaged in new technologies, innovations, development of educational projects for children and youth. In order to run the game, one needs a computer with internet connection. The game is still available for computers, but we can also expect a tablet application. (Baumann 2017)

Didactic game Hardware

The theme of didactic game is the computer hardware. The game is dedicated to pupils in the second level of elementary schools. The game is designed to help students learn and recognize hardware individually, without the help and interference of the teacher during the lesson. The great advantage of this game is that it improves pupils' imagination and knowledge regarding the placement of parts and the appearance of individual parts of the interior of the computer. The teacher’s substitution is the character of minion outlined in the game. The overall movement of character consists of 21 different costumes. Costumes represent a minion in different animation effects like, for example, talking, waving, and pointing. We used the graphic editor Paint and Gimp2 in order to draw individual costumes. The theme of didactic game is computer hardware.

After a pupil started the game, he is lead to menu (Chart 4). The menu consists of five different types of didactic games on the topic of hardware. These are: Recognize hardware, Input output devices, Motherboard, Pairs game, Puzzle. The game is controlled by the mouse. Minion verifies the pupil's knowledge at the beginning, during and at the end of the game with various questions connected with hardware topic. He ascertains whether a pupil understands the game. After pupil chooses a game from menu, minion makes preselected animation - the banana throw, the jump or reaching out, which starts a

game. Once a pupil selected the task, then he learns rules of a game. Everything is spoken by minion in a form bubbles with words. The only button on the tablet throughout the whole game is the button back. We have created it as an option to return from the task to the menu.

CHART 4 GAME HARDWARE

Source: Own

Each task is specific. All five proposed tasks can be considered as five stages of gradual acquisition and independent verification of knowledge from a game. Firstly, there is a hardware game included. Pupil recognizes the hardware components of a computer, such as monitor, system unit, keyboard, through the game accessories, and the basic internal parts of the computer as power supply, processor, or motherboard. The pupil selects given device, consequently imagine is displayed and enlarged with its name. Minion informs pupil about a device with the help of dialog bubbles (Chart 5). There are totally 26 devices that make up the computer hardware.

CHART 5 FIRST GAME - SPOZNAJ HARDVÉR

Source: Own

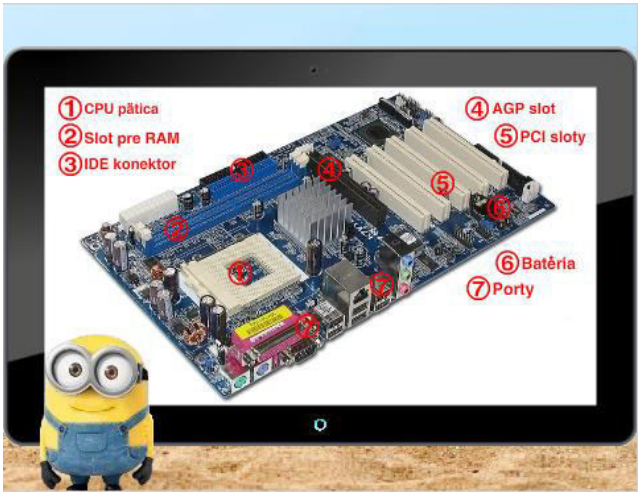
The second game is focused on input output parts of hardware. The pupil in order to pass the task must classify the presented mixed input and output devices. Once it starts, minion explains what is expected from the pupil and then he asks a pupil whether he can distinguish between input and output devices. Depending on the pupil's response, minion explains the topic (Chart 6).

CHART 6 INPUT/OUTPUT ATTACHMENTS

Source: Own

In the third proposed task, the pupil finds the basic components of the motherboard, their description and illustrations. The task consists of the basic parts of the motherboard with the respective components (Chart 7). When pupil starts game, minion briefly explains the pupil motherboard and informs him about the possibilities offered by the mini game. During the dialogue, numbers with the name of the individual parts are displayed along the edges and the motherboard. When you click on a number, the other characters hide and the character presents given part with the help of the dialog bubbles.

CHART 7 MOTHERBOARD



Source: Own

The mini game pair serves to check so far gained knowledge of pupil. This is not an ordinary pair game. The pupil looks for an image of device and he must connect it with its name. In this way, pupils practice not only their attention and memory, but they also repeat parts of the hardware. When pupil selects the mini games from the menu, the character manages the programmed animation and switches from the new environment with the button deal the cards (Chart 8).

CHART 8 MEMORY GAME

Source: Own

The cards themselves contain one character. In total, there are eight cartoon identical pairs, so the game has in total 16 cards. Cards with an image of device are created in Paint graphic editor. The names on the back of the cards and names of devices are created in Adobe Photoshop CS6 graphic software. When the student finds all the pairs, minion gets the message about the successful finding of all the pairs; he praises him and encourages him to choose next game.

The latest mini game which pupil encounters is didactic Puzzle. This game is different from the previous ones. When the pupil chooses this task, he will not get into the first stage of puzzle, but he gets to a new menu. The mini game puzzle includes three puzzle pictures of computers and hardware. Each image is different; it is not just a part of hardware. After the image is done, the pupil learns about a history of this topic as well as about the current state of computers. Three puzzle buttons illustrate three levels of difficulty. Buttons are rounded, differentiated by colour, with small characters of evolving minions. (Chart 9) The button with a green ring and the smallest minion symbolizes the easiest level. The button in the middle means the medium or normal playing level. The last third button with blue ring indicates difficult level.

CHART 9 PUZZLE

Source: Own

Each level is specific either for the number of pieces, by its image or background. Every single piece forms a separate figure. The easiest puzzle contains 9 pieces, the medium puzzle has 16 pieces, and the hardest one contains 24 pieces. The position of each piece is defined approximately +/- on three pixels. It is because each child works with a mouse with a different precision. Therefore, if all pieces are put by their larger part into their place, the condition is fulfilled. If some part is not fitted properly, the pupil has to fix it. The puzzle overlays the original picture, the minion praises the pupil and tell him something about the image with use of dialog bubbles. The button back is still available for the pupil. When the pupil finishes the last picture, the minion praises the pupil, but without the invitation to return to the offer. In the end the minion offers a time for the pupil to take a close look at the picture. After the regulated time, the minion starts to ask the pupil questions about the individual pieces of hardware. Questions are of two types - to choose the right option or to writing a response. He asks seven questions altogether. The proposed game was used in primary school in Lazany (district Prievidza). (Boško 2017, 25-50). The game was created on the topic of hardware, it was tested in the fifth year during Informatics and it was successful.

Conclusion

The main aim of this contribution was to introduce a didactic game in the programming language Scratch, focusing on teaching hardware for pupils of the second grade of elementary schools. The game is freely available on https://scratch.mit.edu/ for easy access and other possible use with accessible source codes for possible modifications. Another partial aim was to introduce the environments - didactic games suitable for the teaching of algorithms and the development of logical thinking of pupils in the second grade of elementary school. It is good to include the didactic games in a classroom, because while a pupil is playing it, he does not even realize that he is learning. In our opinion, learning in a playful form is one of the best ways how to interest a pupil in demanding and otherwise uninteresting subject. The advantage is that both the computer and the program are patient. It does not push a pupil to think in a hurry. This type of learning is easier to captivate pupils with less interest in this subject. Work with computer is more

enjoyable and easier for many pupils. They are not exposed to stress from time and bad answers. The didactic game is more interesting, funnier and suitable for boys and girls, so it becomes more popular not only in class. Therefore, we recommend placing similar didactic games as often as possible in the education process.

Acknowledgements

This article was written within the solution of project TA04031376 „Výzkum/vývoj metodiky výcviku leteckých specialistů L410UVP-E20“. Project TA 04031376 is dealt with financial support of TA ČR a project KEGA 009KU-4/2017 Inovatívne metodiky v predmete informatika v sekundárnom vzdelávaní.

References

Baumann M. 2017. Vzdelávaciu hru GalaxyCodr si už zahralo viac ako 2-tisíc ľudí, http://www.ucn.sk/spravy/vzdelavaciu-hru-galaxycodr-si-uz-zahralo-viac-ako-dve-tisic-ludi, accessed on 19th March 2017.

Boško, D. 2017. Tvorba didaktickej hry v programovacom jazyku Scratch diploma work, PF KU Ružomberok.

Galaxycodr 2017 http://galaxycodr.com, accessed on 19th March 2017.

Kulha, M. 2016. Pracovné listy z programovania pre 2. stupeň ZŠ: záverečná práca. Ružomberok : KU, 2016.

Petlák, E. 2004. Všeobecná didaktika.Bratislava: Iris.

Resnick, M. a kol. 2014. Programovanie pre deti. Brno : Computer Press, 2014.

ScratchEd 2017. http://scratched.gse.harvard.edu/help#what_is_scratched, accessed on 19th March 2017.

ScratchJr 2017. https://www.scratchjr.org/about.html, accessed on 19th March 2017.

Studio Code 2017, https://studio.code.org, accessed on 19th March 2017.

ŠVP 2014. Informatika, http://www.statpedu.sk/sites/default/files/dokumenty/inovovany-statny-vzdelavaci-program/informatika_nsv_2014.pdf, accessed on 19th March 2017.

Keynote speaker‘s abstract

VIRTUALLY OPEN EDUCATION? AUGMENTED POSSIBILITIES OF VIRTUAL REALITIES

PETRA ACZÉL

Faculty of Social Science
Corvinius University of Budapest, Hungary

e-mail of corresponding author: petra.aczel@uni-corvinus.hu

Key words: virtual reality, paradigm shift, knowledge society, learning

Abstract: From the very beginning of virtual reality it was apparent that if the concept were fully realized, the result would be a culture-defining technology" – Myron Krueger wrote in 1993[*]. Almost 50 years passed by after the beginnings of VR and we still see it as a technology that is 'becoming' a part of our everyday life.

Indeed, virtual reality VR seems to be a paradigm-shifting device. It does require us to exchange multitasking for immersion, cognizing for sensing, reflecting for living through. Offering simulated, real-life, or even hyperreal experience VR – together with augmented reality and augmented virtuality – seems to be the promise of our near future which is as close as a Pokémon in our cupboard.

My talk aims to draw attention to the challenges VR-AR creates for institutional education, for individual and cooperative learning. The core question of the presentation addresses the notion of knowledge society and open access from the aspect of virtual reality. How may VR change the ideal of knowledge society and what are the advantages and dangers VR can hold for open access to knowledge and learning? Are school communities open to the usage of VR? What is the success/failure of VR in education dependent upon?

Introducing the results of two recent Hungarian researches on the usage of VR in higher education the talk wishes to reveal the prospects for involving VR in teaching and learning, based on the present state of its implementation and practice.

[*] Myron W. Krueger 1993. "The Experience Society. Presence" Teleoperators and Virtual Environments 2 (2), pp.162-168.). p.

Abstracts

THE ROLE OF PARENTS FOR DEVELOPING DIGITAL LITERACY OF 0-5 YEAR OLDS

LINDA DANIELA, ARTA RŪDOLFA

University of Latvia
Latvia

e-mail of corresponding author: linda.danila@lu.lv

Key words: parental competence, digital literacy, 0-5 years old children

Abstract: The digitalization of the world has brought with it changes in the mutual relationship of parents and children, upbringing traditions and challenged the parents' role. It is vital to improve the parents' competencies for them to be able to promote the development of digital literacy. They are the role models of positive use of digital media and they are the ones that should be able to help children overcome hardships and minimize the risks that could arise in the digital environment. Parents' attitude towards the digital world could be described as "fear and fascination", where a fraction treats the possibilities provided by the digital environment with uncritical adoration, while another fraction is convinced that the digital environment poses a variety of risks, which is why children should be deterred from the use of digital media for as long as possible. None of the approaches is productive in helping the development and growth of children born in the digitalization era, that is why an objective for the study was set out – to identify parents' competence in promoting children's digital literacy in order to seek solutions and make recommendations for parents to promote children's digital literacy.

The article summarizes the results of a part of an ongoing study of parental competence in raising kids of digital era. Next stages of the study will focus on analysing the factors influencing parents' attitude towards digital media and finding solutions to overcome the existing gap between children's desire to use digital media and parental attitude towards it.

At this stage of the survey there are gathered answers from 180 parents (178 parents and 2 grandparents) regarding the habits of using digital media of 0-5 year olds, how parents control the process of digital media use and what kind of problems have they faced?

Partners

General partner

Central European Initiative

The CEI is an intergovernmental forum promoting political, economic, cultural and scientific cooperation among its Member States. Its core mission is: Regional Cooperation for European Integration. In this context, the aim of the political cooperation is to supply the countries and their institutions with a flexible, pragmatic platform for regional cooperation, while focusing on their preparation to a future accession to the European Union (EU). In doing so, special attention is given to capacity building of the non-EU CEI Member States which, thanks to its ideal location, is pursued through know-how transfer and exchange of experience among those countries which are members of the EU and those which are not. The CEI is actively engaged in supporting projects in various areas of cooperation, also through the mobilisation of financial resources providing greater possibilities for studying, financing and executing national and international projects. Also main partner in 2016 and 2013.

Main Partner

Core to our mission is creating immersive and inclusive experiences that inspire lifelong learning, stimulating development of essential life skills and supporting educators in guiding and nurturing student passions. We empower students and educators to create and share in entirely new ways, to teach and learn through exploration, to adapt to individual learning needs, so they can make, design, invent and build with technology.

Partners

AAEI Czech Republic

AAEI Czech Republic is the largest professional association of adult education with tradition since 1990, which goal is to promote interests and needs of adult education institutions, concentrate professional capacities for solution and development in this area, cooperate with state authorities and other subjects in preparation and implementation of legislative and other measures of adult education, organize events for professionals and the general public, publish publications and represent members and their activities with domestic and international associations. Partner since 2012.

Navreme Boheme, s.r.o

is a dynamic and innovative consulting company as well as research-driven SME. Dealing mainly with evaluations (eg impact assessment, cost-effectiveness and evaluations of program interventions financed from public funds), implementation and effective use of information communication technologies (ICT), e-learning and research and development (R& D), especially in the field of information technology, labor market and transfer of innovation. Partner since 2012.

PRADEC

Prague Development Center (PRADEC) is international company offering publishing services, various networking activities to people and institutions involved in variety of educational and science activities. Its mission is to develop a broad range of information sharing products and services in area of education, science, technology and innovations. PRADEC product lines cover producing research journals, publishing scientific works and

reports, organizing seminars, trainings and conferences, developing networking platforms targeted to the global audience. Partner since 2012.

Veriod

Media partners

Andragogika v praxi

AULA

Edumenu.cz

IKAROS

Open Education Europa

RicercAzione