E-learning and Intercultural Competences Development in Different Countries

Scientific Editor

Eugenia Smyrnova-Trybulska

Katowice – Cieszyn 2014

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University of Silesia in Katowice,
Faculty of Ethnology and Sciences
of Education in Cieszyn

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INTRODUCTION

Contemporary societies are marked by new global trends - economic, cultural, technological, and environmental shifts that are part of a rapid and uneven wave of globalization. The growing global interdependence that characterizes our time calls for a generation of individuals who can engage in effective global problem solving and participate simultaneously in local, national, and global civic life. Put simply, preparing our students to participate fully in today's and tomorrow's world demands that we nurture their global competence. (Mansilla V. B,. & Jackson A. 2014)

It has been estimated that the e-Learning market in Europe is developing at an annual rate of 30%. This is a significantly higher growth rate than that experienced by traditional university courses; many universities are now heavily committed to developing, and are involved in delivering, e-learning programmes.

The causes of these changes have included moves in the economy, increased global competition, technological change and demographic trends all of which demand flexible and multi-skilled workers. In turn this flexibility, on the part of workers, is viewed by employers as promoting competitiveness, economic growth and guaranteeing employment. (Simmons J. 2006).

Nowadays, we can observe a rapid transition of the knowledge society to the "society of global competence", in which both the global economy and the education systems are undergoing changes. It is evident that without an active implementation of innovative forms and methods of education, and above all, distance learning at all levels of education these objectives cannot be successfully achieved. At the same time we should identify the existing problem - the fact that e-learning methodology is not yet fully developed and specified, both within the EU and in third countries. As a response to these challenges a monograph has been prepared and the IRNet project has been launched (www.irnet.us.edu.pl).

The monograph "E-learning *and Intercultural Competences Development in Different Countries*" includes the best papers, prepared and presented by authors from eight European countries and from more than twenty-five universities during the scientific conference entitled "*Theoretical and Practical Aspects of Distance Learning*", subtitled: "*E-learning and Intercultural Competences Development in Different Countries*", which was held on 13-14.10.2014 at the Faculty of Ethnology and Sciences of Education in Cieszyn, University of Silesia in Katowice, Poland.

The speakers were from the University of Ostrava (Czech Republic), Extremadura University (Spain), Constantine the Philosopher University in Nitra (Slovakia), University of Twente (The Netherlands), The Lisbon Lusíada University (Portugal), Curtin University in Perth (Australia), Borys Grinchenko Kyiv University (Ukraine), Herzen State Pedagogical University of Russia, St. Petersburg, (Russian Federation), Dniprodzerzhinsk State Technical University (Ukraine), Jagiellonian University (Poland), Warsaw University (Poland), Silesian University in Opava (Czech Republic), University of Silesia in Katowice (Poland), University

of Defence in Brno (Czech Republic), Maria Curie-Skłodowska University in Lublin (Poland), Lublin University of Technology (Poland), Kazimierz Wielki University in Bydgoszcz (Poland), Cracow Pedagogical University (Poland), Centre for Innovation, Fryderyk Chopin University of Music in Warsaw (Poland), Dragomanov National Pedagogical University (Ukraine), State Higher Vocational School in Krosno (Poland), Cardinal Stefan Wyszyński University (Poland), University of Social Sciences and Humanities in Warsaw (Poland), Poznań University of Medical Sciences (Poland), Adam Mickiewicz University in Poznań, (Poland), Centre for Higher Education Studies in Prague (Czech Republic), University of Social Sciences and Humanities in Warsaw (Poland), University College of Social Sciences, Częstochowa, (Poland), Jesuit University of Philosophy and Education "Ignatianum" in Cracow (Poland) and other educational institutions.

The authors include well-known scholars, young researchers, academic lecturers with many-years' training and experience in the field of e-learning, PhD students, distance course designers, writers of multimedia teaching materials, designers of web-sites and educational sites.

I am convinced that the monograph will be an interesting and valuable publication, describing the theoretical, methodological and practical issues in the field of the use of e-learning for societal needs, offering proposals of solutions to certain important problems and showing the road to further work in this field, allowing for exchange of experiences of scholars from various universities from many European countries and other countries of the world.

This book includes a sequence of responses to numerous questions that have not been answered yet. The papers of the authors included in the monograph are an attempt at providing such answers. The aspects and problems discussed in the materials include the following:

- contrastive analyses and evaluation of the ICT and e-learning competences in different countries;
- e-learning methodology which is not yet fully developed and specified, both within the EU and in third countries;
- information and educational environment of blended learning: aspects of teaching and quality;
- intercultural aspects of higher education in globalisation world;
- e-learning as an innovation methods and techniques in the different education system;
- the legal, ethical, human, technical and social factors of ICT and e-learning development and the state of intercultural competences in different countries;
- effectiveness and quality of e-learning in various areas of science and education;
- ICT competence in modern school and university;

- formal, non-formal and informal distance education and LLL;
- a new role and possibilities of using e-learning for lifelong learning (LLL);
- teachers' and learners' competences in distance learning and computer science;
- a relation between building an information educational environment of the university (school) and forming lecturers' (teachers') ICT competences
- an efficient use of e-learning in improving the level of students' key competences;
- pedagogical and methodical aspects of cloud computing;
- mobile technologies – effectiveness of online technologies used in real education;
- distance learning of humanities as well as science and mathematics – a differentiated approach;
- how to successfully use e-learning in the training of professionals in the knowledge society;
- psychological, cultural and social aspects of distance learning;
- e-learning and social media for the disabled; the use of Internet technology and social media for people with limited abilities and special needs – theoretical and practical aspects of their use;
- appropriate, efficient methods, forms and techniques in distance learning;
- educational strategies to enhance learners' motivation in e-learning, etc.

Publishing this monograph is a good example of expanding and strengthening international cooperation. I am very grateful for valuable remarks and suggestions which contributed to the quality of the publication. Here I especially want to thank Andrzej Szczurek for his assistance in editing this publication. Also, I would like to say 'thank you' to the authors for the preparation and permission to publish their articles. I wish all readers a pleasant reading. Thank you.

Eugenia Smyrnova-Trybulska

I. E-LEARNING AND INTERCULTURAL COMPETENCES DEVELOPMENT IN DIFFERENT COUNTRIES

CONTRASTIVE ANALYSES AND EVALUATION OF THE ICT AND E-LEARNING AND INTERCULTURAL COMPETENCES IN AUSTRALIA, CZECH REPUBLIC, THE NETHERLANDS, POLAND, PORTUGAL, RUSSIA, SLOVAKIA, SPAIN AND UKRAINE WITHIN THE FRAMEWORK OF THE IRNET INTERNATIONAL RESEARCH NETWORK PROJECT

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Abstract: *This article, prepared by an international team of authors - researchers from different scientific areas, connected with ICT, e-learning, pedagogy, and other related disciplines, focuses on the objectives of the international project* ***IRNet.*** *In particular, the article describes research tools, methods and some procedure of the WP2: Analyses of legal, ethical, human, technical and social factors of ICT and e-learning development, and the state of intercultural competences in partner countries: Objectives, Tasks, and Deliverables as well as conceptions and schedule of an implementation of the WP3. The second part of the paper includes data from preliminary research. During the study and analysis of global (international) and local (national) documents as well as university documents Table 1,2,3,4 were prepared which set out a comparison of the legal factors of ICT and e-learning development in all partner countries, for example Poland, The Netherlands, Spain, Slovakia, Portugal, Czech Republic, Australia, Ukraine and Russia in the context of the IRNet project –* ***International Research Network.***

Keywords: International Research Network IRNet, ICT, E-learning, Competences,

INTRODUCTION

Nowadays, we can observe a rapid transition of the knowledge society to the "society of global competence", in which both the global economy and the education systems are undergoing changes. It is evident that without an active implementation of innovative forms and methods of education, and above all, distance learning at all levels of education these objectives cannot be successfully achieved. At the same time we should identify the existing problem - the fact that e-learning methodology is not yet fully developed and specified, both within the EU and in Ukraine.

1. IRNet - International Research Network

Developing and implementation of the system designed to develop IT competences of contemporary specialists, in particular future teachers, current teachers, leaders, based on the systematic use of selected Internet technologies, such as some LCMS systems (as Moodle), Massive Open Online Courses, "virtual classroom" technology, social media, other selected Web 2.0 and Web 3.0 technology positively contributes to the development of skills in the area of IT and intercultural competences. **IRNet - International Research Network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences.** This project is financed by the European Commission under the 7th Framework Programme, within the Marie Curie Actions International Research Staff Exchange Scheme. Grant Agreement No: PIRSES-GA-2013-612536. Duration of the project: 48 months1/01/2014 – 31/12/2017. The IRNet project aims to set up a thematic multidisciplinary joint exchange programme dedicated to research and development of new tools for advanced pedagogical science in the field of ICT instruments, distance learning and intercultural competences in the EU (Poland, the Netherlands,

Spain, Portugal, Slovakia) and Third Countries (Australia, Russia, Ukraine). The programme will strengthen existing collaboration and establish new scientific contacts through mutual secondments of researchers. The main objectives of the project are: 1) to exchange expertise and knowledge in the field of the innovative techniques of education between EU and Third Countries and suggest effective strategies of implementing new tools in their profession; 2) to analyse and evaluate social, economic, legal conditions, as well as methodologies and e-learning techniques being developed in the European and Third Countries involved.

The IRNet project aims to set up a thematic multidisciplinary joint exchange programme dedicated to development of new tools for advanced pedagogical science in the field of ICT instruments, distance learning and intercultural competences in the EU, Australia, Ukraine and Russia. The programme will strengthen existing collaboration between EU partners, and 3 third country institutions of higher education through mutual secondments of researchers. A more detailed conception of the project is described in the Project application and on the project web-site (www.irnet.us.edu.pl)

The main objectives of the project are as follows:

1. **To evaluate teaching competences and to suggest effective strategies of implementing new innovative tools in the educational activity in the context of globalization of education.**

2. To explore indicators of educational effectiveness in the EU and third countries involved in the project.

3. To exchange experiences, analyse and evaluate teaching competences in the use of innovative forms of education and suggest effective strategies of implementing innovative ICT tools in the education activity.

4. To analyse and evaluate social, economic, law and ethics conditions, as well as methodologies and models of e-learning techniques being developed in the European and third countries involved into the project.

5. To evaluate the effectiveness of the existing models/methodologies designed to provide e-learning and enhance intercultural awareness.

6. To develop a new model based on the current existing models/methodologies and literature review.

7. To evaluate and present new models/methodologies for an effective remote collaborative work and improve information technologies in Education Science in EU and third countries.

8. To actively transfer knowledge with a view to generating strategic impacts in the thematic research area.

9. To promote scientific discussion about the integrity of systems of education and work focusing on competence issues in the context of globalization of higher education.

10. **Staff exchange between institutions in Europe** (the Czech Republic, the Netherlands, Poland, Slovakia, Spain, Portugal) **and third countries** (Ukraine, Russia and Australia).

11. **To strengthen existing collaborative research** (e-learning methodology, web 2.0, web 3.0 technology analyses, intercultural competences, teacher skills in school of the future, social, human, IT, psychological, methodical, ethical, law factors, influence on the development of some key competences) (IRNet Project Application, www.irnet.us.edu.pl).

2. SETTING OUT THE METHODOLOGY OF THE INVESTIGATION, DESCRIPTION OF THE PROCEDURES, DATA AND THEIR ANALYSIS, CONCLUSION ON THE STATE OF THE ICT AND E-LEARNING COMPETENCES AND INTERCULTURAL AWARENESS

2.1. Methods

Scientific research involves the selection of appropriate methods and practices in order to achieve a particular purpose, solve a research problem, and obtain the results of research. "The research method is understood to mean a set of theoretically justified conceptual and instrumental procedures covering generally all of the researcher's actions in the course of the attempt to solve a certain scientific problem" (Pilch 1995). The concept of research methods is directly related to the term research techniques. According to (Łobocki 2003) "... a research technique is always a particularized variety of research methods." It is used for carefully collecting suitable research material (Smyrnova-Trybulska et al 2014a).

The planned scientific activities are divided into **seven interconnected work packages** (http://www.irnet.us.edu.pl/documents) in order to structure the work planned, of which five are based on joint researches of all the partners, one is focused on the dissemination of results (WP7) and one WP is designed to project management (WP1). Each of Work Packages is designed to one of main research activities of the project and aims to develop a new conceptual and methodological approach in the thematic research area. These will be also a basis of long term research collaboration promoting knowledge transfer between EU and third countries.

2.2 Research instruments

To achieve the aims of the project the research group developed a questionnaire which is designed to gain data on the students' views and attitudes towards various

educational processes in their educational environments, entailing modes of ICT implementation, intercultural and professional competences.

A comparison of different factors of ICT and e-learning in several partner countries is carried out using *methods, research techniques and tools* compatible with the aims and tasks of WP2**.** Research methods are divided into *quantitative* and *qualitative* pedagogy.

I. Methods of pedagogical research:

   a. *Quantitative*: 1) pedagogical monograph (research papers), 2) method of individual cases, 3) method of diagnostic survey.

   b. *Qualitative*: 1) depth interview, 2) qualitative analysis of the text (documents), 3) observation.

II. Techniques of educational research:

   1) observation,

   2) interview,

   3) questionnaire,

   4) study and analysis of documents,

   5) content analysis.

III. The main research tools:

   1) interview questionnaire,

   2) questionnaire,

   3) survey,

   4) observation tools,

   5) *development of the subject dictionary*,

   6) research trip and visiting a partner university,

   7) meeting, (video)conference, seminar, workshop, etc.

Researchers will be expected to take part also in events, such as conferences, workshops and roundtables, particularly ones that deal specifically with their topic(s) of research, for example:

- Initial seminar in Poland in a remote form (using Adobe Connect technology for videoconferences) (held on 12 November 2013).
- Meeting for all project participants in Spain (held in March 2014).
- Videoconferences and roundtable debate once a month (scheduler of the project videoconferences available on http://www.irnet.us.edu.pl/news).
- Meeting and Workshop (HSPU, Russia) (held in April 2014).
- Conferences:

- International scientific-practical conference "High-tech information educational environment", April 15, 2014 at Herzen State Pedagogical University of Russia (held on 15 April 2014).
- International Scientific Conference DIVAI 2014 (Distance Learning in Applied Informatics) UKF (Slovak Republic), (~~was~~ held 5-7 May, 2014);
- International Scientific Conference "Innovations in higher education and dissemination of the initial results of the research on the law, ethical, human, technical, social factors of ICT developments, e-learning and intercultural developments in deferent countries" (DSTU, Ukraine), (was held 24-26 June, 2014), others.

The diagnostic research instrument of more than 60 questions was translated into students' native languages (Czech, English, Netherlands, Polish, Portuguese, Russian, Slovak, Spanish, Ukrainian) and presented in on-line versions by university survey system and by Google Drive.

The questionnaire covered the following topics:

1) Sociological data required for the purposes of the research (Country, Nationality, Sex, Age, Name of the university, Field of study, Specialization, Year of study, Level of studies (Bachelor's degree, Master's degree)

2) The group of questions, in the area of intercultural competences.

3) The group of questions, concerning ICT competences, using social media for extracurricular activities of students.

4) The survey questions which are reflective in nature, revealing students' opinions about the courses and their assessment in terms of substantive, methodological, technological, organizational aspects, and e-learning as a technology, method and a form of obtaining education.

2.3. Some research outcomes

The project seeks to use the synergies and complementarities of the 10 research teams to furnish a more accurate and holistic picture of the current state of universities. Each of these Work Packages is designed to produce specific outputs: workshops to discuss the results, a website, a working paper series to put the research results quickly into the public domain, and a book covering the scientific achievements. Overall, the work packages aim to widen an established research agenda and to develop a new conceptual and methodological approach. These will be the basis of a joint research application and long term research collaboration, which will assist in promoting and reflecting upon a knowledge transfer between EU and non-EU countries. (Kommers et al 2014). The Tables 1 and 3 shows a Comparison of legal factors of ICT and e-learning development in **The**

Netherlands, Poland, Ukraine, Russian Federation, Australia, Spain, Portugal, Czech Republic, Slovakia. The Tables 2 and 4 includes Comparison of legal factors at UT, US, BGKU, HSPU, CU, UEx, LU, UO, UKF universities participating in the project.

Table 1.

Comparison of legal factors of ICT and e-learning development in t**he Netherlands, Poland, Ukraine, Russian Federation and Australia**

ICT and e-learning in education				
The Netherlands	**Poland**	**Ukraine**	**Russian Federation**	**Australia**
The Dutch State University system is characterized by free entrance for each student who graduated from the secondary school, provided that the needed subject courses have been covered. The targeted competences are both academic and professional. Still the prescribed language for the bachelor stage is Dutch; Masters- and Ph.D. curricula are saturated with English at the moment.	Standards of education. Preparing for the teaching profession (Law on Higher Education, Act of 27 July 2005, Article 9c.)	National Qualifications Framework (Resolution of Cabinet of Ministers of Ukraine, 11 November 2011)	Decree of the Ministry of Education and Science of the Russian Federation dated 03.08.2012 № 583 "On monitoring the activities of federal government educational institutions of higher education" (http://www.edu.ru/db-mon/mo/Data/d_12/m583.html	In Australia, students are eligible to enter the universities based on their average and experience. Australian and International Students should pay fees for the bachelor and postgraduate degrees, Fees are waived for Australian students who will complete the Master of philosophy and a PhD. All the courses are taught in English. According to Australian Curriculum Assessment and Reporting Authority (2012) Digital technologies are available in higher education to enhance students' knowledge and skills to locate, manage, organise, analyse, represent and present information, and to collaborate, share and exchange information and support thinking and engagement.

Could distance learning be officially used as a legal learning and teaching form and teaching at high school? What are the conditions?

The Netherlands	**Poland**	**Ukraine**	**Russian Federation**	**Australia**
The use of media in Dutch Higher Education is encouraged as far as it contributes to flexibility and internationalisation. Step by step the ministry of higher education becomes aware that MOOCs are helpful to keep diversity in programs alive as not all specialties can be afforded by the limited number of universities staff members.	The number of hours in remote mode does not exceed 60 % of the total number of hours of classes. (Regulation of the Minister of Science and Higher Education of 9 May 2008)	Regulation of the Minister of Science and Higher Education of 30 April 2013 The Regulation defines the distance form similar to the remote form. The Regulation does not detail the time, which can be used by teachers of the University to conduct classes on-line. The Resolution (authorization) on the implementation of distance education, as a separate form of student training, can be granted to Universities can receive by the Ministry of Education and Science in respect of the structural units that are geographically distant from the head office of the University. The University is not allowed to freely choose and implement such learning. On July 1, 2014 Ministry of Education and Science allowed only 15 universities to implement distance education officially. All the other Universities have to conduct blended learning. Since 2013, to the indicators of the Universities rating conducted by Ministry of Education and Science and public organizations indicators have been added that are connected with the presence of University resources in the Internet – Webometrics indicators. Such indicators are an incentive for the Heads of Universities to implement distance learning and expand e-resources that are part of the electronic learning environment of the University	Federal law “About Education” The Law officially provides the possibility to use e-learning and distance learning technologies. Organizations engaged in educational activities are able to use e-learning and distance education technologies in the implementation of educational programs.	The Australian universities are using various teaching modes i.e. F2F, Online, MOOC and Distributed, to coverage anytime, anywhere, any device and to match student and employer satisfaction. Curtin University is using the above modes to facilitate learning experiences for students.

Table 2

Comparison of legal factors at UT, US, BGKU, HSPU, CU universities participating in the project

University of Twente in Enschede	University of Silesia in Katowice	Borys Grinchenko Kyiv University	HSPU	Curtin University
The University of Twente has adopted the potential of MOOCs in a way that stimulates the further evolution of mediated learning, both on- and off-campus. Its goal is growing quality awareness at the level of teachers and curricular designers.	Decree No. 66/2012 formally allows one to teach up to 60% of classes in the remote mode. Proper operation of university distance learning platforms and their availability is coordinated by the Director of the Distance Learning Center (DLC) at the University of Silesia. A prerequisite for an academic teacher of distance-mode classes is to undergo special training, organized by the DLC at the University of Silesia (5 hours for lecture and 20 hours for authors). Dean may exempt an academic teacher who has experience in the methods and techniques of distance education from the educational training. Field activities, workshops and laboratories are not carried out in the . An academic teacher can teach classes in the distance mode during the academic year for no more than 50% of the hours of their normal working hours.(Degree No 66)	Approval of the Regulation on e-learning courses in LMS Moodle, and special requirements for e-learning courses certification, 2012 The concept of e-dean in LMS Moodle and its use in the educational process of the University, № 329 \ 2013 Regulations on the DL at the University, 2014 Regulations on the use of DT in a part-time form of study, according to which in the intersession period (80% of teaching time) LMS Moodle, containing certified e-learning courses for students is mandatory to be used, 2014	Development and implementation o primary and secondary distance education program (Development program 2012-2015)	Curtin University has adopted MOOC courses, and the first course attracts more than 1500 students. MOOC mode aims to deliver the materials online to anyone in the world, and to raise awareness, quality, skills and knowledge among the students.
Quite recently the board of governors at the university of	Increase in the number of e-learning courses, and greater	Approval of th Regulation o professional development of teacher	Development of electronic educational	Curtin University developed so

Twente has expressed explicit interest to undertake MOOCs as a format for implementing fields of excellence. One of the challenges is to integrate social (pseudo) presence, constructivism, problem-based learning and social media. Prior to these mechanisms, there is a need to allow students to prove competence through unique, authentic learning achievements like design and societal problem solving, rather than just checking if the curricular components are mastered.	activity in distance teaching. Organisation of lifelong learning courses and training – also in the form of e-learning in Polish and English – in the use of electronic databases for students, doctoral candidates and employees. Using and developing modern computer and information technologies for more individualised education in the form of e-learning and blended learning (Development Strategy 2012-2020). Development, launch and organization of in-service training courses in distance learning and fundamentals of *Moodle* for academic teachers and students by Distance Learning Centre (DLC) (Development Strategy 2012-2020).	by the creation of e learning courses a compulsory for al teachers, availability o an electronic course as necessary condition fo receiving the title o associate professor an professor. Increase in the numbe of e-learning courses Using and developing information technologies for mor individualised educatio in the form of e-learning and blended learning (Development Strateg 2013-2018). Decree on th Experiment of usin mixed type of educatio in teaching master programmes, 2013 Decree on the mandatory use of ELC in teaching correspondence department students, 2014 Order on analysis of Webometrics ranking indicators for all University Institutes and incorporating them into domestic university rankings, 2013 Approval of a corporate standard of Master's ICT competence, 2014 Approval of a corporate standard of university teacher's ICT competence, 2014	resources aimed at remote support for various categories of students (pupils, students, students, professors, teachers, people with disabilities), including in foreign languages. Teachers' training in implementation of remote support for students with the use of electronic educational resources (Development program 2012–2015)	far, three MOOCs, and implemented two of these in 2013. As well as, Curtin is building a world-leading group of online courses through Curtin Online and Open Universities Australia. Currently, Curtin is using the Innovation Studio, which is a collaborative workspace, to assist in teaching and learning needs and achieve students' needs.

Table 3.

Comparison of legal factors of ICT and e-learning development in **Spain, Portugal, the Czech Republic, Slovakia**

ICT and e-learning in education			
Spain	**Portugal**	**Czech Republic**	**Slovakia**
Law of Universities. Organic Law 6/2001. BOE 24-12-2001 (http://www.boe.es/boe/dias/2001/12/24/pdfs/A49400-49425.pdf). Law that modifies the Law of Universities: Organic Law 4-2007. BOE	Education System Base Law (Law 46/86, modified by the Law 115/97)	Act no. 111/1998 coll. (amended and consolidated) On higher education institutions And on amendments and supplements to some other acts (the higher education act)	Law. No. 131/2002 on higher education institutions, Last changes 1.1.2014; Law. No. 455/2012 , which modifies

13-4-2007 (http://www.boe.es/boe/dias/2007/04/13/pdfs/A16241-16260.pdf).			the law no. 131/2002 On higher education institutions and on the amendment to some other acts.
It is not officially regulated. Options: 1. Officials Titles of the Ministry of Education are regulated by the National Agency for Quality Assessment and Accreditation (ANECA). 2. Officials Titles of the each University are regulated by the Council of Government of University.	In the Article 16th c), of the 46/86 law the distance learning is considered as a special yet valid method for learning Article 21st of the same law is specific for distance learning and it states on its point number 3 that the open University is part of distance learning	Section 44, ACT NO. 111/1998 Coll. states that „A higher education is earned through studies within the framework of an accredited degree programme offered in line with the curriculum for the given mode of studies.“ **Distance mode of study and combination of full-time and distance mode** All study programmes must be backed up by study support in all the courses taught in the distance mode. Study support consists of a set of information which substitutes direct teaching. It cannot be an excerpt from a textbook or another reduced text. Study support must include tasks for student's individual work, rules for communication with the tutor etc.	

Source: Own research, 2014

Table 4.

Comparison of legal factors at universities UEx, LU, UO, UKF participating in the project

University of Extremadura, Spain	Lusiada Lisbon University, Portugal	University of Ostrava, Czech Republic	Constantine the Philosopher University in Nitra, Slovakia
It is not officially regulated. Each educational project, face to face, e-learning or b-learning, can have various modalities and configurations. It must be approved by the Council of Government of University	Law 46/86 allows open University to use distance learning. We are implementing a way to use distance tools to teach our students in partner countries such as Angola or Cape Verde	The University of Ostrava has the „Internal Accreditation Commission“ that considers whether the accreditation applications of study programmes respect the Accreditation Commission Standards.	The Law 131/2002 defines the study forms and methods. The distance and blended form recommends replacing the direct communications between teachers and students by information and communication technologies.
	Increase of using e-learning platforms such as Moodle platform for	Approximately 50% of regular students studies using the	Distance learning using e-learning is not widely used, LMS is used on the

	general contents and DSpace for multimedia contents. Virtualization of the Academic procedures allowing that great part of the information can be consulted either by internet or by mobile platforms (smartphones, tablets, and so on). Teachers are being impelled to acquire digital competences to deal with the teaching media of the future.	combined form of study, at The Pedagogical Faculty, University of Ostrava. The students use study support, internet and tutorials that are provided once a week (6 – 7 hours) each semester.	voluntary basis to support the present and distance form of study. ICT technologies are extensively used for the organisation of independent work of students and knowledge control. The managerial and technical aspects of the e-learning implementation at UKF are defined in the internal directive 14/2007.

Source: Own research, 2014

The above tables include a Comparison of legal factors of ICT and e-learning development in the different partner countries from West, Central, East European and Australia, and show shared identical, similar, overlapping data and differences in state policies and university regulations in different project partners. For example in the West European universities the potential of MOOCs is adopted in a such way that stimulates the further use of other ICT tools and e-learning for flexible learning and teaching and for internationalisation of education. In the Central European universities and in Australia blended learning is implemented on the basis of the Regulation of the Minister of Science and Higher Education, for example in Poland the number of hours in the remote mode does not exceed 60 % of the total number of hours of classes. In Russia and Ukraine also a Regulation of the Minister of Science and Higher Education has been issued which defines the distance form similar to the remote form. Simultaneously, the Regulation does not specify the time, which can be used by teachers of the University to conduct classes on-line. One of the aims of this WorkPackages research was to analyse legal, ethical, human, techniques, social factors of the development of ICT, e-learning and intercultural development in every partner countries by studying government as well as university documents, resolutions, etc. The researchers took part in events, such as conferences, workshops and roundtables.Through this activity the partners and researchers could be involved in collective research, an exchange of results of study as well as previous experience and development of suggestions on the factors which contribute to the higher/lower level of the examined competences and possible solutions to improve the situation at the national level.

It can be observed that due to the extensive use of technology in the practice of e-learning in Russia, more and more legislative activities are being undertaken in order to ensure a flexible legal framework for the implementation of these technologies in the educational institutions of different levels. The main prerequisites for organizing this type educational interaction are determined by the Federal Law About

Education (2012), the concept of a unified information educational environment in Russia (2013), and the Order of Ministry of Education and Science, which prescribes the manner in which e-learning and distance learning technologies should be used (2014).

At the same time, these regulations contain a number of contradictions and insufficiently developed items that need to be complemented by regulatory enactments at the university level. In particular, it concerns the distribution of classroom and distance learning classes. For optimal organization of the educational process with the use of e-learning technologies the experience of universities that participate in the project is relevant and useful for Russia. Consequently, all the universities are deeply involved in e-learning. It depends on the university educational policy. However, students are accustomed to submitting their results by electronic methods and consider such a way quite effective.

The results obtained during the survey of students' questionnaire prove close relationship and mutual influence of classroom and extracurricular interactions in the virtual learning environment. The virtual learning environment is effective when it reflects students' interests and demands: educational information, suggestions for work, invitations to participate in events (conference, contests), photo galleries and reports on past events, resources for distant learning and other educational resources (Noskova et al).

3. SUGGESTIONS ON THE FACTORS WHICH CONTRIBUTE TO THE HIGHER/LOWER LEVEL OF THE EXAMINED COMPETENCES AND POSSIBLE SOLUTIONS TO IMPROVE THE SITUATION AT THE NATIONAL LEVEL

The next stage of the project research is implementation od the WorkPackage 3 (Coordunator prof. Tatiana Noskova, HSPU). One of the most important aims of this WP3 is: to analyze methodological background and main approaches of conducting international investigations on ICT, e-learning and intercultural competences in order to work out a system of measuring instruments appropriate for the research at the international level.

3.1. WP3: Analyses and evaluation of the ICT level, e-learning and intercultural competences development in every participating countries

3.1.1. Objectives

• To analyse and evaluate the level of ICT, e-learning and intercultural developments in every participating country applying the system of measuring instruments approved

• To compare the results obtained and to draw the conclusion about barriers in ICT, e-learning and intercultural competences, taking into consideration descriptions

of the national specifics of law, human, social, ethical and technological factors of their implementation drawn at the previous WP.

Analyses and evaluation of the ICT level, e-learning and intercultural competences development in every participating countries.

3.1.2. Description of work

On terms of mutual research and under the supervision of the US (Poland), partners from UT (The Netherlands), UEx (Spain), UKF (Slovak Republic), CU (Australia), BGKU (Ukraine), DSTU (Ukraine), HSPU (Russia), OU (Czech Republic), LU (Portugal) will be engaged in a critical review of the existing methodological literature, learning of the experiences in cross-cultural evaluation at the international level, study of the measuring instruments.

Task 3.1: The main task of WP is to develop a system of instruments which will be appropriate for application in every country participating in the project, and will allow to obtain reliable and comparable data about ICT development, e-learning, teachers' and students' practices and attitudes towards ICT in their learning and professional life as well as their intercultural awareness. Investigation embraces domestic and foreign experience in the field of distance learning and the use of remote forms of education and IT technologies in preparing contemporary specialists, in particular future teachers. It includes identification and theoretical justification of the basic principles, forms, methods of effective use of ICT and remote forms of teaching in the educational process in higher education institutions.

Task 3.2: Comparison of the data obtained with the information elicited and generalized at the previous stage about the legal, ethical, human, technological and social factors that will help to discriminate factors influencing ICT and e-learning competences and intercultural awareness. Instruments supposed to be implemented are interviews of students, teachers and administrations of the institutions, observation over the learning practices, analysis of teaching and learning downloads and teaching materials, courses and their curricula, testing of students' learning outcomes, etc.

Task 3.3: The number of participants in the research will be stated according to the demand to obtain objective and profound information of ICT development, e-learning and intercultural competence in every participating country. The data are going to be analyzed by the statistical methods proving their significance, reliability and objectivity.

Task 3.4: Researchers will be expected to take part in events, such as conferences, workshops and roundtables, particularly ones that deal with their topic(s) of research: *ICTE-2014 at OU (*Czech Republic*)* (*presence and remote participation, separately financing, for example, statutory research, Erasmus, University, Departments funds).*

Task 3.5: Conference *Education of children and youth in culturally diverse environments 2014 at the US* (Poland), Conference *Theoretical and Practical Aspects of Distance Learning 2014 (Subtitle: E-learning and Intercultural Developments in Different Countries) and Workshop at the US (*Poland*).*

Task 3.6: Meeting in Australia (in presence and remote form),

Task 3.7: Workshop and e-round table debate in LU (Portugal),

Task 3.8: Meeting and workshop in UT (Netherlands),

Task 3.9: International Scientific Conference *"New educational strategies in contemporary digital environment"* (HSPU, Russia*)*

3.1.3. Deliverables

D 3.1. Month: 9 - 4 scientific papers, published in the *ICTE 2014 Conference proceeding*

D 3.2. Month: 10 - Discussion and e-round table debate *Analyses and Evaluation of the ICT and E-learning and intercultural competences in Australia, Czech Republic, Netherlands, Poland, Portugal Russia, Slovak Republic, Spain and Ukraine during presence meeting and on-line videoconference*, conducted by CU.

D 3.3. Month: 10 - Monograph *Education of children and youth in culturally diverse environments*

D 3.4. Month: 11 - Scientific working paper on *Contrastive Analyses and Evaluation of the ICT and e-learning and intercultural competences in Australia, Czech Republic, Netherlands, Poland, Portugal, Russia, Slovak Republic, Spain and Ukraine setting out the methodology of the investigation, description* of the procedures, data and their analysis, conclusion on the state of the ICT and e-learning competences and intercultural awareness, suggestions on the factors which contribute to the higher/lower level of the examined competences and possible solutions to improve the situation at the national level.

D 3.5. Month: 12 - Monograph *E-learning and Intercultural Developments in Different Countries*

D 3.6. Month: 16 - Scientific paper titled *New Educational Strategies in Contemporary Digital Environment, prepared for publish in Scientific International Journal IJCEELL (published during 3 months* after sending to the Journal)

D 3.7. Month: 16 - 2 Scientific papers, prepared to publish in Scientific International Journal IJWBC (published during 3 month after sending to the Journal) (IRNet project Application, www.irnet.us.edu.pl)

CONCLUSION

It is expected that further partnership's contribution to the area of collaboration will be as follows: A dataset for the analysis of the level of development of ICT, e-learning, intercultural competences in different EU countries; A literature and IT tools review and analysis of its place and level in European educational system and in the countries – project partners. The arrangements of different types of temporary work contracts as implemented in each of the EU countries under consideration will be studied; A detailed ICT and intercultural competences developing methodology for the evaluation of the network research effect in educational institutions of different EU countries; A deepening of the classification of different welfare state regimes, assessing their effectiveness to represent different educational institutions. This result will be achieved by means also of cluster analysis of the systems based on different methodologies and variables; A detailed identikit of teacher in each of the six countries mentioned elsewhere in this project as an expression of a given welfare and educational regime; Country studies aimed at assessing the network research effect in each country considered. The final stage of elaboration of these studies will consist of submitting them to international journals; implementation of methodologies; A cross-country study of the network research effect; Education suggestions on the issues studied in the project.

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IS WEB DEVELOPMENT PROCESS TEACHING AND TRAINING ESSENTIAL FOR SMALL ONLINE BUSINESSES IN WESTERN AUSTRALIA

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Abstract: *This paper provides an answer to the question "is a web development process is essential to Small Online Businesses (SOB) in Western Australia". This answer came through employment of online survey (N=127) SOBs that allowed the collection of both quantitative and qualitative data. Descriptive analysis was conducted with an indication that 71% of respondents are interested in attending subsidized/low cost training to improve the layout and navigation of their website. This is of importance, especially as the internet has become a primary medium for accessing information for businesses. This paper concludes with series of recommendations calling for the facilitation to allow SOBs attend free teaching and training at the university level which will allow greater awareness to web development process between users/designers.*

Keywords: Web Development Process, Small Online Business, Teaching, Training Course, University level

INTRODUCTION

The internet has changed users, and businesses experience in communication, interaction, collaboration as this technology becomes essential tool to assist them complete their tasks far more efficiently. These massive groups of users/ businesses reach the Internet through their computers and terminals via educational institutions, commercial Internet access providers and other organizations. This platform provides numerous benefits to consumers in relation to access to information, entertainment, research, business and marketing. Indeed, it allows "consumers to educate themselves about the information or products at their own pace, and consumers can instantly access only that information which is pertinent to their needs" (Issa 1999: 11, Issa 2008). Dou, Nielsen and Tan suggest that the internet

"provide(s) a low-cost [gateway]" to the global market for companies intending to or engaging in exporting, especially for small-to-medium enterprises located in peripheral economies and those operating in universal niche markets" (2002: 105). While Meng (2010: 547) defines internet marketing as "… the strategy that the agency or organization uses the modern communication technical methods to exchange the potential market as the reality market". Therefore, to be a successful online marketer, the basics of the marketing process should be established first, which are, "needs assessment, market research, product development, pricing, distribution, advertising, public relations, promotions and sales" (Janal 1995: 22). Today, suppliers have the capability to deal interactively with consumers at any time of the day or night in their home or office. The buyers can interact with their suppliers in two-way, not one-way, communication. It is obvious now that there are various advantages to businesses in using online retailing such as "quick access to the information, capturing a global audience 24 hours a day, seven days a week. Lately, the longer working day is driving customers away from queues at shopping malls and turning them to the convenience of the Internet" (Lindstrom 1999). Additionally, according to Baier (2010: 173) using the electronic channels will reduce the potential "for the seller to demonstrate the solidity and the capabilities of the products and the sales organizations, trust and content play an important role in the shoppers' selection and buying process." Internet marketing opportunities can be "neatly divided into two areas: products and services" (Segal 1998). The usefulness of the Internet depends directly on the products or services of each business. There are different benefits depending upon the type of business, as to whether the user is a supplier, a distributor or a retailer. The Internet is rapidly becoming an active marketplace for buyers and sellers for a fast-growing pool of consumer goods and services. Though still a small slice of the total shopping pie, the World Wide Web, in just a few years has become an important outlet for manufacturers and retailers of everything from information, clothes, food and books to computer toys and travel arrangements. Online ordering is also becoming increasingly common. Often this involves an initial setting up of an account for an individual by providing a credit card number or other sensitive information by completing an on-line form or using social network facilities, or through other traditional modes.

With the internet, businesses can become more efficient and able to produce higher-quality products, improving the commercial market for consumers. Internet marketing provides faster and more up-to-date information than traditional search techniques, allowing businesses to find essential information to integrate into their products more effectively. It is a magnificent research tool and communications device. By searching through databases and discussion groups, businesses can find information on their competitors, generate new-product ideas, solicit the opinions of consumers, and learn new approaches to the way they conduct their business. However, successful Internet marketing still relies on "many of the same basic principles that apply to any marketing efforts: knowledge, reputation, customer services and consistent image" (Franklin 1996, S2). Furthermore, Internet marketing also improves customer relations as businesses can interact more closely

with the public and understand their needs. By using Internet resources, businesses can make larger quantities of information available to the public than by using traditional marketing media. By posting important information about their products, businesses allowing consumers education process with regards to their products at their own pace. Consumers can easily access web pages with lists of commonly asked questions and answers when they have difficulties with products. They can instantly access only that information which is pertinent to their needs. Consumers can shop from the privacy of their own homes 24 hours per day without the interference of sales people. By using the Internet in the business sector, two important outcomes can be achieved: a) time and money can be saved, increasing business profit; and b) increasing consumer satisfaction. Since this media spans many countries throughout the world, companies are able to achieve an international presence for their products and services at low cost. Additionally, the Internet presence might provide equal opportunity for businesses to sell their products, and the companies with higher-quality products, better customer service and better web presence will succeed. The effects of commercial Internet use will benefit both businesses and consumers and change the marketing techniques of the future. The "Internet has become a major component of the marketing strategy and operations of businesses" (Kalaignanam, Kushwaha et al. 2008: 300). Although Websites have great power for marketing and spreading the good word about a business, it also has the power to damage a business's reputation. The key is the effective design of websites; however, currently users are not very satisfied with website design, especially the SOB's websites, with regards to navigation, usability, human-computer interaction, user participation and color. To prevent such problems among SOB, this paper aims to examine whether training SOBs in this field is significant to develop a successful website in Western Australia. This is especially important as earlier research conducted by one of the co-authors indicates that Australian websites were missing the essential aspects to develop a successful website to attract more users to visit them. This paper outcome though limited but adds a valuable methodological, theoretical and practical significance to the current website development process literature. This paper provides background and context, research methodology and questions, results and discussion, future research and conclusion.

WEB DEVELOPMENT PROCESS AND CONTEXT

To develop a successful website, designers and users must understand the basic aspects for developing websites, i.e. Usability, Human Computer Interaction (HCI), Participation, Color and Training. Under this section, the researchers will provide a small introduction regarding the importance of aspects in a web development process to satisfy users' needs and increase their satisfaction, as Lee and Kozar (2012) found that current websites still contain a number of usability problems, such as understanding and navigation difficulty, format inconsistency, and lack of interaction and reliability. Usability refers to the "the capability in human functional

terms to be used easily and effectively by the specified range of users, given specified training and user support, to fulfill the specified range of tasks, within the specified range of environmental scenarios" (Shackel 2009: 340). Alternatively, a new study by Alonso-Rios et al. (2010: 53) indicated that concept of usability derives from the term user friendly, defined as "an expression used to describe computer systems, which are designed to be simple to use by untrained users, by self-explanatory or self-evident interaction between user and computer." Additionally, Nielsen (2003) defines Usability as "a quality attribute that assesses how easy user interfaces are to use. The word "usability" also refers to methods for improving ease-of-use during the design process." The usability evaluation stage is an effective method by which a software-development team can establish the positive and negative aspects of its prototype releases, and make the required changes before the system is delivered to the target users. Usability evaluation is about observing users to "see what can be improved, what new products can be developed" (McGovern 2003). It is "based on human psychology and user research" (Rhodes 2000). HCI specialists "observe and talk with participants as they try to accomplish true-to-life tasks on a site (or system), and this allows them to form a detailed picture of the site as experienced by the user" (Carroll 2004).

Human-Computer Interaction (HCI) was adopted in the mid-1980s as a means of describing this new field of study. Preece et al. (1994) indicated that this term is mainly focused on the interaction between users and computers. HCI "is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them" (Preece et al. 1994; 7). Therefore, the reasons for studying HCI in the development process are to create interactive computer systems that are usable and practical as well (Head 1999). The term HCI relates to several stages in the development process, including the design, implementation and evaluation of interactive systems, in the "context of the user's task and work" (Dix, Finlay et al. 2004: 4). The implementation of HCI can be perceived as an art as well as a science because it requires a comprehensive range of skills, including an understanding of the user, an appreciation of software engineering capabilities and application of appropriate graphical interfaces. "If we are to be recognized as developers with professional capabilities, as competent practitioners, then it is critical to understand what makes an application interactive, instructional and effective"(Sims 1997). HCI "is concerned with the design of computer systems that are safe, efficient, easy and enjoyable to use as well as functional" (Preece, Rogers et al. 1993: 11). Vora (1998) describes a framework, which provides for effective HCI for websites, with the main task being to have a clear understanding of user needs: who the users are, and what their tasks and environments are. Additionally, HCI is "concerned not only with how present input and output technologies affect interaction, but also with the consequences of new techniques such as speech recognition and generation (input and output)" (Booth 1989: 5).

Participation is "A process in which two or more parties influences each other in making plans, policies or decisions; it is restricted to decisions that have future effects on all those making the decisions or on those represented by them" (Mumford 1995: 12). User participation in the development process can be defined as the "extent to which the user engages in systems analysis activities such as project definition and logical design decisions" (Doll and Torkzadeh 1989:1155), and to determine "information requirements by encouraging users and other to indicate what they do and what information they need to do it" (Hepworth, Vidgen et al. 1992:122). Furthermore, user participation is defined as the "behaviors, assignments, and activities that users or their representatives perform during the information system development" (Hartwick and Barki 1994: 441). A high level of user participation is likely to enhance user "ownership" of, and identification with, the resulting system – in this sense "'user involvement' refers to the set of all such user's subjective attitudes toward, or psychological identifications with, information systems and their development" (Kappelman 1995:70). Research has shown that user participation in system design will greatly assist in producing a successful system. It results in less time in the implementation and testing stages as users are more knowledgeable about the system. Research and experience have shown that to run a successful application development process without any frustrations and dissatisfaction, the designer needs to involve the users and set clear objectives. This will help the designer incorporate the views of users in all the following development methodology stages: planning, design, implementation and testing.

Color in the web development process is very significant in the success or failure of a website. Until now, the designer mistreatment of using the color element by choosing the color based on their personally rather on scientific evidence (Holtze 2006). This will influence user visit to these websites in respect to the style, layout, structure, navigation, usability, speed, and how satisfied with the whole website design. Furthermore, Shneiderman and Plaisant (2010) posited that designers should limit the number and amount of colors, and choosing the color which matches the website contents and audience. Moreover, Te'eni et al. (2007) confirmed that color should be used to assist users to understand and evoke information in reading and decision making, and helping them to detect and recognize information. In addition, Color in consumer-oriented websites that match the social and emotional perceptions of users are expected to "increase trust and be more engaging, also increase user enjoyment or loyalty" (Cyr, Head et al. 2010: .2). Training is an essential aspect in the web development process, since training will give the users the necessary training which is required to develop and using a website (Issa 2008). Furthermore, Gerjets and Hellenthal-Schorr (2008) explained that web training for users is fundamental since it taught them to distinguish problems within their website and assist them to develop new strategies for solving the problems in their website, i.e. usability, navigation, layout, structure, text, and color. In addition, training should consider, besides the above, accessibility, globalization, readability and cultural difference issues (Al-Badi and Mayhew 2010). Currently, users are

becoming very sophisticated in the ways they can access information online from anywhere and any device. Therefore, web designers should adopt best-practice methodology (ies) to ensure the web design is meeting user requirements, since the majority of websites globally and locally are designed in the way to decrease user frustration in respect to the navigation, usability, Human Computer Interaction, User participation and color. However, there are still some websites, which are missing the essential desires for designing websites successfully. Consequently, training businesses and users, especially SOB is critical for website development process as users can gain knowledge of the methods which are required to develop and design an efficient website which meets customer's requirements and gaining new technology to support and maintain their website by themselves to reduce maintenance and cost aspects.

RESEARCH QUESTION AND METHOD

This paper investigates the question "Is training SOB for Web development process is necessary for their organization and enterprises," as websites become a mandatory for SOB to promote their business and satisfy their users. For this paper, an on-line survey method was used to collect data from 127 small on-line businesses in Western Australia. The purpose of using this approach lies in the fact that: (1) to assess whether training users is significant in the web development process, especially in Western Australia, (2) to assess whether training sessions will assist their online business to become more fruitful and successful, and (3) to attract more users to their websites. Similar to any other methodology, adopting an on line survey for this research has its strengths and weaknesses; as for the strengths, "the survey offers greater anonymity; less expensive; respondents can take more time to respond at [their] convenience; I can be administered electronically, if desired" (Cavana, Delahaye et al. 2001: 245). As for this method's weaknesses, these can be summarized as: "response rate is almost always low; 30 per cent rate is quite acceptable; follow-up procedures for non-responses are necessary" (Cavana et al 2001: 245). Furthermore, Van Selm and Jankowski (2006) indicated that on-line survey can recruit potential respondents with special interests and experience, especially Gen Y, who depends mainly on computer for communication. McBurney and White (2007) and Dillman (2007) indicated that on-line survey can be accessed from anywhere and anytime, easy to manage, inexpensive and practical, has a high response rate and finally, provide more dynamic interaction between respondent and questionnaire more than using email or paper surveys. Finally, online survey can compound multiple-choice questions, scales, open-ended questions, and single, multiple response questions (Evans and Mathur 2005).

RESULTS AND DISCUSSION

The survey was composed of eight questions. Five were seeking responses with simply two options “yes” and “no”, while the last two questions were designed to provide multiple choices for respondents to choose from with the last question being open-ended question. The survey response rate was 83%. Respondents provided interesting and rather valuable comments in respect to their training needs in this regard. The training program suggested in this online survey is called “Development and delivery of a training program 'B-Web Connected: connecting consumers to small businesses”, and is intended to cover the internet technology; electronic business concepts; user centered design process; evaluation and testing; navigation and prototyping: awareness of internet security and legal issues; usability; HCI principles and guidelines; task analysis; HCI development in system development life cycle; Color; Web 2.0, Web 3.0. In addition, this training intends to provide participants, depending on the level of their experience, with the necessary tools to either design a new website prototype or to enhance their existing one incorporating the latest research on style, structure and functionality that will attract consumers to their business. This training will be followed by a one-hour phone or email coaching session for each participant to finalize their website design bringing it to the prototype stage. The three-day training program will be of 18-hour duration and delivered twice in 2013 and twice in 2014. The training program will be delivered in a highly experiential manner using adult learning methodologies. The anticipation output will be a complete website design prototype that is customized to their consumer need which will be ready for a professional web developer to enhance. A prosperous website must first be capable to attract customers to it; and upon reaching the site, the customers must feel comfortable with the aesthetic appearance of the website and be able to find relevant and useful information with ease. Successful marketing on the Web relies on careful use of appropriate methodologies to create an effective and efficient website, to maximize ROI with expenditure of minimum time and capital. The survey results (Table 1) indicate that, while 39% were not satisfied with the appearance and structure of their businesses’ websites, and expressed the need to act towards improving these websites, 58% were satisfied stating they have witnessed improvement in the effectiveness of their business in the presence of their website.

Table 1.

Online Small Businesses -Western Australia (Prepared by the Authors)

Survey questions with the options of 'Yes' and 'No'	Yes	No
Do you have a website?	72%	27%
If you answered No to question 1, do you plan to develop a website within the next two years?	29%	8%
If you answered yes to question 1, are you satisfied with the appearance and structure of your website?	35%	39%
Do you think your website has improved business performance	58%	11%
Would you be interested in attending subsidized/low cost training to improve the layout and navigation of your website?	71%	22%

These results, echo the results of another survey but of a larger sample (i.e. 1,500), conducted by Sensi's e-Business Report (August 2009: 23). Indeed, the general feeling amongst this sample (large 'Sensi' and small 'this paper') indicate that having a website had improved their business performance, which indicates that having a website in this age and time is a positive issue that reflects positively on businesses. In our survey respondents spoke of their interest in learning about *"…trips and traps for 'young' website designers – how to avoid the obvious mistakes in order to create a useful website that is not just fancy," "Be able to bring the control of our web site in the house rather than relying on an external company," "Learn how to write a website planning document to give to a web development company, so they build something that will work for my business," "To save ongoing costs currently being paid to a designer to maintain the site," "It would give us an understanding of the difficulties and procedures of establishing and maintaining a website." "Gaining advanced knowledge and becoming more self-sufficient in terms of updating and maintaining a company website. Being 100% dependent of 3rd parties can sometimes be an uncomfortable situation to be in."* The designers would largely focus on the technical aspects of the project and do not pay sufficient attention to the users' expectations and requirements. In this respect, the Sensis e-Business Report (August 2009: 31) indicated that *"the largest concern small businesses identified relative to medium businesses involved a perceived lack of expertise and knowledge of computers. Overall, 21 per cent of small businesses identified this issue as a major concern."* This feeling was also reflected in the survey with comments such as *"understand the language to speak to a web developer / we are at the mercy of web designers / optimal for my requirements / get it right the first time / best understanding tech speaks / control on the design and use / Work out if a web site really helps our business with. Marketing, best understanding tech speaks, gain marketing insight, gain graphic skills, gets help to*

build a web site that I can easily alter if "hits" are not resulting in enquires or sales."

Some designers try to mimic successful sites by copying attractive images from other websites and thus create a home page without a basic knowledge of design principles. Apart from the obvious business risks associated with copyright infringement, websites such as this lack unity as the graphics and text are written and created by different writers and designers. A website that is designed reflecting the business, its owner and customers will better reflect its personality and offer a far more coherent picture of the business. As Sheridan (1999) noted, with each generation consumer are "becoming more sophisticated, and as they do so, their expectations and behaviors are changing; do not get caught designing for yesterday's audience - stay on the cutting edge with this kind of research so that you can design for tomorrow's audience!" This is not just about aesthetics, but also about effectiveness. Other issues of customer frustration include problems related to navigation, interactivity and downloading. A poorly designed interface may have a negative impact on customers' confidence with both the site and their trust in the business. To create an effective website, designers need to ensure that the requirements of the customers are met so that they are encouraged to explore and re-visit the website. While Hoekstra (2000) advocated that proprietors that create their own site with a passion may include something of themselves, they still require a structured and methodical approach to create a successful, productive and sustainable website.

The substantial difference in our proposed course is that it involves a participative design process. The small business proprietor will be asked to survey their customers prior to attending the course, to ensure the website design is focused on the requirements of the target audience. Based on the interview data collected from the first author's PhD research, many businesses favored a customer-centered approach. This includes actively seeking customers to provide feedback and information on what they would find valuable when they visit the website and to extend this further by including some of the latest Web 2.0 tools to understand who their customers are, the technology that they use and their social context since technology is rapidly changed. As most of the respondents in our survey designated that "The technology has changed drastically, and I would be interested in find out the best solution to meet OUR needs. The site must also be accessible to non-Microsoft software users." Small businesses need to understand the preferences of different generations of customers ranging from the Silent Generation to Baby Boomers to Gen X, to new generations of Gen Y and Gen Z; all generations need to be engaged for business sustainability. As most of the respondents in our survey indicated that, a great website will be a "…total necessities in the future…" *"Better 'visibility' on the web and greater ease of communicating company information to prospective clients."* While some visitors to sites require informational content and some prefer interactivity, all want some degree of flexibility, usefulness and ease in the usability aspects of the site.

From the survey outcomes, it was noticed that training users is an essential and crucial step for SOBs since most participants indicated that training will expand their knowledge *"of what can be achieved outside the box"*; to improve *"the stickiness of [their] our websites and improve [their] own website appearance and make it easy to use";* to develop *"clear marketing focus and implement through the web";* enhance *"the visibility of our business"* and finally, *"finding out the do's and don'ts when it comes to web design/web marketing, and finding out about search engine- optimization and how best to utilize it."* Furthermore, most participants contended that completing a training session at a university level will assist their organization on two fronts: (1) saving and improving their financial status, and (2) the in-house improvement of their websites. Based on the above and the strong demand (i.e. 71%) of respondents from Online Small Businesses are interested in attending subsidized/low cost training to improve the layout and navigation of their website, it is crucial that training is conducted. This training program seeks to develop, deliver and evaluate a more effective, participative methodology for developing small business websites. The program will be customized to SOB and will provide the techniques and tools required to develop an effective, efficient, easy to use and up to date website, including the utilization of Web 2.0 and Web 3.0 tools. As indicated, SOB will be asked to collect information from their customers, by way of a survey designed for them by the researchers, in order to develop a prototype for their website. SOB will also be provided with ample opportunity to reflect on who their current customers are, and to identify like target groups for the future. The outcome of the program will be a website design and plan for implementation, roll-out, required resources and on-going maintenance.

CONCLUSION

This paper examined the importance of teaching and training users for SOBs in Western Australia, presenting the findings of data collected from 127 SOB. These findings highlighted the fact that teaching and training is essential for them as through the three-day teaching and training program SOB participants anticipating that such intensive and short-term training would assist them to learn the fundamental and advanced knowledge and skills in web design. It is projected that the teaching and training program will be delivered using adult learning methodologies and be highly experiential. It was also noticed that there is a massive demand for this training program as most of the respondents demonstrated that this training program will help them to develop clear marketing focus and implement this through the web, understanding the language to speak to web developer and website cost. Therefore, the three-day teaching and training program will be of 18-hour duration and delivered twice in 2013 and twice in 2014, and the outcome of the program will be a website design (High-Prototype) and plan for implementation, roll-out, required resources and on-going maintenance.

ACKNOWLEDGMENTS

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INTERCULTURAL ASPECTS OF HIGHER EDUCATION IN DSTU (UKRAINE)

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Abstract: *This paper is prepared by a research team from Dniprodzerzhinsk State Technical University and it focuses on the objectives of the international project IRNet - International Research Network for the study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences. The presented paper shows first outcomes of WP2 of the project, devoted mainly to the state of intercultural competences in Ukraine.*

Keywords: intercultural competence, communicative competence, linguistic competence, motivation

INTRODUCTION

At the present stage of development of the Ukrainian society it is evident that the rapid development of information technology promotes the development of effective technologies of distance education. Meanwhile, the intercultural component of distance learning demands further attention. This paper presents the first outcomes of the survey, conducted by the research team from Dniprodzerzhynsk State Technical University (DSTU) in the framework of the international project IRnet - **International Research Network for the study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences. The** project is financed by the European Commission under the 7th Framework Programme, within the Marie Curie Actions International Research Staff Exchange Scheme. Grant Agreement No: PIRSES-GA-2013-612536; the duration of the project: 48 months1/01/2014 – 31/12/2017.

1. THEORETICAL FRAMEWORK OF THE RESEARCH INTO INTERCULTURAL COMPETENCE OF UKRAINIAN STUDENTS

1.1. Intercultural competence within the system of higher school teaching

In accordance with the Regulations on distance learning, distance learning is an individualized process of acquiring knowledge, skills and methods of human cognitive activity, which occurs mainly via indirect interaction of participants of educational process in a specialized environment that operates on the basis of modern psychological, pedagogical and information communication technologies (Order of the Ministry 2013).

In this context, crucial importance of psychological and pedagogical techniques should be stressed, as they are responsible for the willingness of all participants of the educational process to work and improve distance learning system.

The supreme goal of the creation and development of distance education is to provide students in all parts of the country and abroad equal educational opportunities, as well as improving the quality of education through broader use of scientific and educational potential of leading educational institutions and institutes of advanced training. Distance learning will allow students to gain basic and further education in parallel with their main activity. Finally, the new system of distance education aims to disseminate the learning environment for the fullest satisfaction of the needs and human rights in education.

Grevil Rumble noted that any process of distance learning necessarily involves a teacher, one student or more, the course or curriculum that the teacher is able to teach and the student is able to master; explicit or implicit contract between the student and the educational institution where the teacher works, which defines the respective roles of those who teach and those who learn (Rumble 1989).

Particular importance of distance education is that it assists the formation of intercultural competences of students. The process of globalization leads to wider interaction between different countries, public institutions, social groups, through social movements, scientific cooperation, trade, tourism, and so on. Increasingly, schools will exchange students and schoolchildren, teachers organize joint projects and internships abroad, participating thus in intercultural communication and dialogue of cultures.

Formation of intercultural competence should be considered in connection with the development of students' ability to participate in the dialogue of cultures on the basis of mutual respect and tolerance for cultural differences and overcome cultural barriers. Intercultural learning is aimed at developing students' ability to cross-cultural communication and promotes awareness of students of their ethnic identity, as well as familiarization with the traditions and cultural characteristics of other cultures. Formation of intercultural competence also involves mastering the following skills: to see in other cultures not only the differences, but also the things

that unite us; to change the assessment as a result of understanding other cultures; to get rid of stereotypes; to use knowledge of a foreign culture for a deeper knowledge of their own (Danilova, Surodeyeva 2010).

Speaking of the structural components of intercultural communication we should take into account the studies of A. Knapp-Potthoff, who distinguished affective, cognitive and strategic (in some studies - operational) components. At the heart of the affective component of empathy we find tolerance. Tolerance is the principle of interpersonal relations, moral value and quality of a person who is open to dialogue, understanding and acceptance of another person.

The basis of the second component - cognitive – is formed by the knowledge of the native culture and the culture of the country whose language is being studied, as well as general knowledge about culture and communication. The strategic component includes verbal, educational and research strategies of the student; principles of teaching; forms and methods of learning; forms of study; learning tools (Knapp, Knapp 1990).

M.V. Plekhanova highlights these skills that characterize each level of intercultural competence:

- comparative skills (awareness of the phenomena of other ways of life, their recognition and perception; comparison with their own culture);

- interpretive skills (interpretation of the communicative activity in terms of the cultural determinants of native or other culture);

- strategic skills (analysis of misunderstanding in communication with representatives of other cultures, avoidance of confusion, the use of verbal and non-verbal means);

- empathy skills (acceptance and respect for different value systems and worldview) (Plehanova 2007).

Formation of intercultural competence is possible by explaining the features of perception of the world and sensation of other nations. Intercultural competence always manifests itself in some activity, and in the context of the overall integration and informatization of society intercultural competence can be interpreted as the student's ability to effectively address the problems in cross-cultural communication, which involves a dialogue of mutual understanding, rather than a clash of different cultures.

1.2. The methodology of research into the state of intercultural competence of DSTU students

In this regard, particularly relevant is the study of students' opinion about their intercultural competences. We carried out a survey of students from Dniprodzerzhinsk State Technical University by computer questionnaire which assumed independent students' answers to a list of questions developed within the

project IRNet. In May 2014 we surveyed 184 full-time students of different specialties, of which 49.46% were female and 50.54% male. Of all the respondents 43.48% were students of the Department of Electronic and Computer Training, 40.76% - Faculty of Management, Economics, Sociology and Philology, 5.98% - Metallurgical Faculty, 5.43% - Chemical Engineering at 3.26% - the Energy Department and 1.09% - mechanical department. With respect to courses it should be said that among 184 respondents 75.54% are junior students (I-III years) and 24.46%, respectively, are on senior courses (bachelors and masters). The distribution of the level of education is as follows: Bachelor - 89.67% and Masters - 10.33%. For a more convenient presentation of the material we have summarized the data obtained in the table. We considered significant the responses that were given by more than 50% of respondents.

2. OUTCOMES

Analysis and synthesis of our study indicates that the majority of students rate the prestige of chosen profession very high (51.63%) and high (42.93%). In other words, the overall positive assessment is nearly 95% while 3.26% of students could not assess the prestige of their profession and 2.17% rate it as low.

As to the general store of knowledge we should note that it is very highly rated by 19.57% of respondents, well rated by 69.02%, undecided - 8.7%, badly rated by 2.17% and very badly rated by 0.54%. Distribution of students on the base of overall theoretical and practical knowledge acquired during training is shown in Table 1:

Table 1

Assessment of students' overall theoretical and practical knowledge acquired during training

Evaluation	general knowledge		theoretical knowledge		practical skills	
	Number	%	Number	%	Number	%
Very good	47	25,54%	41	22,28%	51	27,72%
Good	116	63,04%	109	59,24%	112	60,87%
No answer	16	8,70%	27	14,67%	15	8,15%
Bad	4	2,17%	6	3,26%	6	3,26%
Very bad	1	0,54%	1	0,54%	0	0,00%

Source: Own work

According to the study, the majority of students have a positive attitude to learning throughout life (42.93% - very good and 44.02% - good); positively rate the link between theory and practice, which is presented within each subject (21.20% - very good and 55.98% - good); appreciate the benefit of the education received for their

professional activities (38.04% - very high and 48.37% - high); the chances to get a job in their chosen profession were in most cases estimated high (26.09% - very high and 43.48% - high).

In our opinion, special attention should be paid to students' opinions of a university graduate and of a person with a diploma in their specialty in Ukraine. The results shown in Figure 1 prove that the majority of students rate these statuses high. Almost similar data characterize and evaluate students' employment opportunities in the chosen specialty after graduation: 19.57% - very good and 43.48% - good at 13.04% - 1.63% and bad - very bad; 22.28% - are undecided:

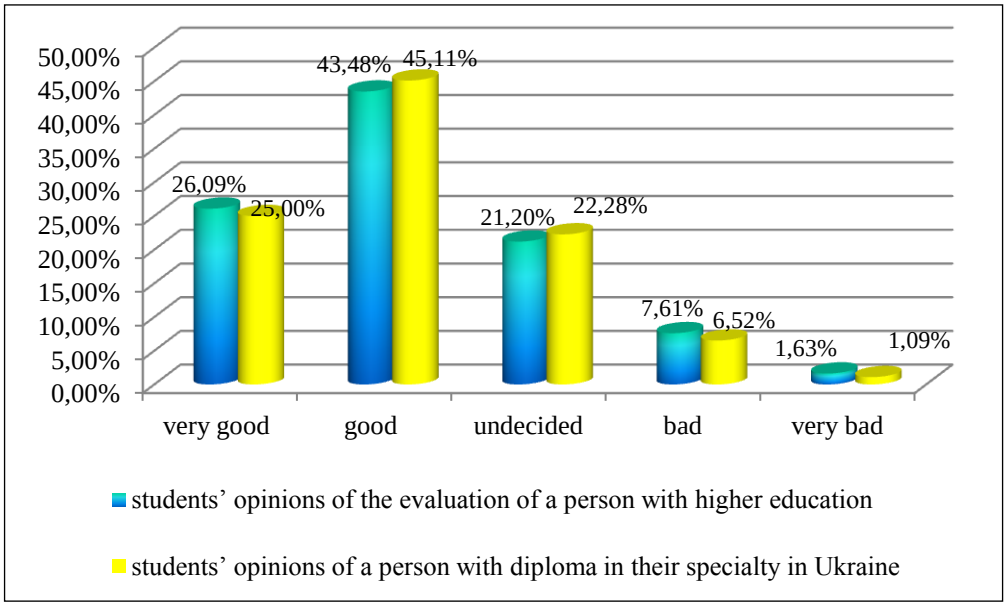

Figure 1. Students' opinions of a person with higher education and of a person with a diploma in their specialty in Ukraine

Source: Own work

In the context of the development and improvement of distance learning, the students were given the opportunity to evaluate the information and communication competence, competence in the field of modern technologies and intercultural competencies they have acquired during training.

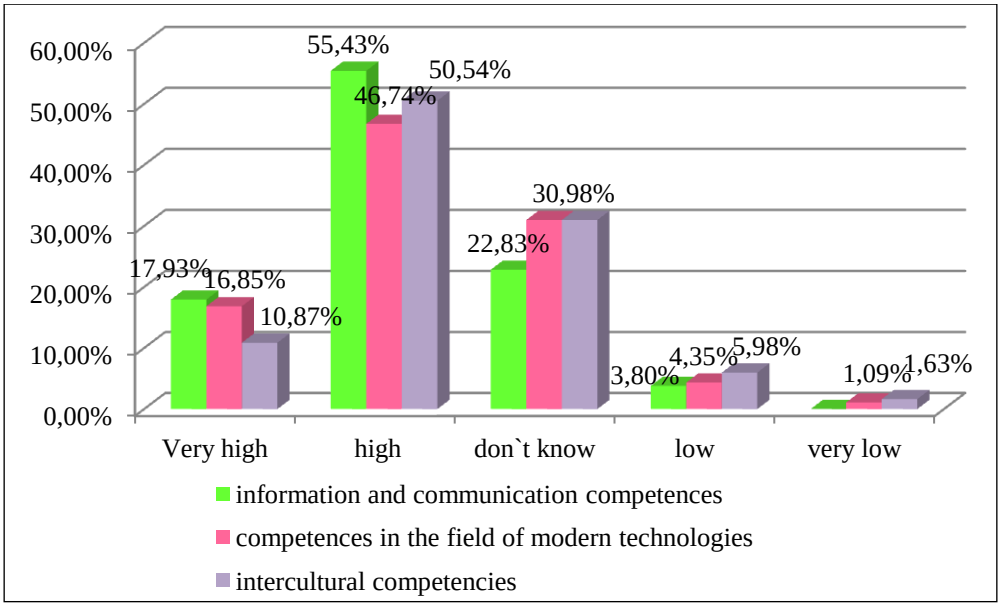

Figure 2. Comparative characteristics of students' evaluations of information and communication competences, competences in the field of modern technologies and intercultural competencies obtained during training

Source: Own work

The highest ratings went to information and communication competence (17.93% - very high and 55.43% - high). The gap between information and communication competencies is not large. In particular, we found that 16.85% of the students rated the competence in modern technologies very high, and 46.74% of the respondents as high. 10.87% of the respondents rated intercultural competences as very high and 50.54% of the students as high. It can be concluded that DSTU students evaluate all of the competences obtained during education really highly.

At the time of the survey, students do not tend to change their country of residence (e.g., there are only 29.35% of the respondents), but want to change their place of residence within the country (44.57%). In our opinion, this situation is due to the desire of students to live in the capital of Ukraine or its regional centers to further improve their abilities, knowledge and skills and the desire to receive decent wages for their work.

Moreover, among those students who want to go abroad after graduation most popular countries are the United States, Germany, Europe, Poland, the UK and Canada (Figure 3)

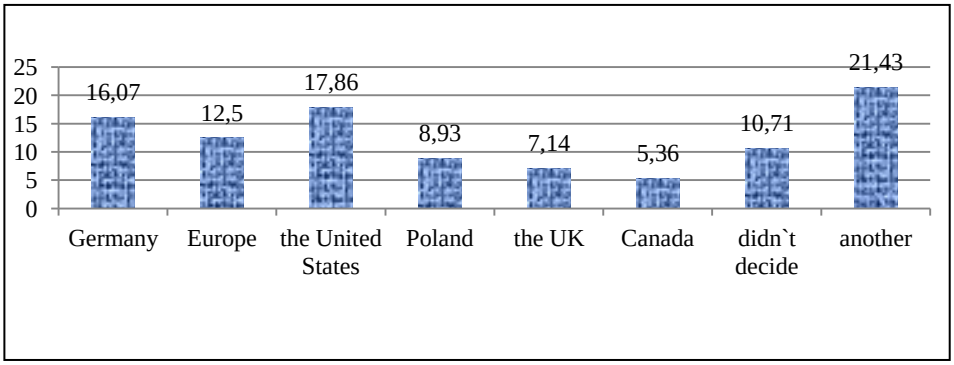

Figure 3. The most attractive countries for students who want to go abroad after graduation (in %)

Source: Own work

The Ukrainians do not mark one particular country that is familiar to most, which shows their willingness to cooperate with other countries. Among the countries that most students are familiar with, firstly, Russia, the USA and the UK were chosen. Secondly, students say they are most familiar with Poland, Byelorussia, the USA, Russia and the UK. Most respondents place Poland, Germany, Byelorussia, Great Britain, Italy and Russia on the third place (Figure 4).

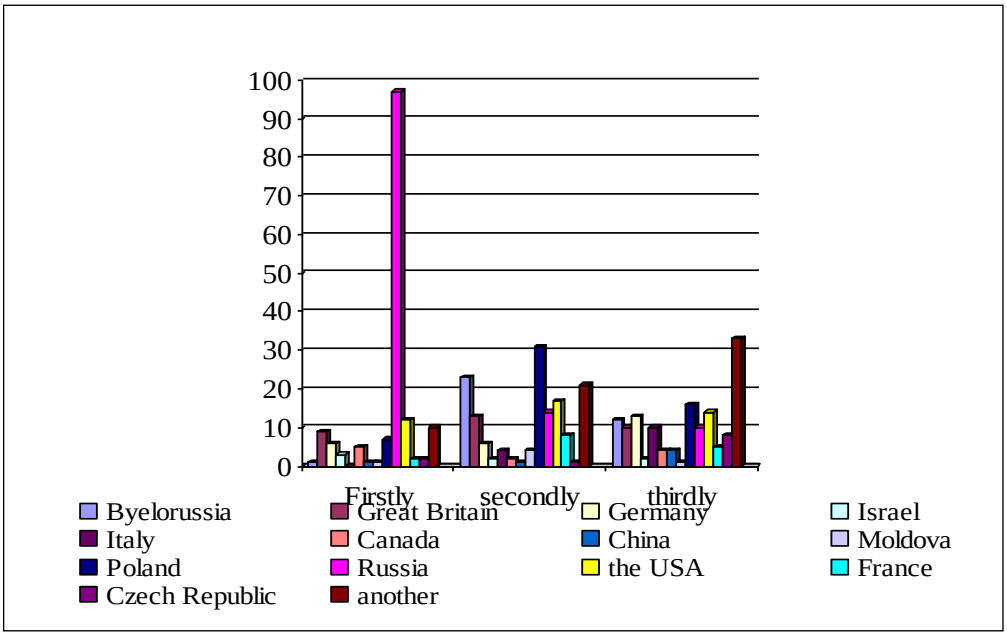

Figure 4. Distribution of answers to the question: "What countries / nationalities other than your own you are most familiar with?"

Source: Own work

Language mastering plays a significant role in shaping intercultural competence. For all the diversity of its functions language is first of all the main information medium. Language competence is a quality of personality, characterized by a complex of knowledge, abilities and skills, enabling the individual to perceive, understand and produce messages in natural language, to maintain such information in memory and process it. In the course of our study it was found that the surveyed students chose:

• English as the first foreign language they speak (102 people), Russian (65 people), Ukrainian (8 people);

• English was selected as the second language (54 people), Russian (33 people), French (30 people), German (13 people), Ukrainian (6) and Polish (4);

•as the third - English (19 people), French (16 people); Russian (12 people), German (11 people), Ukrainian (5 persons), Polish (4 people).

The degree of language proficiency is presented in Figure 5.

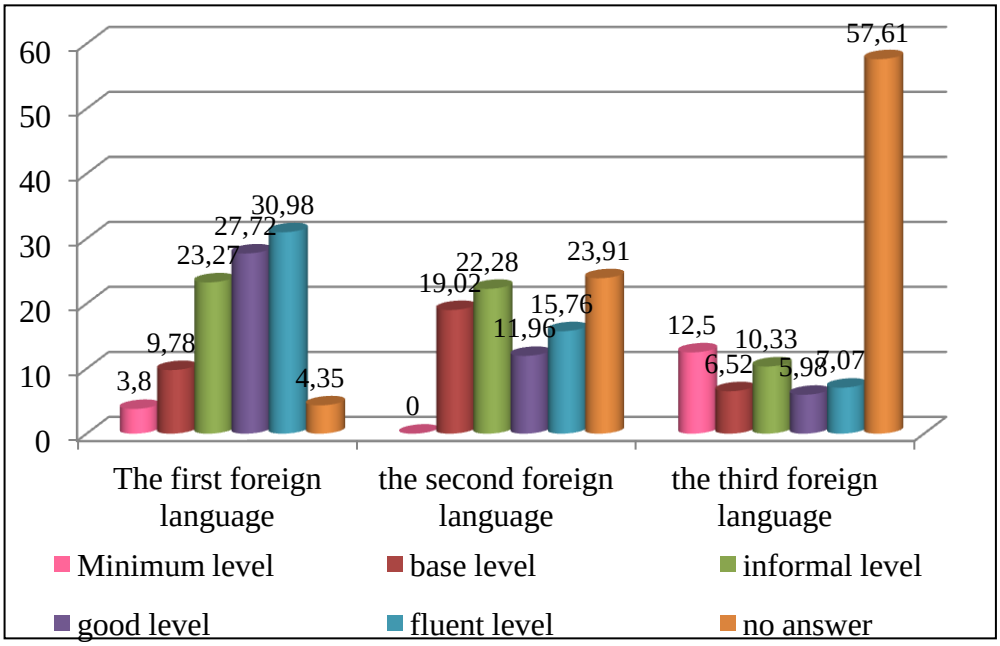

Figure 5. Distribution of the students' answers on the degree of foreign languages knowledge

Source: Own work

The next set of questions of our study was aimed at evaluating the students' competencies as to the country that is most familiar to them. The results are shown in Table 2.

Table 2

Assessment of students' competences as to the country that is most familiar to them

Evaluation	communication in a chosen country	easiness of establishing contacts with representatives of a chosen country	knowledge of material culture	knowledge of social culture	knowledge of symbolic culture	knowledge of cultural differences	knowledge of religious differences
Knowledge (how much they know on this topic)							
very low	10	6	9	9	10	18	14
low	17	20	33	20	19	23	19
average	56	57	67	63	78	65	54
high	45	54	44	50	44	46	47
very high	56	47	31	42	33	32	50
Skills (at what level they can use the knowledge)							
very low	14	11	13	11	12	10	18
low	19	20	27	24	23	36	34
average	54	53	73	64	70	62	62
high	47	61	48	57	50	50	43
very high	50	39	23	28	29	26	27
Motivation / desire (how much they want to do it)							
very low	17	12	13	15	14	17	25
low	13	17	22	19	18	20	20
average	48	52	58	49	53	49	50
high	46	45	56	55	49	56	48
very high	60	58	35	46	50	42	41

Source: Own work

Students were asked to assess their knowledge, skills and motivation as to various competencies concerning the most familiar country. Most students estimate their

knowledge as to communication in the chosen country (e.g. proficiency, understanding spoken language) - 54.9%, ease of establishing contacts with representatives of the selected country - 54.9%, and the knowledge of religious differences - 52.7%. The smallest positive comments are about the students' knowledge of material culture (history, monuments) - 40.8%.

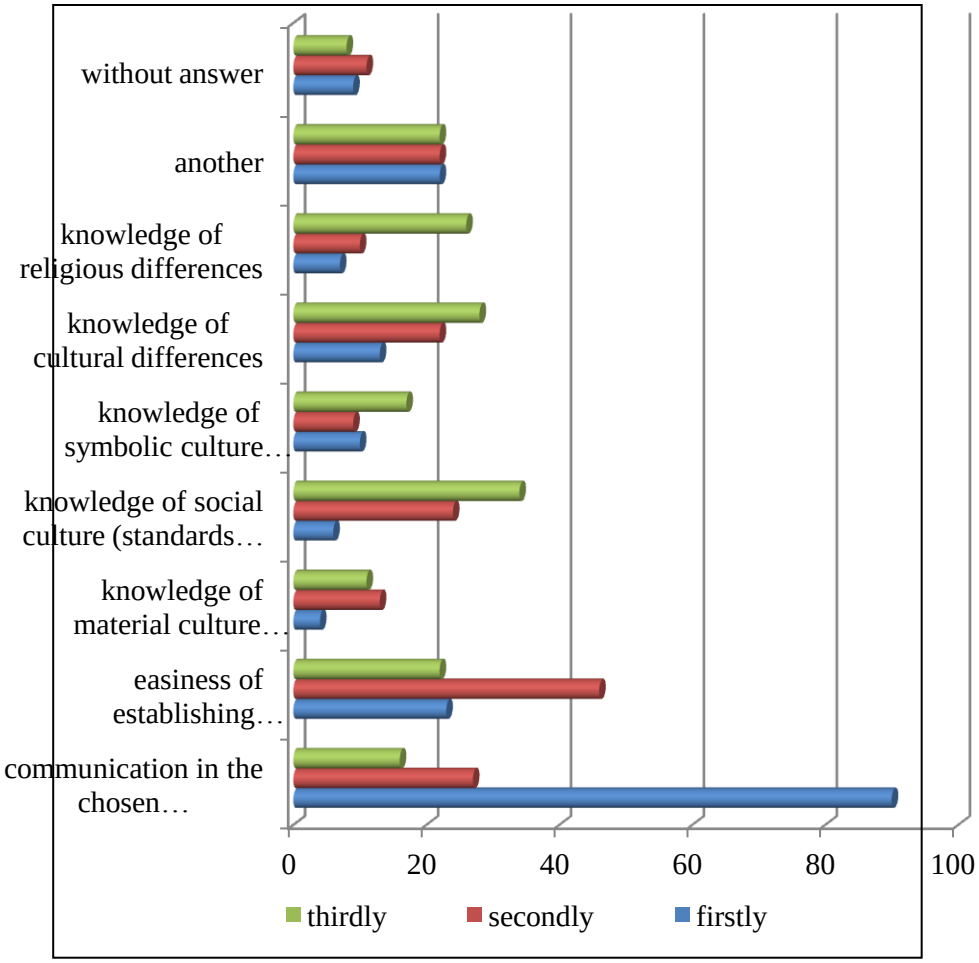

Figure 6 - Distribution of students' answers to the question "What competences do you think are the most important in dealing with people of other nationality?"

Source: Own work

Students tend to estimate their ability to establish contacts with representatives of the selected country as high as 54.3%, communication in the chosen country (e.g. proficiency in language, understanding of spoken language) - 52.7%, as well as knowledge of public culture (norms of behavior, customs) - 46.2%. The smallest

amount of positive ratings on the students' skills went to their knowledge of religious differences - 38%.

It is noteworthy that a large proportion of students highly appreciate their motivation in relation to the selected country. The highest number of positive ratings characterize communication in the chosen country (e.g. proficiency in language, understanding of spoken language) - 57.6%, easiness of establishing contacts with representatives of the selected countries - 56% and knowledge of public culture (norms of behavior, customs) - 54 9% (Figure. 6).

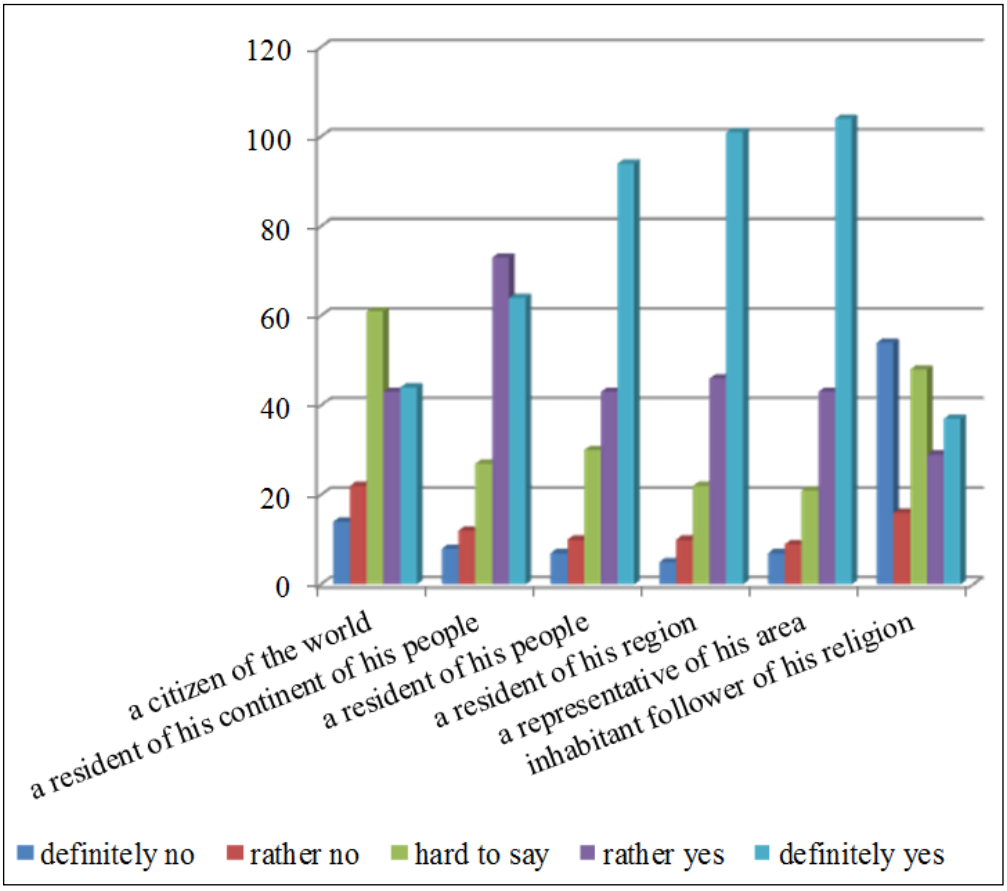

Figure 7. Distribution of students' answers as to who they feel they are

Source: Own work

Intercultural competence, along with the knowledge of geography and nature of the region and knowledge of the language, includes specific skills and experience, the lack of which hinders understanding of a person living in a different culture. In this situation one of the objectives of modern education is to create conditions for the students to acquire experience in cross-cultural communication, to develop skills to communicate with representatives of other cultures. In this context the need to

develop identity and self-identification of students as representatives of various spatial and cultural formations gains particular importance. In the course of our research we have found that most DSTU students feel inhabitants of their region (80%), residents of their area (80%), residents of their continent (74.5%), representatives of their people (74.5%) and to a lesser extent citizens of the world (47.3%) (Figure 7).

On the background of this trend the forming of a favourable attitude of indigenous people to other nationalities and peoples living in Ukraine becomes very important. In general, most of the students point out that the main source of information about other countries is the Internet (28.99%) (Table 3). Also, a significant body of information is transmitted by the media, particularly by television (16.12%). An important role is played by the information received from friends (12.5%), as well as by educational institutions (10.14%). Meanwhile the fact that the least informative source of information about other countries is the family (4.35%) and personal experience (8.15%) looks quite natural.

Table 3

Sources of information about other countries

Variants	Number of respondents	Percent
Own experience	45	8,15%
Educational institutions	56	10,14%
Family	24	4,35%
Friends	69	12,50%
The printed media	57	10,33%
Books	51	9,24%
Television	89	16,12%
Internet	160	28,99%
Other	1	0,18%

Source: Own work

In modern conditions of technological progress Ukraine's aspiration for European integration, diverse relations with other countries make high school teachers think not only about the professional competence of graduates but also about their cultural competence. The negation of tradition, culture, the loss of dignity and spiritual decline are typical of modern society. The variety provided by modern culture puts young people in front of multiple choice, which is not always proper.

Therefore, educational institutions should organize the educational process in such a way so as not to create artificial cultural vacuum around student for temporary existence in it, and try to give the young person an opportunity to understand that it is the basis of his further life and future. This problem is especially important for the graduates of technical universities, as most students pay attention to technical disciplines and are utilitarian to the study of humanities. The problem is particularly relevant now, when society dictates the need for an engineer who is a cultural, intellectual, highly educated, harmoniously developed personality and who is oriented both to cultural achievements of his own country and also to other nations. Now more than ever, the employer requires the specialist to have an appropriate ethical and tolerant behaviour, a culture of dialogue.

In this direction, it is possible for teachers of the humanities to lay the cultural foundation into future engineers so that after graduation they were able to develop it themselves. At this stage of education the formation of cultural competence of future engineers should play a leading role in the formation of specialists (Petruk, Hrechanovska 2013).

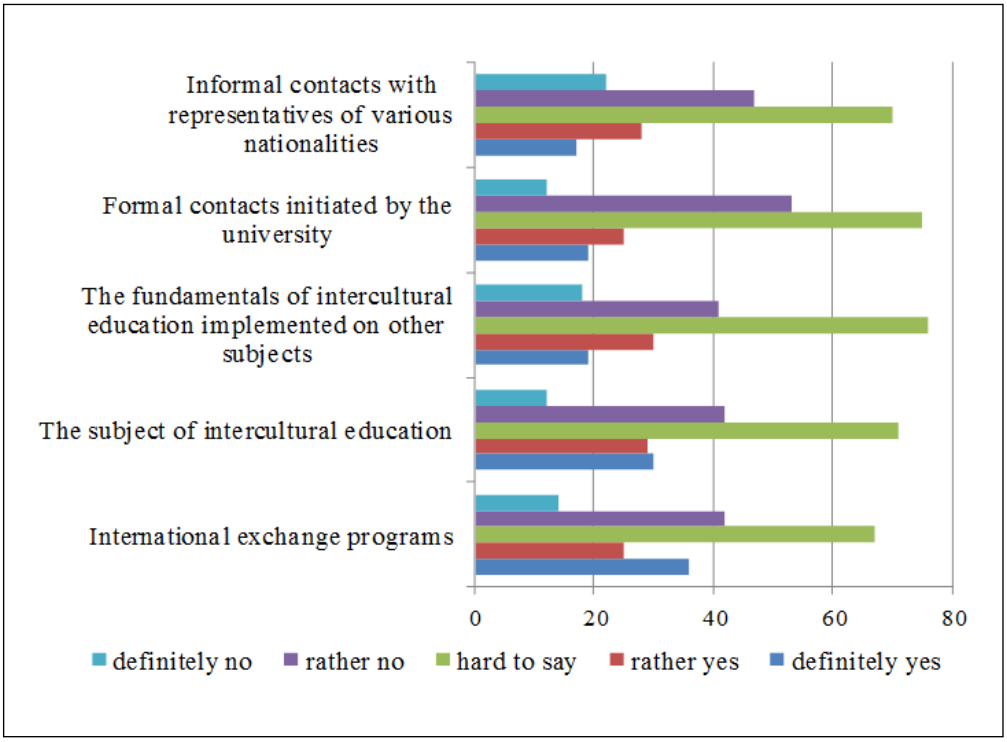

Figure 8. Respondents' distribution of answers to the question "What kinds of activities offered by the university allow you to develop your intercultural competences?"

Source: Own work

In this regard, one should pay particular attention to the role of universities and other educational institutions in the formation of cross-cultural competencies and students' attitude towards them. Among the forms of activities offered by the university that allow to develop intercultural competence students evaluate informal contacts with representatives of various nationalities as the most positive (69 positive comments), formal contacts that are initiated by the university (65 answers "rather yes" and "definitely yes") and the fundamentals of intercultural education implemented within other subjects (59 positive comment). At the same time international exchange programs (eg. Erasmus Mundus) and the subject of intercultural education are the least popular (Figure 8). Such low ratings of the last two forms of activity are associated with low knowledge of students about the programs of intercultural education and inability to participate in them, as well as the lack of subjects of intercultural education in the curriculum. Tours, exchange of students and communication via the Internet were identified among other forms of activities that help develop intercultural competence.

Long-term studies of formation and development of intercultural competences lead us to the conclusion that their value will only increase in future. This thesis is confirmed by the findings of our survey, according to which the majority of students (57.07%) note that the importance of having intercultural competences will increase in near future or remain unchanged (34.78%). With this, only 8.15% of the students surveyed believe that the importance of having intercultural competence will decrease.

It is known that the individual intercultural competence is based on knowledge of foreign cultural standards through their own cultural competence. It is formed on the basis of cultural relativism and tolerance to other people's culture and language, their traditions, social features including communication and behaviour. In the course of our study we analyzed the students' opinion on which people can live in one country (Figure 9). It was found that most DSTU students believe that people who are of different nationalities (82%), inhabit regions with different cultures (72.3%), are of different religions (60%), are different in material status (78.3%), have different religious beliefs (63.9%), have different social (civil) position (62.5%), can live in one country.

With respect to the rights of members of different nations' it is determined that students are tolerant toward representatives of other nations and consider them equal in rights. So it was revealed that 81% of the respondents answer "rather yes" and "definitely yes" about whether representatives of other peoples have the right to get free education; 77.7% - have the right on training in nation's schools with the appropriate language teaching; 78.3% - have the right on a full social support; 83.2% - have the right on a full medical support; 78.3% - have the right for celebration of their national and religious holidays, and 65.8% - have the right on demonstration of their nationality and religion.

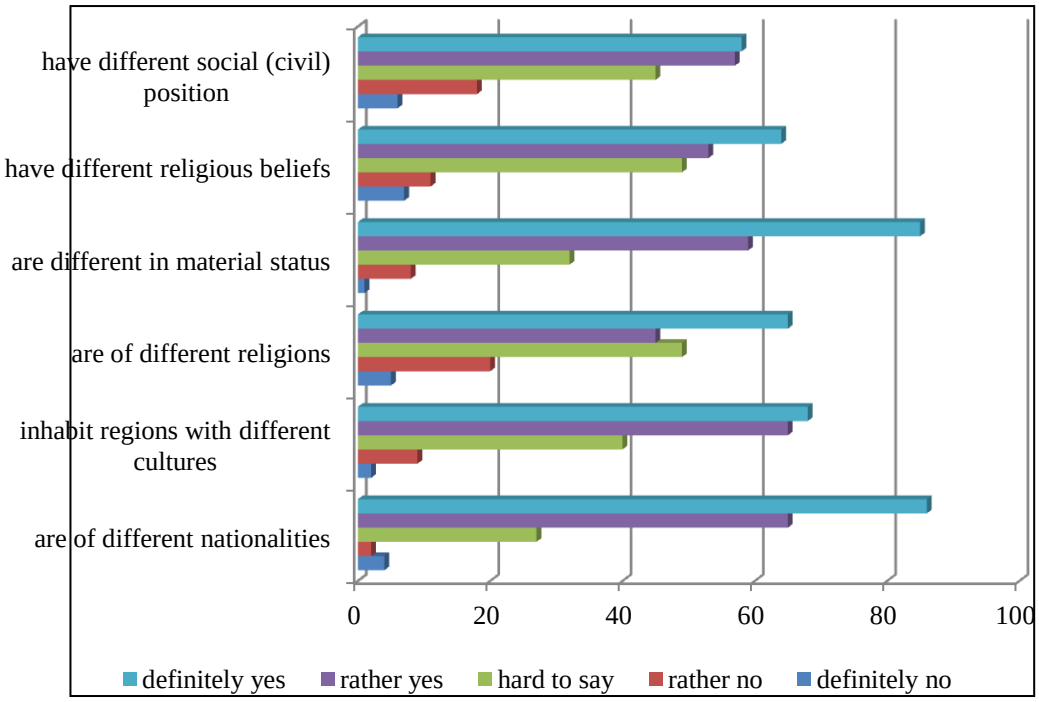

Figure 9. Respondents` distribution of answers regarding the coexistence of different people in the same country

Source: Own work

During the study the students were also given the opportunity to assess the need and the importance of mutual cooperation / exchange with students from different countries. The results revealed that a positive assessment prevails over the negative in all cases (Figure 10). The cooperation with Poland, Spain and the Czech Republic is most positively estimated. The smallest number of positive assessments about the potential of cooperation relates to Russia.

It should be noted that the formation of intercultural competence for future specialists is a necessary component of their professional competence formation. In modern conditions for competitiveness on a labour market one must be able to navigate in a multicultural society, to respect other peoples' culture and not forget their own roots. International cooperation and the success of cross-cultural communication is often based on personal relationships and, therefore, they are dependent on the individual communicative abilities of the partners. This trend highlights the need for a modern expert to develop his intercultural competence, whether he be in the Arts or in Engineering.

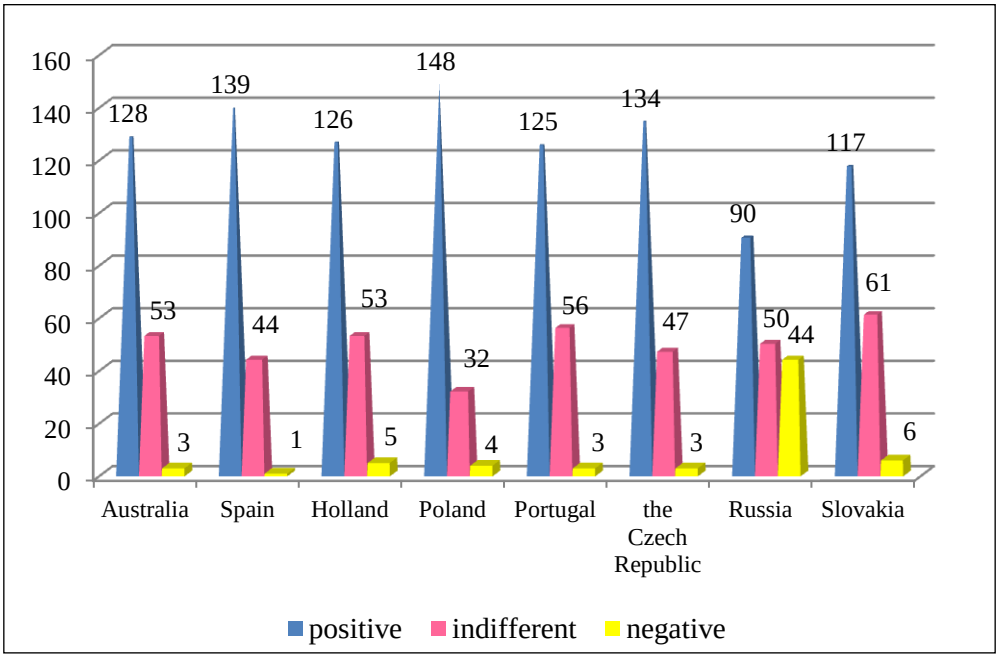

Figure 10. Respondents` opinion of chances of mutual cooperation / exchange with students

Source: Own work

CONCLUSION

It is possible to reduce cultural the distance between employees and partners, to improve the professional atmosphere in companies with international staff, providing tolerance of foreign employees to each other and optimize the process of adaptation of expatriate workers, increase the effectiveness of their professional activities in a foreign country with the help of university courses aimed to develop intercultural competence, as well as focused and timely use of cross-cultural management methods.

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HELPING THE CONSOLIDATION OF AN INTERCULTURAL COMPETENCE: AN EXAMPLE FROM BLENDED LEARNING

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Abstract: *Nowadays, noone can escape the intercultural exchange, and this is especially true when it comes to foreign language students. If teaching elements of culture in a classroom, often using textbooks is most common, constructing an elearning environment helping the students in discovering the Other and preparing them to an intercultural exchange seems complex. In this paper we would like to identify the elements which will be in contact during the intercultural exchange: civilization and cultures. We will then show how we intended to consolidate the intercultural competence of our beginner students in Romance philology thanks to activities and tasks given through an elearning module.*

Keywords: civilization, culture, elearning, intercultural competence, blended learning

INTRODUCTION

" learning a foreign language mechanically involves the presence of some cultural insights. The desire to capture a foreign language or the interest animating the learners in the language classroom always seems to have a cultural component, although it is impossible to assess the importance it has to be given". These words of Jean-Claude Beacco (2000: 17) were about teaching the foreign language in a classroom, but they still apply when this classroom is to be dematerialized. The CEFR itself (2001: 81) insists on the importance of developing an intercultural competency for the learner. Indeed, a mechanical vision of the language is far from being enough in order to understand the other, and learners are more and more confronted to intercultural relationships. The person who learns a language without learning a culture risks becoming a fluent fool (Bennet, Bennet, Allen, 2003: 237). If in the classroom the intercultural competence is developed through the use of textbooks, the interaction between students and the teacher himself, its development through elearning will have to follow a different path. Building the

environment will lead the designer of the elearning activities to carefully choose the materials to be used and the way the learner will have to use them, keeping in mind that autonomy will be the key word.

In this paper, we would like to remind what is "interculturality" and its components, the problems linked to it when constructing an elearning environment, and then to show some examples of activities helping to develop an intercultural competency in an elearning model already used since 2010.

1. CIVILIZATION AND CULTURE(S): THE CORE ELEMENTS FOR AN INTERCULTURAL COMPETENCE

Interculturality is the result of what happens when people from different cultures are interacting. The intercultural competence will be the abilities of the learner to "understand and respect people who are perceived to have different cultural affiliations from oneself ; respond appropriately, effectively and respectfully when interacting and communicating with such people ; establish positive and constructive relationships with such people ; understand oneself and one's own multiple cultural affiliations though encounters with cultural differences" (Barrett, Byram, Lazar, Montpoint-Gaillard, Philippou, 2013: 8).

We have first of all to clearly define the elements coming in contact during an intercultural exchange. Two main groups of elements are present: civilization and culture. For a long time, the difference between the two elements was not very clear.

A good definition of these two elements is given by Renée Dickason (1998: 5):

" Culture is generally considered as the intellectual, moral and spiritual development of people and nations, whereas civilization is seen as referring to the materialization, objectification of this culture, whether in material objects or in political or social institutions regulating a society. [...] According to the Platonic model, culture would indeed be the idea, and civilization the physical incarnation, but also in a way the degradation of this idea."

1.1 Civilization: a declarative knowledge (Savoir)

The first representation of the other is usually based on civilization. When we speak about France for instance, names like Napoléon Bonaparte or Victor Hugo, monuments like the Eiffel tower or Mont Saint-Michel, sportsmen like Zinedine Zidane will be the first cultural aspects to come to the mind of a foreigner. These elements are also called " general knowledge" or "knowledge of the world" by the CEFR (2001: 82). Therefore, elements like History, literature, geography, sports or cinema will be part of civilization. Learners have to know the realizations of the target culture, not only for their general knowledge, but mainly because these elements will often be referred to during discussions (whether the interlocutor will be a native or not), or will have an impact on the way the communication will go.

Teaching civilization might seem easy to implement, especially in elearning, as it is mainly based on an encyclopedic knowledge: the realizations do not change, and we just need to be up to date.

The main problem is not much about speaking about these elements, but about choosing which ones are the most important and how we will interpret and present them. If for elements of geography there are no particular problems, the relevance of dates in History or authors in literature can voluntarily direct the ideas of the learners about a civilization. Therefore the choice will be very difficult, and often marked by the teacher's preferences, motivations or beliefs and this being or not a native of the target culture himself. If in the classroom context the teacher always have the possibility to correct, explain, redirect or complete the information about civilization he has given, this is not always an option as far as elearning is concerned. Of course, one might do it through channels like a forum or chat, however it will hardly be as efficient because very often there will be the lack of one dimension of the language. For instance, if a student in the classroom does not understand one cultural element, his body language might be a signal for the teacher, even if the student does not explicitly say that he has a problem with it. This is unfortunately not an option in distance learning where we will often depend on explicit reactions from the learners.

Therefore, in our choice of elements of civilization, we do have to consider why they seem so important to us, if they are relevant for an intercultural relationship, but also the relevance to our public and their own culture.

The second main handicap when preparing elements of civilization on a platform will be how we will use these elements to develop the learner's competence: it is not enough to just see a picture of Versailles to comprehend its importance to French history. That is why the use of images, texts and other elements will have to be used in a didactical way.

1.2 Culture(s): an existential competence (Savoir-être)

The second component required for an intercultural exchange will be the culture. As we saw in Gaudé's definition, culture is the idea. Culture is a shared dynamical system of values composed of elements such as moral values, beliefs, rules of behaving and interacting in the society (Abdallah-Pretceille, 1983: 41). Knowing the culture is the key for the learner to comprehend most of the communication, and as Beacco underlined it "to teach communication without describing at the same time the social protocols that make up the fabric of language exchange and which define the conditions of success, is to condemn oneself to be unable to answer to the deepest questions of the learners" (2000: 17). To communicate successfully, we need to understand the beliefs, the way of life and the social codes: to understand the everyday life of the target culture, know how to behave and how to react in society.

Of course, there is not one culture, but cultureS: each individual, each group will have his own, therefore it is hard to simply associate one culture to one country or a

community. Each of these cultures will be indefinitely divided in subcultures down to individuals (Bernaus, 2005: 49). Codes will be different if we live in Paris or in Marseille, in a miner family or a manager family, if we are from a generation or another. Abdallah-Preitceille and Louis Porcher (1996: 14) distinguished five types of cultures when teaching language: sexual cultures, generational cultures, professional cultures, regional cultures and foreign cultures. All of these elements will shape the communication.

This complexity will obviously be a huge factor while we build an elearning activity to teach a foreign language. The designer will first have to ask himself which part of the culture will be needed to be known by the learner, but mainly to which culture the learner can most probably be confronted to.

Indeed, to train young teenagers to use only formal language and codes without working a bit on the slang and social codes used between the teenagers of the target culture is to condemn them to fail partly in communication when they will be abroad. Without knowing the generational culture of the target language, communication will be harder for them or lead to misunderstandings or mistakes.

Just like for civilization, bringing cultural elements into an elearning environment will require a careful selection from the designer as for how to treat this element and present it to the learners. The fact that culture is a dynamical system will also require adaptation with time. What is true now might not be true tomorrow, as "cultures are fluid and mobile" (Phipps and Gonzalez, 2004: 62).

Another potential problem here will be stereotypes, appearing because "the real environment is altogether too big, too complex, and too fleeting for direct acquaintance. We are not equipped to deal with so much subtlety, so much variety, so many permutations and combinations. And although we have to act in that environment, we have to reconstruct it on a simpler model before we can manage with it (Lippmann, 1922: 16). For instance, the assumption that the French are drinking wine and eating snails is widely known all around the world, even if a lot of French people do not drink wine and have never eaten a snail.

All these elements will have to be kept in mind when conceiving an environment to teach a foreign language.

2. ELEMENTS TO DEVELOP AN INTERCULTURAL COMPETENCE THROUGH BLENDED LEARNING: THE EXAMPLE OF SPIRAL

2.1 Helping the development of an intercultural competence: skills and know-how (Savoir-faire)

Five forms of learning and teaching can be effectively implemented to develop intercultural competence: experience, comparison, analysis, reflection and cooperative action (Barrett, Byram, Lazar, Montpoint-Gaillard, Philippou,

2013: 17). These five forms can be used to set up activities inside an elearning environment.

The first form, experience, will be to place the learner in new situations by simulation or contact or showing them how people would act or react in the target culture. In distance learning, many tools are available: chat or video conference with natives, authentic video showing natives in action.

With the second form, comparison, the learner is to be faced with something unusual for him, so that he can compare it with what he knows and try to understand how the Other is constructing. Visual documents and texts can be used for this.

Analysis is another form, where inquiry methods will be used to reflect on practices, values or beliefs. Video or audio resources can easily be used to that purpose.

The fourth form, reflection will be the result of a process following the use of the three previous forms. Basically, written production after having experienced, compared and analyzed will bring the student to form his opinion.

The last form, action, will involve activities with people from different cultures, based on reflection. In elearning, this can be done through chat, videoconferences or any project involving the cooperation of a foreigner.

All of these forms of learning and teaching, and thus forging an intercultural competence, can be backed by acquiring what is called transversal competencies: how to exploit information, solve problems, have a critical judgment, create and adapt, increase work efficiency, use the ICT, cooperate and communicate in an appropriate way. The development of these transversal competencies has been the main goal of the introduction of blended learning in 2010 at the Warsaw University Romance institute for students beginners in French language learning.

In a questionnaire submitted to the 1st year students using the elearning module at the end of the year from 04-04-2013 to 24-03-2014 (44 respondents) and 2nd year students from 02-04-2013 to 18-01-2014 (40 respondents) we tried to evaluate their perception of the importance of the cultural part of activities and tasks (tasks are only coming during the 2nd year, 1st year students are working on groups of activities linked by a theme)

Table 1.

1st year students (n=44). While learning French language, you pay attention to: (1-very important to 4-least important)

	Very important	important	Less important	Least important
vocabulary	28 (64%)	10 (23%)	5 (11%)	1(2%)
grammar	21(48%)	15 (34%)	4 (9%)	4 (9%)
Cultural	8 (18%)	20 (45%)	15 (35%)	1 (2%)

aspects				
Written production	12 (27%)	19 (44%)	12 (27%)	1 (2%)
Listening comprehension	29 (66%)	8 (18%)	3 (7%)	4 (9%)
Written comprehension	26 (59%)	11 (25%)	3 (7%)	4 (9%)
Techniques to search information	2 (5%)	11 (25%)	18 (40%)	13 (30%)

Source: own work

Table 2.

2nd year students (n=40). While learning French language, you pay attention to: (1-very important to 4-least important)

	Very important	**important**	**Less important**	**Least important**
vocabulary	33 (83%)	7 (17%)	0 (0%)	0 (0%)
grammar	24 (57%)	15 (38%)	1 (5%)	0 (0%)
Cultural aspects	5 (13%)	15 (37%)	17 (42%)	3 (8%)
Written production	14 (35%)	22 (55%)	4 (10%)	0 (0%)
Listening comprehension	36 (90%)	4 (10%)	0 (0%)	0 (0%)
Written comprehension	26 (65%)	13 (33%)	1 (3%)	0 (0%)
Techniques to search information	9 (23%)	9 (23%)	12 (29%)	10 (25%)

Source: own work

As we can see in table 1 and 2, cultural aspects are not considered as being very important by our students when it comes to learn the language. Mostly will be important the technical aspects, with a big attention to vocabulary and listening comprehension.

And although this makes sense, as a language is to be spoken, these two elements are deeply charged with cultural aspects. Also not considered as very important, the techniques to search for information, which is a transversal competence, is however crucial for us. Indeed, having so much to learn in quite a short time, autonomy in learning is a key factor. When we speak about culture, this aspect is even more

obvious: what one cannot get during lessons must be acquired in other ways. Nobody knows to which culture a student will be confronted, and that is why he must be able to adapt himself and search for clues helping in a better comprehension of the Other. This is also helping to encourage student's curiosity.

2.2 Practical examples: leading to autonomy (Savoir-apprendre)

During the 1st year, some elements of French civilization are seen through different subjects. One of them being cinema. In this group of activities, we confront students to the history of cinema where France took a big place. We present a text and a video about Pathe and Gaumont. There, we just confront students to information.

We then show them an extract of a show from a comic from Quebec where the artists simulate what would be a scene of a criminal film first made by Americans, then by French and then by French Caribbean islands. The students are asked to imagine the scene filmed by a Polish film producer. We push the student to reflect first about cultural differences, confront it to what he knows and analyze it.

Another activity proposed here is on an extract of a very famous film among French people. This film is so well known in France, that very often some parts of dialogs are used as implicit during conversations. In this extract, an allusion to a stereotype about Poles is used. Gangsters are sharing a very strong alcohol, and no one wants to look weaker than others. One of them, to show that this alcohol is not that strong says " I knew a Polish woman who took that for breakfast", meaning that in Poland where people are drinking a lot, this is an alcohol for women and so light that it is for breakfast. We then give them to fill gaps in parts of dialogues, representative of the humor presented in film dialogs from the same dialog author. One of our aim was to encourage our students to watch fully the film and to try to understand the way the French play on words and reflects on stereotypes.

As we see, here confrontation, comparison and reflection are used while bringing some elements of civilization.

At the end of the 1st year, two groups of activities help the students to discover French territory. Here also, looking for the information is essential. These two groups of activities were designed as a trip in almost all French territories and France itself, showing to students elements not so often shown during lessons. Giving a film about a very small French territory named Clipperton, we asked the students to find the full strange history which took place there at the beginning of the 20th century. The story is not so well known but really strange. During chat sessions some clues were given, and most of the students who finally discovered the story were very happy to do so and shared it in the conversations, showing that we indeed encouraged their curiosity, so needed in the intercultural exchange. A reportage was proposed, explaining how people from the islands of Saint Pierre and Miquelon, next to Quebec, are considering themselves and what problems they face. Of course here the activity was pretty easy, as students only had to choose between proposed answers which was the main problem faced by these people. But thanks to

this, they learnt more about this French territory and saw what kind of views and problems one could have in such place. Students also had to reflect on hip hop video clips showing how some young French are seeing their life in the big French cities suburbs and asked them to reflect on it.

During the 2nd year, tasks are given. We place students in simulated situations, confronting them to other cultures: Francophone countries such as Canada (Quebec), Switzerland, Belgium and Francophone countries of Africa, as well as economical culture.

In one of these tasks, they had to be the jury for a festival of African art. In this task, students can discover major African francophone artists in most of the artistic fields. A painting of Ismaila Manga where we see people in African traditional clothes and having a tree on the head is showed. We asked our students to imagine the situation painted. Symbol of roots and identity, the tree is a major element in African culture, and many answers underlined this unusual aspects, very few students having been able to understand the presence of the trees. This was then discussed during chat sessions. We are there in both the process of comparison, analysis and reflection. Thanks to specific website about African music, students were pushed to discover and present the work of one artist they would select. Again, we encourage here to look for something they do not know, and encourage eagerness to discover. We also presented there a quite disturbing sculpture for Europeans, students had to write what inspired them. During a chat I then gave them the interpretation of the artist. In the end, students had to choose an artwork form they discovered and say why it would win their vote to win an art competition.

CONCLUSION

Of course, these examples do not include the confrontation to a direct intercultural exchange with foreigners, there was no common work with foreigners. However, we think that such activities on elements of civilization and culture, as well as the necessity to develop techniques to look for the missing information and be critical about it, helped our students in reaching a bigger autonomy and reinforce their future intercultural competence. When asked what the elearning module helped them to develop, answers were quite clear, as we can see in table 3 and 4.

Table 3.

1st year students. According to you, accomplishing the activities helped you to develop:

	much	average	To a small extent	Not at all
Vocabulary	18 (41%)	17 (39%)	6 (14%)	3 (7%)
Grammar	3 (7%)	17 (39%)	19 (43%)	5 (11%)

Pronunciation	2 (5%)	11 (25%)	11 (25%)	20 (45%)
Spelling	17 (39%)	16 (36%)	7 (16%)	4 (9%)
Cultural aspects	22 (50%)	11 (25%)	10 (23%)	1 (2%)
Written production	9 (20%)	25 (57%)	8 (18%)	2 (5%)
Listening comprehension	24 (55%)	15 (34%)	5 (11%)	0 (0%)
Written comprehension	8 (18%)	23 (53%)	9 (20%)	4 (9%)
Techniques to search information	27 (61%)	10 (23%)	5 (11%0)	2 (5%)

Source: own work

Table 4.

2nd year students. According to you, accomplishing the activities helped you to develop:

	much	**average**	**To a small extent**	**Not at all**
Vocabulary	12 (30%)	15 (38%)	10 (25%)	3 (7%)
Grammar	5 (12%)	17 (43%)	10 (25%)	8 (20%)
Pronunciation	3 (7%)	5 (12%)	14 (35%)	18 (46%)
Spelling	14 (35%)	12 (30%)	9 (23%)	5 (12%)
Cultural aspects	30 (75%)	8 (20%)	2 (5%)	0 (0%)
Written production	18 (45%)	16 (40%)	6 (15%)	0 (0%)
Listening comprehension	18 (45%)	16 (40%)	5 (12%)	1 (3%)
Written comprehension	11 (28%)	20 (50%)	7 (17%)	2 (5%)
Techniques to search information	22 (56%)	10 (25%)	5 (12%)	3 (7%)

Source: own work

Most of them underlined the feeling that their knowledge of cultural aspects and their ability to look for information were much helped. This is only their view, and they might not be fully aware of how deep they learned and what other competencies they used.

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INFORMATION ENVIRONMENT OF BLENDED LEARNING: ASPECTS OF TEACHING AND QUALITY

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Abstract: *The aim of the study in frame of the international project IRNet - International Research Network for the study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences is to understand how the quality of digital learning environment and a new methodology for teaching activities contribute to achievement of learning outcomes sought by modern society. The data from a comparative analysis of regulations in the field of e-learning in some countries participating in the project is represented. The article substantiates indicators of virtual educational environment in accordance with European standard of quality in higher education. The psychodidactic approach based on accounting of general concepts: information, communication and interaction management in a network learning environment used for evaluation of teaching activities in blended learning. The study hypothesis is based on the data obtained from analysis of the students' views and attitudes towards various educational processes in digital learning environment and represents a set of conditions for system formation of university virtual educational environment and the effective use of e-learning technologies. At a later stage of research teachers in all the universities involved in project will be surveyed.*

Keywords: e-learning, International Research Network, survey, quality, digital learning environment, advanced pedagogical practice.

INTRODUCTION

The world is becoming digital, its inhabitants must possess digital technologies and use them effectively in a variety of sectors, including education, science, and business. In such circumstances, the key points are the access to knowledge, functioning in different environments in any place and at any time, the ability to interact with this knowledge, to use it in solving urgent problems. These points can be attributed to the necessary conditions for the development of education, innovation and entrepreneurship.

The modern system of higher education focused not only on the development of future professional competence in a narrow professional field, but also aimed to prepare for a flexible professional work in the new intellectual environment in a changing digital world. For this educational environment must reflect current trends and provide effective and perspective means of professional, educational and self-education activities.

Teachers need to comprehend that the modern generation evaluate and operate not only in the traditional classroom environment, but also in virtual environments. They differ in information and communication behaviour in comparison with the preceding generations; they changed their educational needs. Therefore, the learning environment should be changed appropriately processes occurring in current global world. This poses the problem for education how to prepare new generations for safe and effective learning, professional and social interactions in global information environment. Specific requirements are associated with rapidly changing technology in all professional activities and increasing academic mobility of students and teachers. The article describes several research directions within the European IRNet Project.

The article discusses the new features of the educational environment, organized by the widespread use of information and communication technology. Main directions of assessing quality of a virtual learning environment of the modern university are defined. As an integral part of an educational environment is the teaching activity, special attention is paid to changes in its nature and content. Analysed the legal basis of teaching and educational activities in the open information space. Substantiated research tools of teacher's attitude for the implementation of professional work under new conditions in different countries. Proposals for the efficient organization of blended learning in the modern university incorporated in hypothesis of the study.

1. REGULATORY FRAMEWORK OF “BLENDED LEARNING”

Blended learning is a model of education program in which student learns at least in part through online delivery of content and instruction. Babu M, Sameer (2009) defines Blended Learning as a fruitful effort in integrating live classroom activities including face-to-face instructions along with e-learning to reap the maximum benefits by utilising the best elements of all through effective practices. Different

countries have different legal bases of e-learning using in implementation of educational programs. In Russia over the recent few years there have passed several laws concerning the issues of e-learning, development of infrastructure with the use of ICT, and Internet access. For example, Federal law “About Education” (adopted in December 2012) officially provides the ability to use e-learning and distance learning technologies. Organizations engaged in educational activities are able to use e-learning and distance education technologies in the implementation of educational programs.

Special attention in current Federal Educational Standards is paid to self-teaching activities of students during their professional practice with their fixation in the information environment.

The document “Strategy 2020” (developed in 2011) introduces the concept of long-term development of Russia. One of the trends is the orientation of ICT on the development of human capital, especially in the field of education.

Federal Initiative “Our New School” (adopted in February 2010) names the main characteristics of students as citizens: the ability to give innovative solutions, the ability to choose a professional way, the willingness to learn throughout life. Also, the document names the main trends of education modernization and innovative development: improvement of the school infrastructure, gradual teachers training, and the implementation of inclusive education. All the listed initiatives are impossible to carry out without the wide use of ICT and e-learning.

In the federal state educational standards and licensing regulations to the security of the students of higher educational institutions access to electronic scientific and educational resources are fixed only requirements to ensure every student of higher education access to e-library system of the university and the simultaneous use of the higher education institutions of one or more of the electronic library systems. In the Federal Target Program "Research and scientific-pedagogical specialists of innovative Russia" there are some common guidelines for the development of University information educational environment, which should be characterized by: openness, innovation, information saturation, high adaptability, etc.

In Ukraine the informatization of society has become a public policy at the beginning of the 90's. At the legislative level, this was confirmed in 1993-1994 by the President’s of Ukraine Decree "On public policy Informatization of Ukraine "and the Act of Cabinet of Ministers of Ukraine" Issues of information ".

In the Law of Ukraine "On Higher Education" (the first addition was in February 2002, and the latest - in July 2014) is created the Section 42 of Article 7 "The organization of the educational process," in which is stated that, along with the official remote form it is permitted to introduce a distance form of education in Ukraine.

The next step for the introduction of distance learning in Ukraine was the Act of the Cabinet of Ministers "On approval of the Program of development of distance

education for 2004-2006". The main objectives of the program were the implementation of legal, institutional, scientific and methodological, informational and telecommunication, logistical, human, economic and financial procuring of distance learning; improvement the structure of the distance learning system by expanding the centres network; quality assurance in distance learning system through the introduction of the practice of examination courses and tech distance learning; development of distance learning in higher education for all areas of training; vocational training and psychological support to certain groups, including the unemployed, people with disabilities, conscripts, persons who are in prison, etc.

Today the main normative acts, which directly regulate distance learning, are:

- Ministry of Education and Science of Ukraine on July 7, 2000 № 293 "On Creation Ukrainian Center for Distance Education";

- The concept of distance education in Ukraine, approved by Ministry of Education and Science of Ukraine on 20 December 2000;

- Ministry of Education and Science of Ukraine on April 25, 2013 № 466 "On Approval of the Regulations on distance learning".

The essence of this form of education is reflected in the Schedule of distance learning: remote individualized learning refers to the process of acquiring knowledge, skills and ways of human cognitive activity and mainly is a mediated interaction between distant from one another participants of the learning process in specialized environment that operates on the basis of modern psycho-educational and informational and communication technologies.

The importance of the implementation of distance learning is reflected in the Law of Ukraine "On Basic Information Society Development in Ukraine in 2007-2015 years". The above-mentioned official documents provide full implementation of distance learning in our country and organization of high-quality training of specialists in different areas of qualification, including Masters, which are competitive in today's job market.

However, the listed laws and regulations do not give definite answers to the following question: what are the conditions of the e-learning and distance learning use as a legal way of learning and teaching at secondary and high school? For example, the relation between the number of hours in the remote mode and in the traditional “face-to-face” mode has not been set definitely.

In comparison, in Poland the number of hours in remote mode does not exceed 60 % of the total number of hours of classes according to the Regulation of the Minister of Science and Higher Education of 9 May 2008.

Because the clear rules and norms of e-learning are not fixed at the state level, it is indispensably to develop regulations of blended learning implementation at the university level. The experience of universities in different countries may be useful, because e-learning is intruding almost everywhere.

2. GENERAL CHARACTERISTICS OF THE MODERN UNIVERSITY EDUCATIONAL ENVIRONMENT

The dynamic and actively functioning global information environment alters human consciousness of information civilization. Informatization of modern human activity determines the inevitable transition from the use of signs to sign systems (Tikhomirov 1988), to fundamentally different intellectual methods of solving professional problems, new forms of knowledge representation and communication in advanced multivariate spatial and temporal coordinates. The answer to these calls should be fundamental changes in education, overcoming the inertia of the system dedicated to the reproduction of human capital. This overcoming factor can be and should be, in our opinion, the new part of the educational environment - its virtual network part.

Nowadays the information educational environment based on ICT has already been created and with varying degrees of success is functioning at almost all universities. In many institutions of higher education it is applied as a medium of remote support of full-time study, and the organization of extracurricular homework. But, unfortunately, as experience shows, virtual part of the educational environment often occurs in the same pedagogical paradigm (all threads of educational management underpinned by the teacher and the student acts only as executor of instructions and regulations). Therefore, in this part of the environment does not appear innovative "growth points" and new students motivations, and respectively it does not manifest a new quality of educational activities.

Nowadays the anthropocentric approach to building an educational environment is relevant. Its foreground is not only the tasks of teaching, but also the goals of personal professional evolution in the modern world. The determination of essential conditions in educational environment (information infrastructure and resources, communication, management) is based on a synthesis of knowledge of computer science, psychology and pedagogy. Such a synthesis of knowledge allows modelling and designing a new educational processes and interactions in a virtual network space.

The humanistic sense of the educational environment is stressed by many authors. For example, I. Baeva determines the educational environment as a psychological and pedagogical reality containing specially arranged conditions for the personality formation, as well as opportunities for its evolution included in the social and spatial-objective environment (Baeva 2009). For virtual learning environment, as well as for real, the most important characteristics are the saturation (or resource potential), as well as its structuring (or methods of organization). D. Ivanov emphasizes new specific features of the virtual educational environment as the most important indicators of its quality: the degree or level of local and external interaction for all users and the personal ability to convert (change, enrich) educational environment, operate in it. (Ivanov 2006).

In 2007 in Russia were published the results of several studies based on psychodidactic approach to educational activities. One study (Gel'fman, Kholodnaya 2007) is dedicated to the problem of educational texts design aimed on the intellectual student's evolution. The findings of this study open new perspectives for digital educational resources design. In another study (Panov 2007) revealed the conditions of student's creativity and self-development needs actualization in special forms of cooperation between the learners and the teacher and among the students themselves. In the third study the main concepts of the educational environment (information, communication and educational activities management) were highlighted. These concepts are essential for both classical and virtual environment (Noskova 2007), but only in conditions of interrelated and purposeful change in all these concepts can be predicted the achievement of a new quality level in educational activities.

In its goals and objectives digital network part of the educational environment complements and enriches classic interaction. It implements new technologies of extracurricular learner's activities, supports the current progress of information and communication processes, contributes to modern educational student's inquiry and actualizes network logic of interactions. Pedagogically this environment is built as a nonlinear, multivariate, providing personal multiple choices in rich digital resource base and different methods of communication in solving educational problems. Thus, the educational environment changes dynamically, being adjusted and transformed by the demands of the students and challenges of social and professional environment.

How can we evaluate the quality of a virtual learning environment of high school? How to manage the processes of its purposeful formation? These questions have no definite answer and investigated by researchers in different countries. In particular these problems are included in the work packages of the project IRNet with the participants from the universities of Poland, The Netherlands, Spain, Slovak Republic, Portugal, Czech Republic, Australia, Ukraine and Russian Federation.

3. PEDAGOGICAL ACTIVITIES IN PERSPECTIVE VIRTUAL EDUCATIONAL ENVIRONMENT

In the aspect of educational interactions quality within a virtual learning environment there should be assessed, primarily, pedagogical approaches implemented in it. If these approaches are similar to the traditional, we witness an extensive development of the integrated educational environment. An innovative development is signified by the new teaching methodologies, which result in a new quality of the new aspects of professional competence formation. Such an innovative environment is estimated as a system of educational conditions running on the basis of information and communication technologies, complementary to the traditional processes of socialization and professionalization of a student. In such an innovative environment the new, modern information and communication behaviour of young

people is taken into consideration. Generalized goal of socialization and professionalization can be formulated as the adoption and implementation of teaching strategies "learning through life," the transformation of the virtual learning environment into a multifunctional tool of students' variable of educational activities (on-line, off-line, their combinations, the channels of mass communication, and social media).

Accordingly, it is necessary to assess such factors as the breadth of subjects of educational interaction, the range of solvable new educational and developmental problems, the individualization of student's educational path, the resource richness, the interactivity and sociability in the implementation of educational technologies.

What changes should occur in a teacher's work within the expanded educational environment interactions?

Firstly, a modern teacher needs to learn solving professional problems effectively, both in the classroom, and in the specially created and managed virtual part of the educational environment. It is important to "see" and guide a student's actions in this environment, using appropriate pedagogical techniques. Moreover, it is necessary to organize not only training, but also educational, upbringing interaction.

Secondly, a teacher needs to change the attitude to a student demonstrating any kind of activity in the virtual learning environment. The virtual learning environment is especially helpful for the motivated, active, initiative students. Accordingly, in contrast to the traditional learning process, here the driving forces are: motivation, activity, initiative, and self-organization of students. Students begin to interact with the resources of the environment, with each other, and with the teacher. It is important that educational communications centre is being shifted from the teacher to the learner, who organizes interaction, assimilation of knowledge and the formation of competencies. In such practices the conversion from mass classroom training to more individualized extracurricular educational activities in the network environment is being encouraged.

Thirdly, a teacher needs to start "movement towards" the modern educational needs of young people. Growing up in a rapidly changing information environment, interacting with electronic information from early childhood determines a different information and communication behaviour of the rising generation. Young people have their own ideas about how to be in the electronic environment, and to deal effectively with various problems.

Social networks are the bright examples of such behaviour when young people are active and highly motivated. Actions in social networks are nonlinear, and mostly based on self-organization. Consequently, the virtual learning environment interactions should also use the new forms and formats of electronic resources.

Fourthly, in the new, innovative part of the environment there has to be implemented the principle of new educational and professional practice goals and

objectives, together with the radically new forms of modern specialists' professional competences.

According to the global online survey of e-learning specialists from 146 universities in 47 countries, conducted in 2008, the list of strategic issues of e-learning for 2008-2015 was specified (V. Uskov, A. Uskov 2008). The top ten issues of e-learning were identified as follows: organization administration, educational content, evaluation system, a level of teacher training, financial issues, construction of infrastructure, teaching methods in e-learning, intellectual property, application of innovative technologies, quality.

From the results of this survey, we can conclude that the important issues are related to teacher training technology and implementation of innovative methods focused on the ICT use in the educational process.

The IT competencies formation of teachers, staff and managers of educational institutions, is the reliable basis and an integral part of the innovative educational technologies implementation. The efficiency of a modern university as an institution that trains students for the national economy depends on them. What is more, the information components of such competencies should be updated permanently, depending on the objective changes that occur in education.

Today, it is advisable to speak about the second-generation of information competences of high school teachers. In conditions of the rapid development of ICT-technologies the world is moving from Web 1.0 technologies to Web 2.0; from e-learning 1.0 to e-learning 2.0, based on LMS courses. The learning management systems are supplemented by the learning content management systems (LCMS) and by the rapidly developing e-courses and technologies such as wikis, social networks and bookmarks, blogs, applications that provide access to multiple databases. Similarly to the XXI century skills for a student, we can highlight the new information competencies requirements to a professor of the XXI century.

According to the materials of the mentioned above survey there have been allocated new e-learning teacher's abilities that will be required for the period until 2015. They include: the ability to communicate using advanced technologies; the ability to present an academic material with the use of remote technologies and new educational environments; the ability to motivate students to e-learning; the ability to include students in the process of e-learning; the ability to quickly establish contacts in the medium of e-learning; the ability to manage e-learning course; the ability to adapt to the individual needs of students; the ability to be innovative in the use of advanced technologies; the ability to create educational content for e-learning; the ability to adapt the methods and means of innovative e-learning.

In the period up to 2015 the following technologies during the implementation of e-learning are expected to be widely used: educational portals, digital libraries and institutional repositories, management of educational content, streaming technology, electronic evaluation and assessment, wireless technologies and mobile devices, peer

communication and dialogue, open educational content, online modelling, computer and online games, tools for synchronous online presentations, Web 2.0, etc.

In the context of e-learning implementation the whole training process needs to be reorganized. In particular there is needed a modernization of classroom forms and methods, together with the change of teachers' and students' extracurricular work types. A new system requirements need to be introduced: the new standards of teaching and learning materials, the new system of assessing students. As most teaching materials are placed on the training portal and are available to students at any time, lectures need to be changed: an instructor should express important, complex themes and concepts, while students should study independently the remaining material. In addition, during the lectures students should get acquainted with the appropriate information sources, including Internet sources and a teacher should demonstrate the potential of software created for training on this course. Thus, the acquaintance with the real educational workspace established for the specific academic discipline takes place.

The techniques of organizing and conducting seminars, workshops are also being modified. For their management a teacher explains the system of electronic counselling and works out with the students the skills of professional communications. A teacher should plan and provide training to carry out such group work in network-distributed environments. In solving typical problems there should be widely used computer models and applications.

Under these conditions, the created virtual learning environment can become not just a "zone of proximal development" learning (Vygotskiy 2001), as it happens in the classroom practices, but the area of actual self – the development relevant to a particular student, because it corresponds to the personal aspirations in training and future professional activity. It stimulates the implementation of personal strategies of educational activities, it reveals critical thinking, multifaceted vision of problems. Enriched with a personal information culture, such environment expands the range of formed competencies, especially in today's network format. Moreover, modern cognitive strategies, willingness to share information, collaborative skills, self-actualization, and the desire to go beyond the standard, "anticipation" are being developed.

Thus, we can say that a virtual learning environment, which is closely interconnected with the activities in the classroom, should be deployed in the new teaching methodology. Then, within the walls of the educational institution a student begins to build and implement his/her own strategy of "learning through life" in the knowledge society. The launch of these processes in the educational environment was considered a manifestation of a new quality of educational activities in response to the challenges of contemporary society to education.

For a comparative study of quantitative and qualitative indicators of the high school virtual learning environment within the IRNet project there was developed a questionnaire, the structure that defines the basic qualities of the virtual educational

environment. Among the main categories evaluated are: the legal support of e-learning university infrastructure and information security; the monitoring of the learning process by using e-learning technologies; the creation of a database of electronic resources the assessment of the educational interaction quality in a virtual environment; the management of the of virtual learning environment development.

4. HYPOTHESIS AND RESEARCH METHOD

4.1. Hypothesis of the study

Hypothesis of the study is the following:

A full and varied effect of the e-learning technologies introduction in a university can be obtained with the application of the environmental approach to the transformation of the educational process, i.e. provided purposeful formation of the virtual network environment educational interactions as a part of a holistic educational environment of the university. Considering the close relationship and mutual influence of classroom and extracurricular interactions, in the virtual learning environment should be solved problems, not duplicating the classroom practice. The new problems should be focused on achieving new quality of students' skills, relevant current and future needs of society, employers, among them a special significance should be preparation for "long life learning."

System formation of a university virtual educational environment and the effective use of e-learning technologies occur under the following conditions:

- Regulatory support of a blended learning contributes to the significant intensification of the educational environment transformation processes. Requirements for blended learning, supported at the institutional level, stimulate the systematic change of teaching. In particular, fixed correlation of classes in the traditional and distant mode, together with the developed regulations for teachers' actions in the electronic environment allow the flexible choice of the optimal scenario for the interaction within different disciplines in accordance with the specific subject content and competencies of the teacher in the implementation of remote support students' independent work.

Developed at the institutional level requirements for the content and structure of electronic educational resources for e-learning allow making more systematic process of network educational environment formation. System of electronic educational resources evaluation and monitoring, acting at the institutional level, contributes to a greater transparency and manageability of the network educational environment. In the process of estimating the functioning of electronic resources it is necessary to analyse related resource settings: content, structure and teaching information technologies used in the educational process.

- Clear assessing criteria for teachers' competence in the field of e-learning and purposefully organized teacher training at the university level result in the

improvement of these competencies and in systematic introduction of e-learning technologies in the learning process. Gradually, teachers begin acting in a unified methodology, setting the new classes of solution-oriented educational objectives.

For the formation of the university network educational environment there is required a transparent system of motivation for teachers in the development and use of e-learning technologies in the educational process, guided by the new forms of knowledge representation and communication in extended spatial and temporal coordinates.

- Evaluation of the e-learning quality in blended model of educational process can solve detected problems and increase the influence of "innovative growth points" in terms of long-term and effective network of pedagogical practices. If students participate in the evaluation of electronic resources and the process and results of remote educational interaction it allows taking into account communicational and educational inquiry of modern students.

- Open educational resources of a university not only play a role of the educational process information support, but also increase the openness of the university educational environment, lead to increased contacts and cooperation with external partners (in the implementation of the network educational programs, in the approval of the university status in the educational community, in the implementation of cultural and educational mission of the university). External monitoring of open educational resources contributes to an objective assessment of the e-resource base formation management.

- The development of the university information infrastructure, the organization of all information processes using a single database, the reliable information security system allow a flexible management of the educational process, a variability of educational interactions, and provides evaluation tools.

To confirm the hypothesis the study is carried out in three directions:

- study of university information environment quality indicators ;
- study of student's activity in virtual learning environment;
- study of teaching activities in a virtual learning environment.

4.2. Tools for university information environment quality indicators study.

What is the essence of the pedagogical perspective virtual educational environment for blended learning and what new quality indicators it sets?

To determine the role of virtual part of the educational environment various quantitative and qualitative indicators of educational interaction in the digital space have to be evaluated. In an aspect of the quantitative ratios considered the main role of virtual interaction in organization of extracurricular students activity. The required part of self-extracurricular educational work during the implementation of educational programs officially defined in the federal standards of the Russian

higher education. Extracurricular independent work in bachelor programs can be up to 50%; in master's programs it is up to 75% and more than 90% in graduate programs. It is obvious that at the stage of post-graduate training and corporate training it can reach 100%.

To provide virtual educational processes in digital space it is indispensably to improve the technical information infrastructure of the university, but simultaneously the effectiveness of its use has to be evaluated. In functional digital learning space all persons (students, teachers, administration) possess special profiles. Complex learning systems provide the facilities for collaboratively creation, cataloguing, publishing, editing and tracking content, for managing user's database, for students' behavioural tracking. There are different approaches to the evaluation of the quality of a virtual learning environment. Formal methods analyse information system data using conventional statistical methods or utilizing the advanced data mining methods. Among relatively new, closely related, contemporary research areas are Educational Data Mining and Learning Analytics, comprising systematic harvesting of data generated during the interaction of stakeholders with the virtual learning environments (Drlik, Svec, Skalka 2014).

Necessarily to analyse the objective data describing the availability and use of electronic resources, openness of environment, virtual communications activity, effectiveness of evaluation and control mechanisms in a virtual educational environment.

But not in all cases objective data analysis of the functioning system may contribute to the quality of educational outcomes evaluation.

Consider a European standard of quality in higher education (ESG) the main directions of university virtual environment quality assessment can be distinguished:

- University e-learning policies and procedures for quality assurance;
- Approval, monitoring and periodic evaluation of the digital support of programs and qualifications;
- Information infrastructure and information systems;
- Information publicity;
- Learning resources and student's support in e-learning;
- Competence of teachers in e-learning;
- Evaluation in e-learning.

For each of the directions to determine the e-learning quality we have identified the relevant rubrics which analysis can be done on the basis of quantitative indicators.

Table 1.

Quantitative indicators and tools for determination the quality of the university information environment

Number of indicator	Quantitative indicators in international quality framework	Rubrics for University virtual environment evaluation
I.1	Policies of universities and quality assurance procedures	I.1.1 Availability of educational policy
		I.1.2 Internal University ratings to implement research activities
		I.1.3 Open scientific resources
		I.1.4 Results of the survey of students
		I.1.5 Corporate standards
		I.1.6 Implementation of ISO 9001quality management system
I.2	Regulations for adoption, evaluation and monitoring programs and qualifications	I.2.1 Description of the expected learning outcomes
		I.2.2 Availability of curriculum
		I.2.3 Availability of training programs
		I.2.4 Availability of different forms of learning
		I.2.5 Learning materials for training courses
		I.2.6 Availability of electronic register
		I.2.7 Special (external) quality evaluation commission schedule
I.3	Assessing students knowledge	I.3.1 Special department for managing quality
		I.3.2 Systematic monitoring of students learning outcomes
I.4	Quality assurance of teaching staff	I.4.1 Survey of teachers
		I.4.2 Availability of ICT competency standards for teachers
		I.4.3 Public reports of teachers
		I.4.4 Open portfolio of teachers
		I.4.5 System of teachers training
		I.4.6 Teachers rating system
I.5	Learning resources and student	I.5.1 Educational materials availability anytime and anywhere (Internet access, centralized or decentralized e-environment components)

	support	I.5.2 Accounting student learning styles: training materials in various forms (audio, video, tables, plain text, diagrams, etc.)
		I.5.3 The implementation of students digital resources and services demands by the means of personal learning electronic environment
		I.5.4 Digital educational resources quality monitoring
		I.5.5 Monitoring the level of satisfaction of students providing electronic learning materials
I.6	Information Resources	I.6.1 Records of all student activities
		I.6.2 Accounting student learning outcomes
		I.6.3 Availability of special department on graduates employment
		I.6.4 Availability of public information about the teachers
		I.6.5 Availability of public information about accreditation and its procedure
		I.6.6 Openness and e-representation of qualitative and quantitative accreditation indicators for all training directions
I.7	Information publicity	I.7.1: Openness of key indicators of the University activities
		I.7.2. Openness of research results
		I.7.3: Openness of University accreditation indicators
		I.7.4 Openness of University rating indicators at the state level

For a comparative study of the development of information educational environment in the partner universities involved in the project IRNet, developed a questionnaire for teachers using e-learning. Structure of the questionnaire determined by the main directions of evaluating virtual learning environment quality. Among the main estimated parameters are:

- legal support e-learning;
- university information infrastructure and information security;
- monitoring e-learning the learning process;
- creation of electronic resources database and open recourses;
- quality assessment of educational interaction in a virtual environment
- virtual learning environment management

The survey is conducted to obtain data to facilitate solution of the following research questions:

Do the legal, ethical, human, techniques, social factors influence, determine the development of ICT, e-learning and intercultural competence development in each partner country, each university? Is the university conducting the monitoring of teaching and how? Is the university conducting the assessment of the quality of teaching and IT competences and how? Does the university maintain an electronic resources database and provide information security and how? Is the IT university infrastructure being developed and how? Is the university creating the e-learning platform as well as developing distance courses, on in which scale? Are intercultural competences of teachers and students in each partner country and university developed and, on which level?

4.3. The questionnaire, detecting student's information behavior and attitude towards different networking activities in university information environment

In order to prove the close relationship and mutual influence of classroom and extracurricular interactions in the virtual learning environment the results of the questionnaire for students can be analysed. To achieve the aims of the project the research group developed a questionnaire which is purposed to gain data on the students' views and attitudes towards various educational processes in their educational environments, entailing modes of ICT implementation, intercultural and professional competences. The diagnostic research instrument of more than 60 questions was translated in the students' native languages and presented in on-line versions by the university survey system LimeSurvey and by Google Drive. The questionnaire covered the following topics: 1) Sociological data required for the purposes of the research; 2) The group of questions, in the area of intercultural competences; 3) The group of questions, concerning ICT competences, using social media for extracurricular activities of students; 4) The survey questions which are reflective in nature, revealing students' opinions about the courses and their assessment in terms of substantive, methodological, technological, organizational aspects, and e-learning as a technology, method and a form of obtaining education. Generally, within the IRNet Project, more than 1000 students from partner universities (http://www.irnet.us.edu.pl/partners) are planned to take part.

To characterize the information behavior of university students the special section of questionnaire was formed. The questionnaire covered the following topics:

- students' preferred methods to obtain information about educational and extra-curricular activities;
- students' level of communication activity in a virtual environment;
- students' attitude towards a teachers' activity in the information and communication environment;

- students' educational strategies;
- students' readiness and attitude to e-learning as an educational technology.

As in all mentioned universities applied the distance learning platform Moodle, a special section of questions was designed to explore the self-reported behavior and attitudes of students to the educational activities in e-learning. In this section, not all questions were included as mandatory, as for example in the Herzen University e-learning is not a compulsory form of educational process organization, and some students do not have experience of participation in remote mode courses. Therefore, students answered these questions relying on existing ideas.

Regardless of whether they use or not distance courses, all students have basic knowledge and competence of modern information and communication technologies as learning result of the information cycle disciplines. For example, in accordance with the federal state educational standards of higher pedagogical education in Russia, all first year students have in their schedule the discipline "Information Technology", as a part of a basic section of the educational program.

4.4. The questionnaire, detecting specific features of pedagogical activities in university information environment.

For a comparative study of the development of information educational environment in the partner universities involved in the project IRNet, developed a questionnaire for teachers using e-learning. Structure of the questionnaire determined by the main directions of evaluating virtual learning environment quality. Among the main estimated parameters are:

- legal support e-learning;
- university information infrastructure and information security;
- monitoring e-learning the learning process;
- creation of electronic resources database and open recourses;
- quality assessment of educational interaction in a virtual environment
- virtual learning environment management

The survey is conducted to obtain data to facilitate solution of the following research questions:

Do the legal, ethical, human, techniques, social factors influence, determine the development of ICT, e-learning and intercultural competence development in each partner country, each university? Is the university conducting the monitoring of teaching and how? Is the university conducting the assessment of the quality of teaching and IT competences and how? Does the university maintain an electronic resources database and provide information security and how? Is the IT university infrastructure being developed and how? Is the university creating the e-learning

platform as well as developing distance courses, on in which scale? Are intercultural competences of teachers and students in each partner country and university developed and, on which level?

The next stage of the research involves the correlation of the overall level of development of the information environment of the University, particularly the information behaviour of students in blended learning and attitudes of teachers: who are involved in this process.

5. RESEARCH RESULTS ANALYSYS

This article is focused only on a part of the research that is aimed to prove the correlation between the actual state of a university virtual educational environment development and students' activity in it. Consequently, only these aspects of the questionnaire for students will be described. Below the comparative results of the respondents from three partner universities – Herzen State Pedagogical University of Russia (HSPU), Saint-Petersburg, www.herzen.spb.ru; Constantine the Philosopher University in Nitra (UKF), Slovak Republic, www.ukf.sk; Borys Grinchenko Kyiv University (BGKU), Ukraine, www.kubg.edu.ua.

Table 2 shows the quantitative data of the respondents from three partner universities - HSPU, BGKU and UKF.

Table 2.

The quantitative data of the respondents from HSPU, BGKU and UKF

	Total number of students	**1 course**	**2 course**	**3 course**	**4 course**	**5 course**	**Professional areas**
HSPU	100	53%	42%	5%.			26%, pedagogic (primary and secondary education) 17%, sociology and philosophy 42%, psychology 15%.
BGKU	100	79%	18%	1%	1%	2%	74%, Institute for the Humanities, Institute of Human 26%
UKF	100	30%	40%	10%	20%	0%	100% study program of applied informatics

Source: own research, 2014

During the research students were asked to evaluate the extent of their personal use of the information available for students on the university website. The results are shown on the Figure 1.

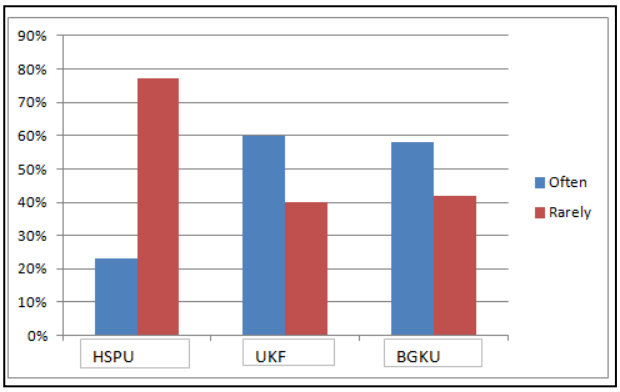

Figure 1. The use of the university website by students

The results prove that students from BGKU and UKF confirm that the website of the university represents the main source of information about the events, schedule of academic year and teachers' contacts. The university site is not the major source of educational information for students from HSPU. They prefer using university pages in social networks.

During the research students were asked which sections of information for students on the university website they consider most important. The answers are shown in Figure 2.

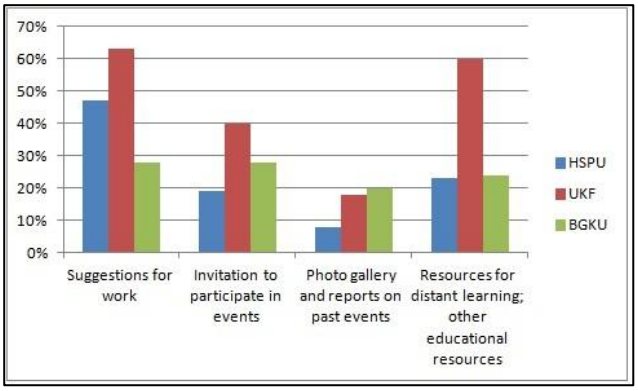

Figure 2. The most important sections of the university website for students

Students named the most important features that make a university site attractive for students. The results are shown in Figure 3.

The results show that students do not intend to show a high activity on the university website. This can be explained by the supposition that students do not realize all the opportunities of the virtual educational environment. Consequently, they need to be shown and explained all the opportunities by academic teachers.

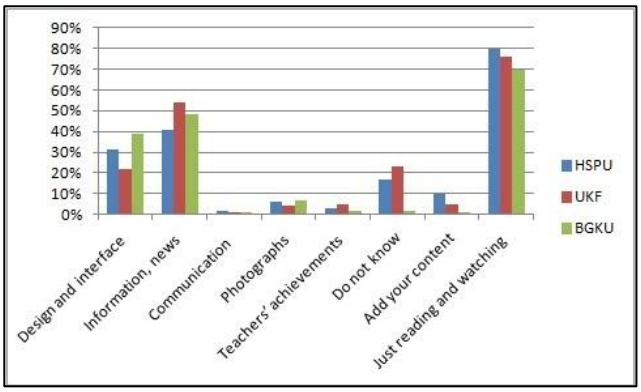

Figure 3. The most important features that make a university site attractive for students

The question of students' attitude to teachers' activities on the university site and the university pages in social networks was also researched. The results are shown on Figure 4.

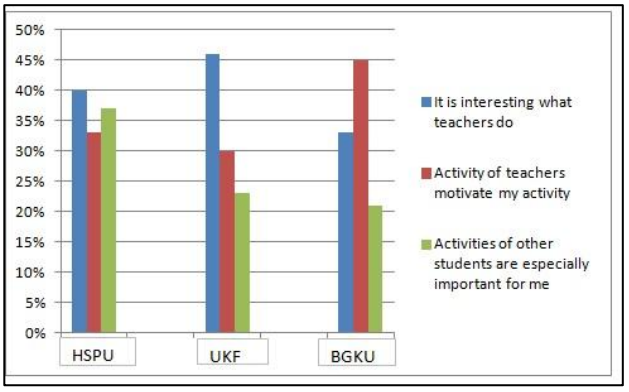

Figure 4. Students' attitude to teachers' activities on the university site and the university pages in social networks

Students from HSPU and UKF are interested in both teachers' and other students' activities in the social networks. It means that the witness activities of others can motivate students to be more active themselves. Comparing the universities the activities of teachers mostly motivate the students of BGKU.

It was also important to find out what methods of transferring the final works for checking to the instructor students consider the most effective. The results are shown in Figure 5.

The obtained data shows that not in all universities students are deeply involved in e-learning. It depends on the university educational policy. However, students are accustomed to transfer their results by electronic methods and consider such way rather effective.

The obtained results prove the close relationship and mutual influence of classroom and extracurricular interactions in the virtual learning environment. The virtual learning environment is effective when it reflects students' interests and demands: not only the educational information (teachers' contacts and timetables) but also employer information and suggestions for work, invitations to participate in events (conference, contests), photo gallery and reports on past events, resources for distant learning and other educational resources. Students need to see the results of all the environment participants activity; in this case their own activity probably will increase.

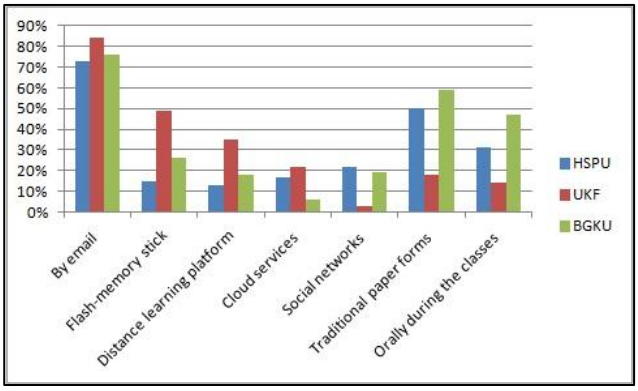

Figure 5. The most effective methods of transferring the final works for checking to the instructor

CONCLUDING REMARKS

Innovative becomes such a learning environment in which its two parts - a classical part and virtual, network part are aimed at addressing not the same, but discrepant goals and objectives. Classical classroom learning environment, localized, stable, stores and consistently develops traditions. Virtual, the network part of the environment - distributed, changeable and adaptive - should be directed to launch innovations. It must reflex the specific character of modern information and communication processes. Teaching activity in e learning should contribute to generation of distinctive psychological and pedagogical conditions for the implementation of individual educational strategies, personal students' development.

New quality of educational activities in the virtual learning environment must comply with the principles of self-actualization, self-learning, attended self-development of students, involved in multiform network educational activities. In this case advanced web-based educational technologies implemented in the new pedagogical approaches, will affect the classroom practice, transforming the whole educational environment to the "high-tech" form. Formation and development of all information educational environment components must be balanced.

Teachers of the information age have to master a virtual learning environment as a new area of their career, as a "new stage" of the educational conditions. Therefor they must be in possession of new pedagogical methodology, innovative approaches for educational interactions. They have to comprehend the specific psychological and pedagogical background of activities in this environment, from mass, in-line training turn to personal-oriented processes based on modern information and communication behavior of young people.

Ongoing research will reveal more precise relationship between student's information behavior, teaching activities in blended learning and virtual learning environment qualities providing perspective educational outcomes for modern society.

ACKNOWLEDGEMENTS

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AN ANALYSIS OF INFORMATION SOCIETY DEVELOPMENT IN UKRAINE

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Abstract. *The article analyzes the development of information society in Ukraine by a retrospective comparison of the Global Competitiveness Index, Networked Readiness Index, E-Government Development Index, reflecting the major trends of ICT use in Ukrainian society. Based on the received results a SWOT analysis of the information society development in Ukraine was made; the main problems and perspectives of its development were determined. The research leading to these results was conducted, within the framework of the IRNet project.*

Keywords: Global Competitiveness Index, Networked Readiness Index, E-Government Development Index, with information and communication technologies, information society.

INTRODUCTION

Global competition is an economic category, which reflects the process of rivalry between entities, regions, countries and nations for access to scarce resources in order to create sustainable competitive advantages in terms of monopolization and the impact of isolated factors. In fact competitiveness today is not only a fight of transnational capital and national economies, but also domestic innovation systems, closely connected with information and communication technologies (ICT). That is why all highly developed countries consider building of information society to be the basis of their socio-economic, political and cultural development and conduct a targeted public information policy.

The main strategic goal of the state information policy in Ukraine is a wide implementation and usage of the new information technologies as systemic factors of political and socio-economic reforms in the country for its entry into the global information community. The key documents that define national policy on informatization are:

The President of Ukraine on July 31, 2000 № 928 "On measures to develop national component of the global information network Internet and providing wide access to Internet in Ukraine."

Verkhovna Rada of Ukraine on February 4, 1998 № 74/98 "On the National Informatization Program".

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Cabinet of Ministers of Ukraine on December 7, 2005 № 1153 "On approval of the State program "Information and Communication Technologies in Education and Science in 2006-2010".

Cabinet of Ministers of Ukraine on August 27, 2010 № 1722-p "On approval of the Concept of the State program of implementation in the educational process in secondary schools of ICT "One hundred percent" until 2015".

State Committee for Communications and Information on December 19, 2003 №8414 / 18-03-23 "On Approval of the Concept of information system of a region and local community creation".

Unfortunately, to assess the effectiveness of public policy in the field of informatization and the development of information society in Ukraine is extremely difficult, as an officially recognized system of indicators needed for such evaluation is absent. Taking into consideration this problem and with the purpose of integrated characteristics of competitiveness of the country in the light of ICT usage we will analyze the following "global" indexes.

WEF Global Competitiveness Index – is a complex instrument of assessment of micro- and macro indices of national economy and its potential to achieve a stable speed of economic growth in the medium-term perspective. The professionals of the World Economic Forum regard ~~see~~ the competitiveness as a set of institutions, politics and ~~the~~ factors, that form the productive level of the country, which influences the level of wellbeing of the population and determines the income from the investments into the economy. The results of Global Competitiveness Index for the last four years are given in Table 1.

Table 1.

Countries' WEF Global Competitiveness Index 2010-2014

Country	GCI 2010-2011		GCI 2011-2012		GCI 2012-2013		GCI 2013-2014	
	Rank	Index	Rank	Index	Rank	Index	Rank	Index
Switzerland	1	5,63	1	5,74	1	5,72	1	5,67
Singapore	3	5,48	2	5,63	2	5,67	2	5,61
Finland	7	5,37	4	5,61	3	5,55	3	5,54
Germany	5	5,39	6	5,41	6	5,48	4	5,51
USA	4	5,43	5	5,43	7	5,47	5	5,48
Sweden	2	5,56	3	5,61	4	5,53	6	5,48
Hong Kong	11	5,27	11	5,36	9	5,41	7	5,47
The Netherlands	*8*	*5,33*	*7*	*5,41*	*5*	*5,50*	*8*	*5,42*
Japan	6	5,37	9	5,40	10	5,40	9	5,40
Great Britain	12	5,25	10	5,39	8	5,45	10	5,37
Canada	10	5,30	12	5,33	14	5,27	14	5,20
Denmark	9	5,32	8	5,40	12	5,29	15	5,18
Austria	*18*	*5,09*	*19*	*5,14*	*16*	*5,22*	*16*	*5,15*
Poland	*39*	*4,51*	*41*	*4,46*	*41*	*4,46*	*42*	*4,46*
Czech Republic	*36*	*4,57*	*38*	*4,52*	*39*	*4,51*	*46*	*4,43*
Spain	*42*	*4,49*	*36*	*4,54*	*36*	*4,60*	*35*	*4,57*
Portugal	*46*	*4,38*	*45*	*4,40*	*49*	*4,40*	*51*	*4,40*
Latvia	70	4,14	64	4,24	45	4,41	52	4,40
Kazakhstan	72	4,12	72	4,18	51	4,38	50	4,41
Russia	*63*	*4,24*	*66*	*4,21*	*67*	*4,20*	*64*	*4,25*
Georgia	93	3,86	88	3,95	77	4,07	72	4,15
Slovakia	*60*	*4,25*	*69*	*4,19*	*71*	*4,14*	*78*	*4,10*
Ukraine	*89*	*3,90*	*82*	*4,00*	*73*	*4,14*	*84*	*4,05*
Moldova	94	3,86	93	3,89	87	3,94	89	3,94

Source: Own work based on The Global Competitiveness Report 2010-2011, The Global Competitiveness Report 2011-2012, The Global Competitiveness Report 2012-2013, The Global Competitiveness Report 2013-2014

Analyzing the control data of Global Competitive Index, it must be mentioned that for the four successive years the ranking has been topped by Switzerland; Singapore keeps the second place, Switzerland and Finland that dispute the third place. These

Northern and Western European countries dominate in the top ten together with Germany, Sweden and the USA.

Ukraine keeps the 84th place having lost 11 positions in the ranking. Such a drop was provoked not only by the worsening of cumulative absolute assessment, but by other countries rank growth. When the progressive countries are transforming themselves into the informative society, building the economy of knowledge, in which the intellectual capital is the main production resource, Ukraine is still the country of raw materials with a very low of generation and the usage of foreign innovations. Weak innovativeness and, therefore, the competitiveness of economy is caused by the fact that Ukraine limited the percentage of high-technology production to the critical number that led to the the reduction of demand for their own scientific-technological inventions, containing the transfer of technology and brain drain (http://www.niss.gov.ua/articles/379, 2011).

The research results in the developed countries show that one of the conditions of a competitive growth is the practice of IT-competencies in the professional life of the employees of different economy sectors. Using Index of Information-Technology Growth we demonstrate visually the relationship between the competitiveness of the national economy and the development of IT (Figure 1).

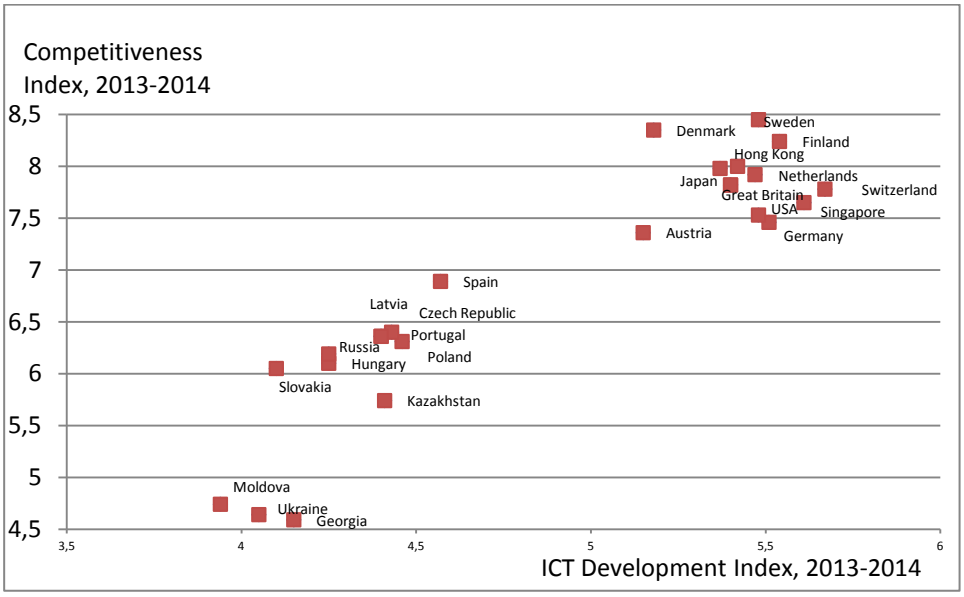

Figure 1. Interconnection of the national economy competitiveness with the development of IT

Source: Own work based on The Global Competitiveness Report 2013-2014, The ICT Development Index Report 2013-2014.

Analyzing the data given above we can see, that the highest values of ICT Index have the highly developed countries, which are leading the ranking of Global

Competitiveness. The place of Ukraine in the matrix is not the best. As a result: low rate of competitiveness, irrational usage of informational resources and intellectual capital, rank loss not only on the international markets of information and innovations, but on the "classic" for Ukraine markets as well.

The model, which determines the level of countries' preparation to participate and use the advantages of the development and demonstrates the bias and advantages of the country in information-technology, is **Networked Readiness Index**. This index is a complex world data of information-technology development. The methodology of index determination was developed in 2001. Since 2002 the report about the research of network readiness by this methodology has been ~~is~~ formed by the World Economic Forum and by the international business school INSEAD included in the series of reports about the specificity of information society development in the world, which are held yearly. This index measures the level of ICT development in a specific country after 71 indicators, which are grouped into three big groups (The Networked Readiness Index Report 2014):

1) the needed conditions for the ICT development (governmental readiness);

2) the readiness of population, business and state institutions to use ICT (individual readiness);

3) the level of ICT usage in the social life, in commercial and state sectors of a country (business readiness).

The results of Networked Readiness Index for the last seven years are given in table 2.

According to the yearly reports, the growth of the general network readiness index influenced, first of all, the readiness of the society and every citizen of our country to improve and spread ICT. In 2014 such readiness was reflected in result-oriented steps of Ukrainian government to improve the network systems. The President of Ukraine Peter Poroshenko at the end of 2014 issued the instruction to prepare legal documents in order to implement modern communication technology in Ukraine – 3G and 4G, which by the guarantor, will lead to the push in the national economy. The process of the implementation of these systems the President entrusted to the new vice-director of the Presidential administration Dmytriy Shymkiv, formerly holding the position of the general director of "Microsoft Ukraine".

The advantages of the high-speed connection 3G and 4G is hard to overvalue, as greater amount of the information becomes accessible to the users, the necessity to wait for some time to upload the "tough" pages or the files of big six disappears. First of all, the comfort of usage and economy of time are the main advantages of these networks. Besides, the mobile connection, that makes it possible for the user to use really high-speed internet at any place, where there is cellular network. For the business video-conferences and video-calls will become an ordinary practice. Thanks to the ability to transfer a big amount of information such networks open numerous opportunities, many of them are still hard to imagine. For example, the

doctors will be able to operate on distance, using the robot equipped surgery labs; the problem of simultaneous translation into the foreign language is nullified – modern programs can already translate the foreign languages in a parallel manner along as ~~the~~ one's speech sounds.

Table 2.

Networked Readiness Index of Ukraine

Years	The number of countries which are being compared	The value of the index	Rank
2007-2008	127	3,70	70
2008-2009	134	3,90	62
2009-2010	133	3,50	82
2010-2011	138	3,50	90
2011-2012	142	3,85	75
2012-2013	144	3,87	73
2013-2014	148	3,87	81

Source: Own work based on The Networked Readiness Index Report 2007-2008, The Networked Readiness Index Report 2008-2009, The Networked Readiness Index Report 2009-2010, The Networked Readiness Index Report 2011-2012, The Networked Readiness Index Report 2013, The Networked Readiness Index Report 2014.

Obviously, the governmental steps have a positive influence on the dynamics of governmental readiness as the part of network readiness of Ukraine to develop ICT at the end of 2014. Of course, governmental readiness will influence positively the business readiness as these categories are interconnected. That is why today we have all the reasons to prognose the improvement of the positions of Ukraine in the ranking of network readiness at the end of the reported year compared to the year before.

Information society formation in the process of integration of Ukraine into the European Union needs our country to follow the higher-level requirements for information security and information policy. This means the use of information technology to enhance the interaction between government, business and the population of the state. Electronic government **(e-government**) is an information field in which citizens can freely interact with the state and use the services produced by the state at any time. Of course, the level of development of e-government in each country is different. The main parameter that determines the level of development of e-government is a comprehensive index, which is based on

the compilation of three components: index of web-services (level of development of Internet services by the government); telecommunication infrastructure index (level of equipment of the population by means of information and communication technologies); index of human capital (characterized by the willingness of the population to use information services).

According to the result of the international evaluation of e-government, in 2014 Ukraine has the 87th place in the world among 193 UN member states. In 2012 our country took 68th place, in 2010 – 54th place. Despite the loss of its position in the ranking, in 2014 Ukraine joined the group of countries with a high index of electronic governance (there are four groups of indices: the highest, high, medium and low). General index of e-governance in 2014 is 0,5032 and in 2012 – 0,5653. This means that Ukraine lost 0,0621 points, which affected the loss of 19 positions in the overall ranking (The e-government survey 2014, The e-government survey 2012).

This trend is justified, since for the last two years in terms of e-government development in Ukraine the planned steps have not been taken. In early 2012, the leadership of a country has adopted the plan providing a transition to e-government by the end of 2014. According to the project it was planned to submit to the parliament a number of initiatives required and as a result to create the public authorities joint e-space. It was assumed that e-government will work on the basis of a single government portal of administrative services. On the basis of this portal the government plans to provide citizens and businesses with a range of Internet services. Controllers together with "Ukrainian State Register" should run such services as the address register (will cost about 5 million UAH), individuals register (will cost 5 million UAH) and entities register (will cost 15 million UAH). In this way, the state will associate the actual address of the location of all Ukrainian and businesses. On the basis of these registers the State Tax Administration of Ukraine will create "The cabinet of a tax payer" (it is planned to spend 20 million UAH to this project). Also together with the Ministry of a Social Policy it is planned to issue the electronic social card (will cost 5 million UAH) and together with the Ministry of Health – the electronic medical card.

For our research we chose the indexes that more or less characterize the level of economic development based on external and internal factors, including ICT (Global Competitiveness Index), the readiness of society (Networked Readiness Index) and the state (E-government Index) to use ICT. However, these indicators are not stable and formed by the experience of previous studies, they cannot be calculated with mathematical formulas or equations, they are absolutely subjective, as fully formed by the experts. This means that the objective forecasts based on these indexes almost impossible. At the same time the received information is a perfect base for SWOT-analysis of the information society in Ukraine (Figure 2).

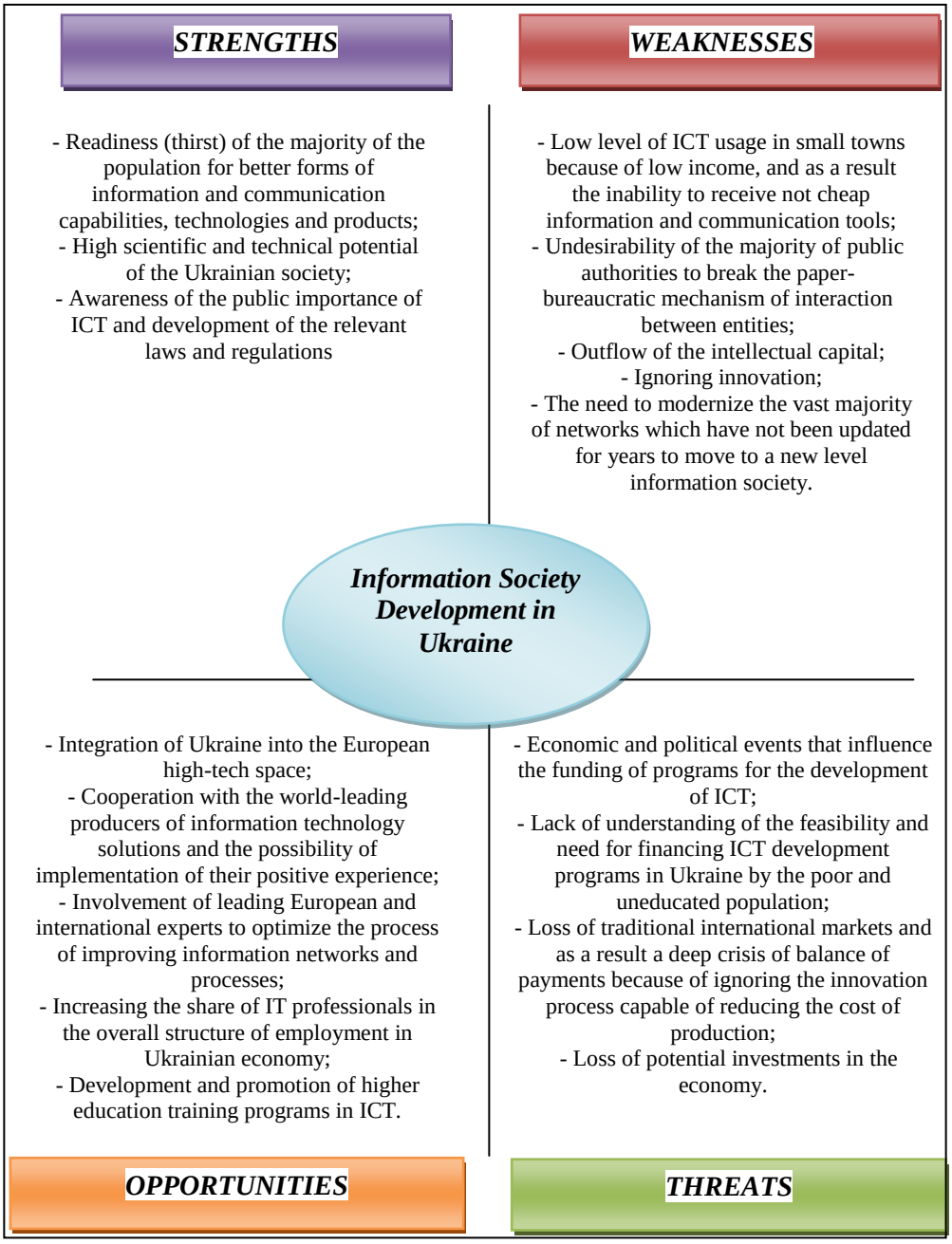

Figure 2. SWOT-analysis of the information society development in Ukraine
Source: Own work

CONCLUSION

In the modern conditions of Ukrainian economy, when almost all its areas need an upgrade, infocommunication industry is one of the important tools to form a new economic system of the higher level. The development of the IT sector and the spread of ICT in all sectors of the economy will not only improve the "global" indexes and strengthen the position of Ukraine in the international arena, but also become a major factor in improving the quality of public administration, education, health and other sectors of society that is essential for the effective long-term goals of a competitive economy.

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E-LEARNING IN THE DYNAMIC CHANGES OF A GLOBAL SOCIETY

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Abstract: *This paper examines a detailed course design for better E-learning in the dynamic changes of a global society. The starting point is based on respect to existing changes in all fields of human activities. E-learning has an important role in this reality with links to innovations, communication skills and the global approach. Described course design is inspired by the project education method and the SCRUM method. The high level E-learning adaptability relies on the variability of study documents (activities) and global communication in course with needed spectrum of final evaluations.*

Keywords: course design, E-learning, global society, turbulence changes.

INTRODUCTION

A new century is in full flow with all the benefits and the difficulties. There are many changes in the styles of cooperation, communication, priorities, and also the devices, tools, or methods used. This is natural, because people will always search for new designs, approaches and procedures. These changes are one from great properties of the current period. (Roekel 2014) The further property is the speed of these changes.

The speed of realized changes is too turbulent. This reality creates pressure on realized activities in all fields of human activities. The speed of existing changes is dizzying and to understand these changes is difficult. The similar difficulties are clearly visible in reaction to ongoing changes in a transforming society. (Transforming society, 2014) Benefit is based on a broad spectrum of solutions and approaches for innovations. Suitable innovations are linked to new approaches, and also to attractive combination of existing solutions, surveys, analysis, case studies, and developed methods.

1. DYNAMIC CHANGES AND DIFFICULTIES IN SOCIETY

Society is affected by the exponential acceleration of interconnecting systems that influence people in various methods. A good example is the development in information technology (IT). Great changes bring in existing innovations and approaches every year. Firms, organizations, and individuals select from a number of products, ways of implementations, configurations, and designs.

Many existing dynamic changes affect people's lives, and people change IT preferences and accesses in time. These changes involve designed solutions and defined approaches via feedback. Information technology has an impact on:

- Trade (business, prices, market).
- Society (information explosion, communication).
- Working life (working environment, safety and training).
- Shrinking of the world (foreign aid, information society). (Transforming society, 2014)

Existing changes are linked to risks. There are a number of difficulties for minimization of these risks. A needed solution brings ideas about global competitiveness and opportunities for suitable development around the world. The important place has developing methods and approaches based on relations between performance and innovation strategy. (Quinn 2014) For an effective application of these ideas, people need optimal skills and experience for better understanding and managing existing changes, risks and approaches in close partnership that is based on creative solutions in the challenges facing society at large. (Thiam 2013) The main skills and knowledge for active solutions are oriented on:

- To develop a new design and framework for implemented information technology.
- To reform existing approaches and methods for design available software, applications and tools.
- To achieve the required balance in society between customers and suppliers.

In this situation, e-learning and education have an important place in society. People need to apply new methods, approaches, skills and knowledge based on IT development with links to societal conditions.

2. IMPORTANT ROLE OF E-LEARNING

E-learning has an important role in the education process. Teachers want to help students to succeed in life. (Roekel 2014) There are also visible changes in the preferences for education:

- Time preferences. (Perez-Arce 2011)

- Educational policy preferences. (Busemeyer 2011)
- Educational preferences. (Zeehandelaar, Northern 2013)
- Study of consumer preferences. (Nazari, Elahi 2012)
- Teaching style preference. (Fries 2012)

Based on these studies, the interest of students is oriented on communication skills, critical thinking, identifying personal interests, self esteem, or study habits. Of course, there are various priorities between the student's goals and the school characteristics. School characteristics are dedicated to high academic standards, high standards for behaviour, technology uses, or character development.

For education, combining all preferences and needs is not easy. The design of an optimal method of study is also very difficult. The difficulties are formed with relation to educational preferences, study of consumer preferences, teaching style preferences, educational policy preferences, and time preferences. The solution offers the highest variability of study documents, study activities, communication opportunities with links to firms, organizations, individuals, students, teachers around the world. Based on optimal study background, students have access into wide spectrum study information and case study for optimal inspiration.

The goal is oriented on the transfer of knowledge needed and skills from selected areas of interest, but that is not all. The teacher must lead students into active combination achieved knowledge and the skills for an innovative solution. The design of such a solution requires a suitable approach based on:

- Responsible analysis.
- Monitoring of competitions with active comparison.
- Searching key features for customers to do attractive product.
- Design solution.
- Implementation in actual conditions with feedback.

The suitable method of creative solution is based on theoretical and practical skills; therefore, students have to obtain new knowledge and skills in the education process based on a simulation of real cases. The start is oriented on easy cases, and further cases are dedicated to advanced examples with an active approach based on variability and global communication.

3. ACTIVE APPROACH BASED ON VARIABILITY AND GLOBAL COMMUNICATION

The aforementioned requests for E-learning also require optimal course design. There are a number of designs based on education platforms such as Moodle. The

Moodle education platform creates a flexible background for offered courses. The question is course design with available study documents and study activities. The optimal design is based on inspiration from the project education method, the SCRUM approach for software development, and societal requests for innovations, communications, and global approach.

Every course has three defined parts that are oriented on initial information about the course, practical activities oriented on the knowledge needed and the skills for individual topics (subtopics), and the final testing. The following table shows a detailed design of a course for students based on practical experience from work with students in an Operating system course. For details see Table 1.

Table 1.

Detailed description course design with respect on actual preferences and needs of students and society

Course design	Available benefits
Initial information	
Short annotation and course structure Defined goals and organization matters Access to study documents and study activities	This initial information brings better orientation about the course. Students must know about defined goals, topics and individual subtopics in the course background.
Practical activities for individual subtopics	
Information researching from available study documents: text files, images, presentations, video simulations, other sources from the Internet, case study, LinkedIn, and YouTube.	A volume of theory is specified that brings the required orientation in the topic. This is important the widest variability of accessed sources.
Information collecting and evaluation Specification of realized steps for active solution Evaluation designed solution via communication and thinking about better solution Researching inspiration around the world	For active task solution, this is important analysis of available information from accessed study documents. This is beneficial for the activation of study activities for optimal support communication and exchange ideas. The video simulations have an optimal place for visualizing the progress of work.
Improvement designed solution Practical implementation and monitoring realized activities	The first design for a given solution can be improved by user preferences. A good method is to monitor realized steps and research better solutions

	Thinking about further implementation in firms	with links to case studies and the final presentation.
	Result presentation	
Final testing		
	Evaluation achieved knowledge and skills	Testing is an important part of education. Standard tests are oriented towards student knowledge and skills. The further interest must be oriented also to study documents, activities and communication. This information helps for improvement of the course based on student preferences.
	Evaluation accessed study documents and activities	
	Evaluation communication abilities	
	Evaluation teacher approach into topic and students	Every teacher must have feedback from the students. Such information also helps to better relations between students and teachers, and better topic description.

Source: Own work

Based on the above mentioned course design, there are possibly the highest combination of various sources of information and activities from the background of a course (such as standard Moodle platform) and sources from the Internet in the form of video, case studies, analysis and surveys. Such an approach could help in a better orientation of the topic (subtopics) with links to a global approach and practice. Active communication leads into a combination of ideas for innovative solutions. This ability is very important for further successful implementation in practice by preferences of users and the global society.

CONCLUSION

The ongoing changes in the global society brings with it many difficulties and opportunities based on new innovations in communications around the world. Education also reflects these changes and teachers help students to gain better knowledge and skills. There are a number of verified education methods, but teachers still search for an optimal approach for e-learning. This is natural because student preferences and societal needs are changing. Active resolution brings the described course design with an impact on global approach and communication skills in the class. This variability involves researching inspiration around the world, thinking about better implementation in practice based on a combination of known methods and procedures for an innovative approach.

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RECEPTION OF 'VISUAL LITERACY COMPETENCY STANDARDS FOR HIGHER EDUCATION' (ERIC, 2011) IN THE POLISH EDUCATION SYSTEM

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Abstract: *In the paper the author describes the cultural and technological context of the visual literacy, coming from the specifics of the developing image culture and shaping of the information society. It shows the results of the pilot research on the Polish students in the scope of specific visual competences. The reference material for the research tasks prepared for'"The legitimacy of visual literacy in the process of education" project was the visual literacy set (Visual Literacy Competency Standards for Higher Education, Chicago 2011) developed in academic and educational environments in the USA (The Association of College and Research Libraries, ACRL).*

Keywords: information literacy, visual literacy, visual culture, information culture, intercultural communication

INTRODUCTION

Contemporary intercultural communication is an interdisciplinary and multifaceted symbolical, social and ideological discussion that takes place according to specific behaviors, norms and customs. It takes place by the creations of a specific society, including art, technology, ideology and education which collectively create an arrangement between the sender and the receiver, based on mutual understanding and acceptance or their denial. We discover the world not only with words and texts but also with images embedded in real life. The visual area makes for a specific plateau of communication in which we can distinguish the following zones: iconic and symbolic, which are the foundation for the language layer of interpretation. It operates with its own language of images and visual representations with references to the extensive rich knowledge conditioned by education, socialization and upbringing (Pulak, Wieczorek-Tomaszewska 2012).

The omnipresent communication in the modern world is entering various areas of life. We speak through images in politics, education and in the mass and elite culture. Irrespective of the finesse conceptions of the designers of the visual campaigns and architects of information, visual images speak to us directly. The acceptance of the visual form of communication, as a method supplementing the message or transforming into a form of message, has a long lasting cultural tradition and sets our senses to value the visual experiences (Dylak 2012, Pater-Ejgierd 2010). The scope and the quality of the messages using images determines their reception and condition the acceptance or rejection of the visual form of communication. They also specify the need for participating in such an interaction.

Symbolic goods, which are within the reach of the communication influences, are the result of the axiological and normative behavior of specific communities. They are subject to quality assessment in the context of the development of the civilization: *communication is cultural through its scope and polite through its quality* (Mikułowski Pomorski 2012).

1. IMAGE IN CULTURAL COMMUNICATION

The existing symbolic world in cultural communication is an extensive area that makes communication possible. The means of communication may be physical goods interpreted in the context of meeting higher needs, including works of art, that provide the speaker with a plethora of meanings, definitions, interpretations, messages through content, form and medium. Coding and decoding information is no longer an issue. So difficult in regular interpersonal communication, it does not differentiate the common world of symbols and meanings. Due to visual forms in paintings, sculptures, architecture, visual arts, conceptual arts, performance arts and other messages that operate with image – identity, stereotypes, prejudices, otherness - are becoming the source of knowledge, unraveling new meanings and interpretations. Enriching culture through development, creating new schemes for knowledge.

1.1. Efficiency of communication

The condition for *sine qua non* of communication efficiency is the mutual understanding of the participants in the act of communication. Cultural interaction is based on a code that is common for both the sender and the receiver. It takes place within a community which has a history of cultural development. In the scope of mutual experiences specific interpretations of events and experiences emerge which depend on internal factors which make up the communication plateau. They specify a life model for the community which was shaped by the processes of acquiring knowledge and bringing experiences together. It emotionally tinged due to the involvement of the participants and references to a common past.

The visual message plays a twofold role in communication: subject as the message and the physical as a means of communication. An image can be utilized for a conversation on different quality levels, bringing up various artifacts, adjusting to a specific situation and standing for the necessity to be understood. It depends on the audience and on their intellectual potential and achievable levels of abstraction.

1.2. Intercultural communication

Efficient communication within the boundaries of a country does not meet any cognitive barriers, however, the phenomenon of generating differences is quite common in the multi-nation and multi-cultural aspect. It differentiates upbringing and cultural education, socialization, ideology, history, system of norms and values. In such a situation the basis for searching for common plateaus of communication is the cultural heritage. The identity foundation of the global community is based on elements in different contexts as a whole but uniform and mutually accepted with respect to systems of values. They should facilitate understanding, tolerance and acceptance which will allow for freedom of movement in areas of different lifestyles in the future. There is an agreement between cultures which aims at understanding others and being understood. Intercultural communication is a value that allows for acquiring information on other worlds, building new schemes of knowledge by meeting people and understanding their behavior, and it allows for creating new communication values in various forms and scopes.

Intercultural communication in the modern world is interactive which mean that it activates all senses in order to establish communication. It engages the participants and draws from various media - within those media there is a flow of symbolic goods, beliefs, customs, conventions, values, norms and actions (Mikułowski Pomorski 2012). Intercultural communication is an interdisciplinary knowledge, it can be studied within different branches of education. J. Mikułowski-Pomorski lists the following areas that analyze modes of communication: cultural anthropology, psychology, social psychology, sociology, linguistics and semiotics, rhetoric and communication knowledge (Mikułowski Pomorski 2012). According to Edward T. Hall, culture is *the content of inter-human communication* (Hall 2001), where the message is a set of situational methods of thinking and behavior models created by humans. G. Hofstede adds values and attitudes to this mental program or community which program the cultural message and are aimed at dominating others (manipulation), co-existence (interaction) or expressing oneself (expression) (Hofstede 2007).

Visual communication facilitates understanding other traditions and values within a uniform community. Visual information generates images which, interpreted upon entering the world of icons, become a cognitive process.

2. VISUAL LITERACY

The transformation of the 21st century, which is becoming more visual rather than text based, is caused by the ubiquity of images and visual media that interfere in the life of a human being. New technologies allow to use visual content freely as well as create new forms of messages by everyone. Imagination is not only a supplement of information but it can be used in a creative way at the initial stage of formulating content. It can bolster interpretation skills where people will be prepared beforehand to use and create visual content critically. Visual competences allow for full participation in culture and visually focused community.

The transformation of a modern society and a clear domination of the visual under the influence of images and visual media make a significant impact on shaping the life of a human being. The ubiquity of visual information used in intercultural communication (education and science, social life, culture and arts, advertising, architecture) does not always go well with the quality of visual interpretations of cultural texts, and usually, many a time, wrongly decoded handicaps cognitive processes. Cultural and contextual references of visual information require knowledge coming from the cultural capital acquired through generations, including visual knowledge understood as modes of visually transmitted knowledge embedded in the education system (Schnettler 2011). It allows for expanding interpretation skills of visual data, their critical and creative use as well as acquiring new ones, simultaneously adjusting to the legal and ethical standards of their use.

2.1. Research Visual Literacy

Extensive studies conducted by the author of the project "Legitimization of visual literacy in the learning process" consist of a multicultural and technological context, evolving from the specifics of the evolutionary culture of the image. This program encourages the information technology skills to be used in practical ways in the learning process. The assumption of the research project implemented in academic bodies is to release the creativity and the cognitive potential of the young generation in the scope of the visually transmitted information (conception, searching and acquisition, interpretation, assessment, usage, designing and sharing). There will be an analysis of the effectiveness of learning in visual literacy based on the results from the seven cognitive areas. The study on visual skills tests objects as well as social standards and activities in the context of interpreting culture, in connection with evaluating the effectiveness with regard to Information Technology. Having visual competences, humans should also be critical consumers of visual media as well as competent participants of the culture in visual knowledge. In the interdisciplinary environment of the academic community such a person should be capable of:

1. Defining one’s informational needs, including types of necessary visual materials.

2. Effective and efficient searching of images and visual media in the available resources.

3. Interpreting and analyzing the meaning of images and visual media in the cultural, social and historical context.

4. Evaluating of images and verifying their sources.

5. Using image forms in order to effectively visualize terms, phenomena and processes.

6. Designing and creating one's own visual messages.

7. Having the knowledge of ethical, legal, social and economic issues related to the process of creating and using images and visual mass media, including the familiarity of the legal systems defining the scope of copyrights (*Visual literacy*, 2011).

Working with visual information should be based on searching skills, usage, sharing and creating visual materials and as well as on the ethical and legal awareness of sharing and distributing visual content. It is one of the elements of the information competences skill set of the contemporary society which combines information skills, interpretation, culture and visual communication with technological capabilities in terms of using digital media.

In the context of global learning *Standards* is a positive example of actions meant to unify the strategic competence and didactic priorities that create new possibilities for using and evaluating visual methods of work and their professional development. Categorization of visual competences is marked by the behavior of the contemporary information society which information needs may be met through new emerging visual interpretations of knowledge (ex. http://scimpas.org). Abstract thinking elicited by images, similarly as traditional linear memorizing, responsible for expanding knowledge and intellectual development, refers to the intercultural intellectual resources. In light of the endless amounts of contemporary information, their acquisition depends on the specific mode of recording information which facilitates cognitive processes of structuring, systematizing, symbolizing, generalizing, abstracting, etc. The image as a synthetic set of various contents - data, relationships, phenomena, hypotheses, conclusions, ideas - meets the cognitive needs even of the most sophisticated academic environments and it currently functions as an independent body of knowledge susceptible to analysis and research according to specific disciplinary dogmas. In countries with an advanced information potential the visual methods are commonly used in learning for theorizing, making a point or proving hypotheses (Wieczorek-Tomaszewska 2014).

The analyzed standards and competences within visual literacy may be a step forward for the Polish education system at the academic level in order to spread the visual methods within the higher education system, reaching out to the needs of the modern multicultural information society.

3. VISUAL COMPETENCES IN LIGHT OF OWN RESEARCH.

3.1. Methodology

The selected research methods were determined by the goal of the project, save the unilateral analysis of the visual literacy phenomenon (statistically in the aspect of the representativeness of the results as well as acknowledging the quality). The project included the quantity approach as well as the quality approach. In order to organize the obtained information the SWOT analytical tools were used, which are a starting point for further explications. The triangular method used in the project, meant for the supplementary usage of diverse techniques (two types of reconnaissance, questionnaires, data analyses) and sources of data (Polish and American students) makes for obtaining a depiction of the phenomenon from different perspectives and allows for better explaining the visual skill issue of the studied group as well as for determining the factors which influence the increase in the education activity in that field.

There is an analysis planned on the effectiveness of learning in the field of *visual literacy* based on the results from the seven cognitive areas. The author's goal for the participants of the research project was to play the role of critical consumers of visual media as well as competent participants of the visual knowledge culture.

The assumed classification in the project, based on *Visual Literacy Competency Standards for Higher Education* (*Visual*…, 2011) is aimed at analyzing the actions of the participants in an interdisciplinary environment of information of the higher education system in the context of defined competences (table 1.)

Table 1.

Seven groups of visual competences Tasks and indicators

Competence tasks within visual literacy	Indicators
S-I. Define your needs in terms of image	Areas of exploration
	Sources
	Criteria
	Generating ideas
	Types and formats
S-II. Find images	Research programs
	Identification
	Selection
	Discoveries
	Organization
S-III. Interpret and analyze images	Observation
	Textual data
	Contexts
	Understanding the meaning

S-IV. Assess image usefulness	Source credibility
	Effectiveness
	Aesthetics
	Transformation accuracy
S-V. Effectively use images	Goal of the research project
	Using technology
	Impact on the project
	Communication
	Visual thinking (logic)
S-VI. Create new images	Graphical representations
	Experimenting
	Creative reusing of visual motifs
	Visual conceptions
	Choosing the best project
S-VII. Ethically quote images and videos	Intellectual property
	Copyrights
	Censorship
	Privacy
	Documentation

Source: Own work based on 'Visual Literacy Competency Standards for Higher Education', 2011

Visual skills are considered as a part and an extension of the information competences of the contemporary multicultural society which allow for freedom of movement in the intricacies of the information and communication systems. Within the information culture they bring together *information literacy*, interpretation and visual communication with technological skills in the scope of using digital media (Batorowska 2013). Images make for individual objects of knowledge, that retain their structure and logic (infographics, simulations, schemes, multimedia messages) and are susceptible for interpretation and academic analysis. They are aesthetic conceptual objects, designed to take the human perception to different levels of analysis. In environments based on standard textual methods of obtaining knowledge they require specific cognitive skills which facilitate modeling of conscious and abstract thought processes (Wieczorek-Tomaszewska 2012). As a tool for the information architecture they introduce structural designing of the information space meant for organizing information.

3.2. Report of the pilot research program of the visual literacy in the academic environment

The presented report of the pilot research program is an introduction to the project implemented under the author's research: 'Legitimization of visual literacy in the Polish academic environment' (*VLS No. A*). The project consists of groups of

students selected from academic circles all over the country, based on the quota sampling. On the basis of the presented stage of the research project which included five focus groups in five academic centers (Pedagogical University in Cracow, University of Science and Technology in Cracow, University of Silesia, Warsaw Polytechnics and The University of Gdansk), the main focus was on the analysis of understanding the definition of the visual information in the context of the Lengler and Eppler's typology (Lenger, Eppler 2014) and on the diagnostic measurements of the scope and type of *visual literacy* in the context of *Visual Literacy Competency Standards for Higher Education* [*Visual*…, 2011].

The first stage of the research (diagnostic tools of *Visual Literacy Standards No. A*) consisted of study activities aimed at making an initial diagnosis of the explored phenomenon by defining the appearance of the focus group, analyzed with respect to the knowledge of the studied skills (fig. 1).

The research results show that respondents do not have difficulties in determining the goal, type and scope of conducted visual activities (*1.*). They can properly define the need for using images in specific situations and plan the effectiveness of their visual activities in relation to the set learning goals (98%). A similar proficiency is declared with respect to workshop and logistics related skills (*2.*) of searching, acquiring and sharing visual materials on the web. The two above skills do not pose any problems whatsoever for the respondents because their source is in the natural activity coming from the need to "exist" on the web, using its resources and communicating with people. Less prepared were the respondents with respect to other analyzed *visual literacy* standards, connected with the quality approach to the visual information, i.e. (*4.*) evaluating the image and its source and (*5.*) choosing the visualization method for efficient visualization of data, relationships and ideas - these are the skills which were declared by 60% of the respondents. Even less of the respondents (58%) declared that they accurately interpret and analyze the meaning of images (visual activities) with an appropriate reference to cultural, social and historical texts (*3.*). The creative approach in terms of visualization (*6.*) connected with the ability to create visual messages would be used by only 40% of the respondents. The rest of the respondents did not have the chance to try out their visual information skills, be it using traditional or digital methods, during their institutional education process. Yet a worse score was obtained with respect to the standard which main focus is the ability to properly function in the Internet reality (*7.*), connected axiologically to the set of norms and rules in the modern information society. As much as 75% of the respondents do not posses the sufficient knowledge on ethical, legal and economic topics connected with the process of creating and using images, and visual means of mass media.

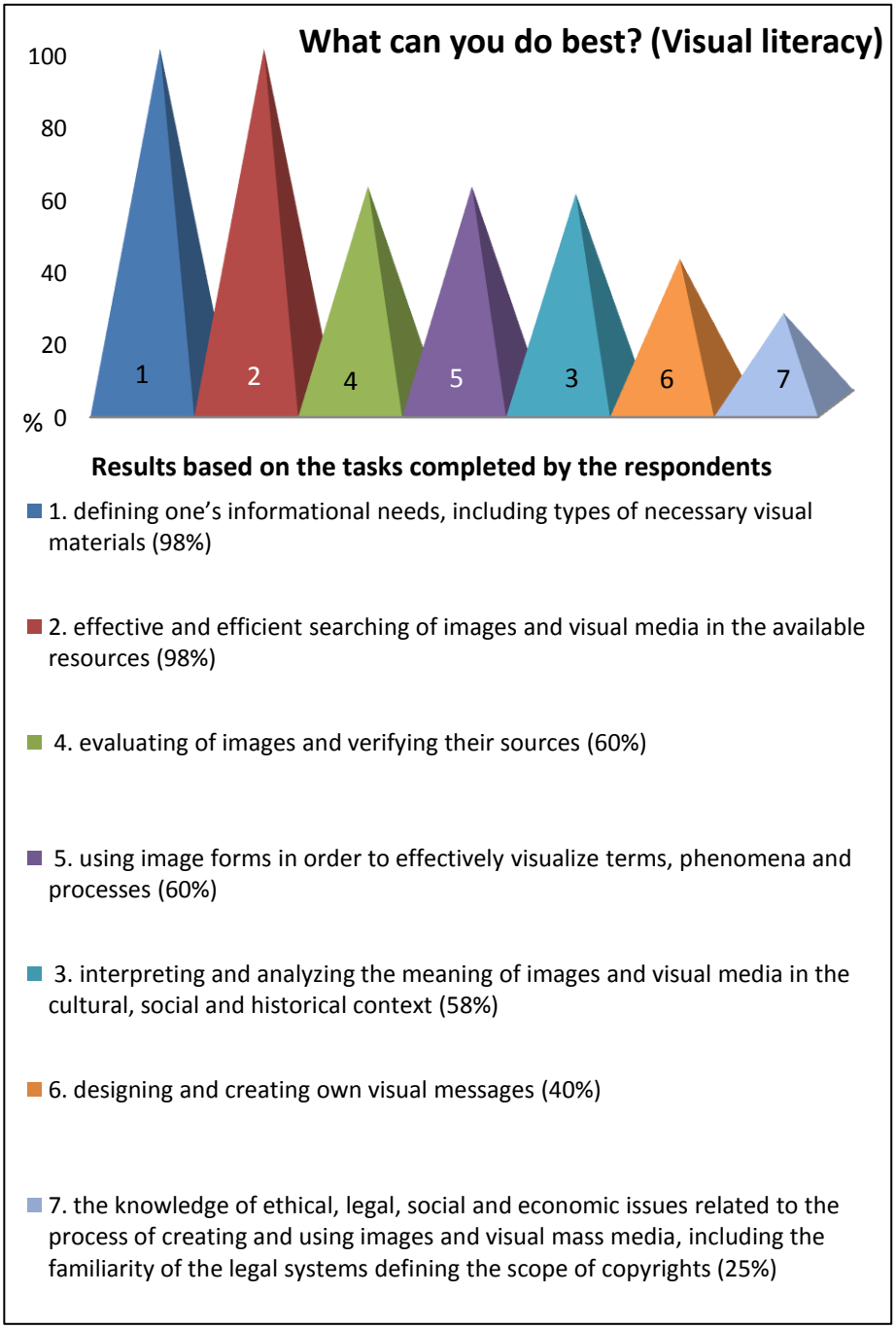

Figure 1. Diagnostic study on *Visual Literacy Competency Standards for Higher Education* (Initial form). Visual competency levels (Visual Literacy Standards No. A)

CONCLUSION

The appearance of the focus group outlined in the study shows individuals treating their visual activities as highly superficial. The recorded activities show a significant number of declarative behaviors rather than competent activities based on solid knowledge aimed at creating an efficient information visual message. Similarly, with respect to creativity, the research shows the activity of the respondents on a mediocre level. One of the most positive features registered in this section of the research is the desire to master and supplement the knowledge on the issues raised by the focal group which conducted a focused reconnaissance of the issues. The need for supplementing this particular area of knowledge brings certain suggestions in relation to strengthening the standards of preparing young people at initial stages of learning.

The fact that the respondents know so little about the rules of acquiring and sharing visual materials, especially copyrighted materials, indicates an immediate need for education. All the more that the activity of the Internet users in relation to "speaking with images" corresponds to lowering the education standards of the society. If we do not take educational steps towards developing visual competences, we may be faced with distorting the cultural message, recreated by generation after generation, filled with new values and meanings, with respect to the evolutionary multicultural society.

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E-LEARNING AS A SUPPORT FOR CZECH POINT SERVICES

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Abstract: *This paper narrows the e-learning support for the public administration services in Czech Republic. There are many contemporary approaches in studying the public administration subjects in Czech universities. One of them, and maybe the most successful, is the e-learning in the form of Learning Management System. E-learning enables students and employees to study online courses with many advantages. The fashion of public administration (eGovernment) naturally calls for online form of study. Firstly, the paper outlines the advantages and the downsides of e-learning. Secondly, it describes the Czech POINT platform and the requirements, which modern learning platform should fulfil to satisfy potential users of eGovernment services. Lastly, it suggests a vision, advantages and a solution for a successful education portal serving public administration employees, students and citizens.*

Keywords: Czech POINT, eGovernment, e-learning, LMS, public administration.

INTRODUCTION

Currently, public administration in the Czech Republic as in many other European countries deals with a huge task of eGovernment implementation (Šperka 2014). This task requests an amount of employees, which could properly manage the changes in day-to-day praxis in offices, mainly, in the citizen-to-state relation. One of the most important parts of eGovernment project in the Czech Republic is a Czech POINT project (CzechPOINT@home 2014), which enables citizen to communicate with the State in one place. The employees should be trained to satisfy the citizen requests and on the other hand the citizen should be informed, which services are to be requested at Czech POINT offices. Here arises the need for a reasonable education platform. We suggest the e-learning form of education to support public administration services and information dissemination.

According to the technical and technological background e-learning could be divided into three groups:

1. CBT - Computer Based Training;
2. WBT - Web Based Training;
3. LMS - Learning Management System.

LMS (Learning Management System) is the ideal group of electronically based education. From the student's viewpoint ~~is~~ the situation is the same as in the case of WBT, which means the online education. Many differences are visible from the tutor's and the course developer's viewpoint. LMS is a special software system, which enables immediate course change by means of the content, the communication between tutors and students, and the communication possibilities among students. LMS is installed on the application server and this ensures the accessibility almost from everywhere with the Internet connection. Important components of LMS are the tools for monitoring the studying progress, and the statistics of example tasks and final tests. In the process of deploying the LMS, the most important substance, is to integrate the LMS into the web portal of the organization.

This paper focuses on the e-learning introduction and the possibility to use LMS as an educational portal for public administration purposes. The paper is structured as follows. In the first section some current e-learning trends will be presented. The second chapter characterizes a brief list of Czech POINT services, which should demonstrate the number of tasks the public administration employees should deal with. The third chapter depicts a suggestion of an educational portal, which might help in educational process in public administration. Lastly, the conclusion summarizes all ideas presented in this paper.

1. E-LEARNING TRENDS

1.1 E-learning advantages and downsides

The advantages of e-learning:

- The access to studying materials anytime from any place.
- Studying materials, supporting sources and books are published on the Internet, so they are accessible almost from everywhere on the 24/7 basis.
- Studying materials are actual every time. The content actualisation is immediate and the process is low-cost.
- Studying progress according to the individual speed. The e-learning courses are organized in a long-time studying period. This ensures students to create their own studying plan, which respects spare time activities and studying habits.
- Lower costs for printing and distribution of studying materials while studying online. Low costs for renting lecture rooms, for accommodation and board.

- The interactivity of courses is higher than in the case of present form. It can be increased with the use of multimedia (audio, video, etc.) and indirectly to support the students' captivation to study regularly and effectively.
- Many possibilities to test obtained knowledge.

The downsides of e-learning:

- The immense creation of studying content. Time dependent process of creation for every specialist. The multimedia studying content is often built with web-oriented technologies or with special program equipment, such as with Flash, Captivate, DrawSWF, CamStudio, etc.
- The accessories dependency. The main downside of e-learning is the dependence on hardware and software equipment of the computer, which operates with e-learning content. But the majority of computers and e-learning environments needs such software equipment which is open-source or free to download and to use, i.e., OpenOffice, Adobe Flash Players, audio and video codecs, etc.
- E-learning form of study is not appropriate for some courses. Especially for the courses, where the human factor is necessary, e.g., for the communication courses.
- E-learning is not suitable for some student groups. Especially for the students, who refuse to operate with information and communication technologies, for disabled students, etc.

1.2 E-learning trends

E-learning like everything in our neighbourhood is changing and developing in a rapid way. The main reason is the development of the information and communication technologies. E-learning is also adopted for the students' assessment, e.g.; polls, examples, tests, etc.

The most common types of e-learning in general are:

- **Blended learning** – a new form of teaching based on the techniques combining the presence form of teaching with e-learning form. This enables to integrate the advantages from both types of teaching, online and traditional. The practical realisation might use the e-learning courses in preparing phase of courses. At this moment it is necessary to keep the e-learning course accessible throughout the whole studying period. It is appropriate to release the materials time-to-time from presence form of teaching into the e-learning form to lower the costs for printing and distribution.
- **M-learning** – indicates the e-learning form of teaching, which disposes with mobile technologies, such as, cell phones, smart phones, tablets, PDAs, etc. This form is dedicated especially to the younger generation of students, which are prone to use all these modern devices. M-learning is limited with technical

parameterization of these devices, which influences the performance and the Internet connectivity possibilities. This handicaps are more and more minimized with the technology improvement.

- **Rapid eLearning** – this form of e-learning is characterized by the short time for the creation of the course, which what is a significant difference between rapid e-learning and the classical e-learning form. Mostly, the lifetime of the studied content is very short.

In the next section some of Czech POINT services will be introduced to explain the need of e-learning in public administration services and to clear the enormous need of education in public administration.

2. A BRIEF LIST OF CZECH POINT SERVICES

According to Czech POINT webpage (2014) - Czech Submission Verification Information National Terminal, a Czech POINT is a project whose aim is to reduce the red tape in relation citizen-public administration. Currently, a citizen must often visit several offices to handle a problem. Czech POINT serves as an assisted place of public administration, enabling communication with the State through one place so that "not citizen, but data should circulate".

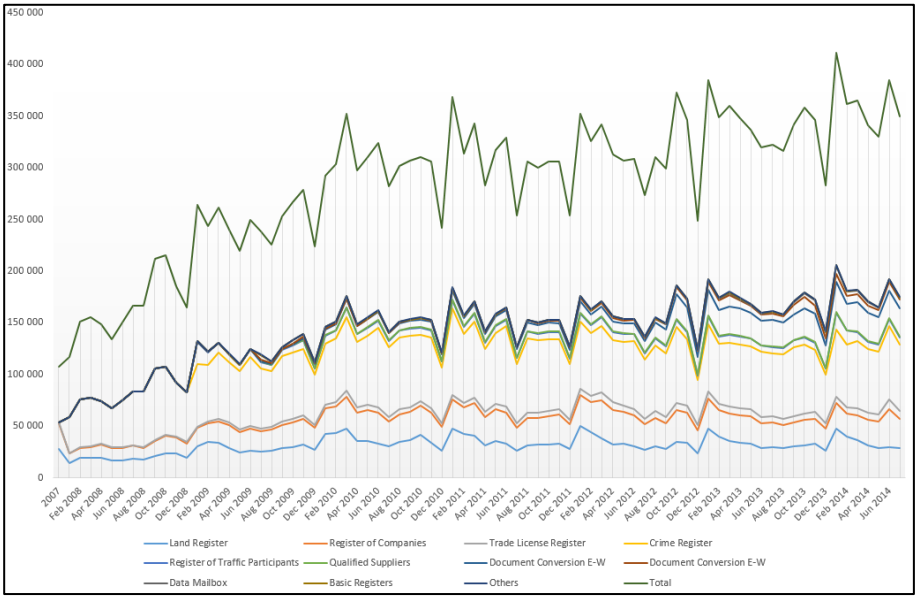

Figure 1. Numbers of Issued Listings – Czech POINT 2007-2014

Source: Own work based on data from http://www.czechpoint.cz/web/?q=node/488

The aim of the project is to create a Czech POINT guaranteed service to communicate with the State through one universal place, where it is possible to obtain and verify data from public and private information systems, certified check of documents and papers, to convert written documents to electronic form and vice versa, to obtain information on the administrative proceedings in relation to the citizen, and to submit filings for initiating proceedings administrations. It is therefore a maximum utilization of data owned by the state so as to minimize demands on citizens (Figure 1).

The Czech POINT project brings significant facilitation of a communication with the state. In some situations citizen should visit only one office. In the final phase of the project the citizen might transact business from home via the Internet.

What offers Czech POINT:

- Excerpt from the Land Register.
- Excerpt from the Register of Companies.
- Excerpt from the Trade License Register.
- Excerpt from the List of Qualified Suppliers.
- Excerpt from the Insolvency Register.
- Excerpt from the Crime Register – natural persons.
- Excerpt from the Crime Register – legal persons.
- Excerpt from the Point Driver's Status.
- Submission according to the Trade Licensing Act.
- Register of Traffic Participants of the Module Car Wreckages ISOH.
- Authorised conversion of documents.
- Excerpts from basic registers, such as excerpt of data from the Register of Inhabitants or excerpt of data from the Register of People.
- Verification of signatures and documents, etc.

Listings you can get at the contact points of a CzechPOINT are primarily intended for the use in Czech Republic. There many services listed under Czech POINT office possibilities. That means the employees should use many connected information systems to obtain requested data. This brings enormous need to teach the employees in order to fulfil all tasks.

In the next section the need for an educational portal in public administration will be introduced with some detailed vision, advantages and proposed solution.

3. E-LEARNING BACKGROUND IN PUBLIC ADMINISTRATION TRENDS

A modern public administration (EEA blog SK/CZ 2014) puts high demands on state employees. It creates the need of a permanent education, absorbing new information (facts, law acts, norms, rules, etc.), habits, and procedures. This brings the same requirements onto the educational system resp. universities. The life-long learning of the employees is substantially supported by the European Union in Czech Republic nowadays. And the financial support is streaming into this area.

An important task of public administration is to provide the citizens and organizations with sufficient information and explanations in a correct form (e.g., in the legislature area, which is complicated and complex). European Union also supports many forms of electronic form of education, communication and dissemination of information. Modern organizations understand the education as a never-ending process, which can be actually adopted to the state of the organization, to the needs, aims, priorities, and different directions. This is why are these systems becoming more important, especially, with the connection to the knowledge management systems, ERP systems, and managerial systems of the organization. The question is how to support an effective and systematic education in public administration.

3.1 Vision

For the education of a good quality we suggest to use an e-learning platform. This e-learning platform should serve as an education portal, which will provide the organizations and universities an educational content, studying courses and tools supporting the educational process. The e-learning platform should be chosen according to high international standards and should be a verified system. This platform could be divided into two parts:

- **Public part** – will serve citizens and will principally provide:
    - publicly available educational content,
    - publicly available studying courses with the possibility to enrol and to obtain a certificate,
    - information.
- **Private part** – will serve the public administration employees (signed in the system) and will provide:
    - studying electronic courses and educational content,
    - catalogue of courses with searching and signing-in options,
    - individual studying plans of employees,
    - tools for watching and updating of the employee profile,

- tools for the tutors to create and to publish the courses and other educational activities,
- community tools,
- tools for monitoring the educational process,
- reporting tools,
- testing and certificating tools,
- tools for the organization and technical maintenance, and source management.

The education portal will ensure the planning, realization and management of all types of educational activities. It will ensure the experience and information sharing among participants across different organizations. The public administration institution will be able to offer its activities, courses (through the catalogue of courses) to other institutions. The education portal will be centralized, but it will ensure simply creation of an own domain for particular institutions. In the frame of own domain the institution might manage and realize the education according to own needs. The portal will enable the institutions and offices to carry out the education systematically and according to their plans. They will get the overview about competencies and knowledge of their employees, and about the actual and future needs. They can plan individual and group activities accordingly. The core is the competence profile of an employee, which describes his knowledge, skills, competencies, and certificates. The career development could be precisely followed and planned through the comparison between the competence profile and the requirements for a specific position, project or a function. The portal also motivates the employee to the self-study. It permits to uncover personal spaces in knowledge and dispose with suitable courses and information.

3.2 Advantages

The development of an education portal in public administration could bring the following advantages:

- Savings through sharing and optimization of sources.
- Planning and evidence. The support for the whole educational process, regardless of the realization form.
- The support for an effective distance learning.
- Maximum exploitation of many standards. A possible use of educational content from different domestic and international vendors.
- Maximum exploitation of sources, e.g., brand-board internet connection, existing information and educational content, workstations, methods, and tutors.

- Support for local activities, decentralization, and distributive approach. It also enables a centralized control.
- Multi-domain approach under one roof. The platform for sharing the information, knowledge, cooperation between institutions. The possibility for unification of procedures.
- Support for the community forming.
- Unified approach to competencies and to the competence profiles in the public administration.
- Support for self-study.
- Possibility to search for the people with specific competencies for particular tasks or projects.
- Effective and clear education planning according to the future needs and sources (missions, projects, legislature changes, etc.).
- Unified access to the information dissemination, and to the lectures and courses.

3.3 Solution

For the development of the education portal we suggest using to use the Learning Management System, such as Moodle. The LMS solves the problematic issues of education on the whole. It ensures to manage the educational process, regardless of the educational form (presence training, distance training, electronic education, or virtual classes). The realization of education (providing of educational content) is a natural substance of such a system. The attention is paid on the independency of content creator, which means we can use different content from different vendors. For this purpose some international standards for educational content were created (QTI, AICC, SCORM, etc.). The certification of the system for basic standards is natural.

The features of a suitable LMS:

- The core is a portal integrated for other systems, configurable according to the organization needs.
- A process-orientation. The LMS supports a successful implementation of educational processes, regardless of a process form.
- The LMS does not prefer one educational form among others. It enables to combine the educational forms. It is possible to combine the forms even in a case of one course.
- Strong support for individual management of education directly for the employee (self-study). Individual use of communication in a community.

- The development and update of educational methods.
- The composition of courses based on different types of educational content, and educational forms.
- The support for cooperation with the content vendors.
- Special support for knowledge tests.
- The support for different communities – educational or technical.
- Skill and competency management.
- Planning of education according to the competence profile.
- Auto-evaluation.
- Multi-domain approach. Enabling to execute more portals on one LMS (e.g., for different institutions, resorts, etc.).
- The management of educational sources (tutors, lecture rooms, workstations, etc.).
- Knowledge management.
- Monitoring, analysis, and reporting.
- Workflow development and role management according to the needs of an institution.
- Integration with ERP, mainly on HR modules and other systems of an organization.
- Certification for international standards.

CONCLUSION

The paper presented e-learning possibilities to overcome the immense loading of issued listings in public administration in the Czech Republic. One of eGovernment areas was introduced, namely Czech POINT services. To ensure the citizen proper services the employees (and students) should be trained in enormous skills, competencies and knowledge concerning public administration services. We suggested using an e-learning platform (LMS) in educational process and to serve the employees, students and citizen. We also proposed a vision, advantages and solution for an education portal, which should represent a sharing platform to streamline the services.

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Note: Author declares that the sent paper to publish in the Monograph is his own original work, which is not printed in other sources in the same form.

SOME RESULTS OF THE RESEARCH CONDUCTED AT THE UNIVERSITY OF SILESIA WITHIN THE FRAMEWORK OF THE INTERNATIONAL RESEARCH NETWORK IRNET

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Abstract: *This article presents a number of results of the research conducted within the European IRNet Project: International Research Network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences. In the research described a tool was used to retrieve data on students' beliefs and expectations about ICT-enhanced learning, and their emerging needs for intercultural development. The expected result was an analysis of the students' views and attitudes towards various educational processes within the scope of their academic study, entailing ICT, intercultural and professional competences.*
The study targets students from Poland and from other partner countries. The retrieved data in the research have allowed to explore the state of the art in ICT-, learning- and intercultural competences. On top of that, cross-cultural analyses will be conducted and will be compared with results, received by partners from other countries. At a later stage of project research (Work Package 2 - Work Package 7 (www.irnet.us.edu.pl) recommendations for Higher Education in the included countries will be formulated.

Keywords: e-learning, international research network IRNet, IT, e-learning and global competences, survey, educational process

INTRODUCTION

Contemporary societies are marked by new global trends - economic, cultural, technological, and environmental shifts that are part of a rapid and uneven wave of globalization. The growing global interdependence that characterizes our time calls for a generation of individuals who can engage in effective global problem solving

and participate simultaneously in local, national, and global civic life. Put simply, preparing our students to participate fully in today's and tomorrow's world demands that we nurture their global competence**.** (Mansilla V. B,. & Jackson A. 2014:)

1. IRNET PROJECT CONCEPT

It is evident that without an active implementation of innovative forms and methods of education, and above all, distance learning at all levels of education these objectives cannot be successfully achieved. At the same time we should identify the existing problem - the fact that e-learning methodology is not yet fully developed and specified, both within the EU and in Ukraine, Russia and Australia. One of the answers to these challenges has been IRNet project. **IRNet -** *International Research Network for study and development of new tools and methods for advanced pedagogical science in the field of ICT instruments, e-learning and intercultural competences.* The project is financed by the European Commission under the 7th Framework Programme, within the Marie Curie Actions International Research Staff Exchange Scheme. Grant Agreement No: PIRSES-GA-2013-612536 Duration of the project: 48 months1/01/2014 – 31/12/2017.

Developing and implementation of a system designed to develop IT competences of contemporary specialists, in particular future teachers, current teachers, leaders, based on the systematic use of selected Internet technologies, such as some LCMS systems (as Moodle), Massive Open Online Courses, "virtual classroom" technology, social media, other selected Web 2.0 and Web 3.0 technology positively contributes to the development of skills in the area of IT and intercultural competences. The IRNet project aims to set up a thematic multidisciplinary joint exchange programme dedicated to research and development of new tools for advanced pedagogical science in the field of ICT instruments, distance learning and intercultural competences in the EU (Poland, the Netherlands, Spain, Portugal, Slovakia) and Third Countries (Australia, Russia, Ukraine). The programme will strengthen the existing collaboration and establish new scientific contacts through mutual secondments of researchers. The main objectives of the project are: 1. to exchange expertise and knowledge in the field of the innovative techniques of education between the EU and Third Countries and suggest effective strategies of implementing new tools in their profession; 2. to analyse and evaluate social, economic, legal conditions, as well as methodologies and e-learning techniques being developed in the European Union and Third Countries involved.

The IRNet project aims to set up a thematic multidisciplinary joint exchange programme dedicated to the development of new tools for advanced pedagogical science in the field of ICT instruments, distance learning and intercultural competences in the EU, Australia, Ukraine and Russia. The programme will strengthen existing collaboration between EU partners, and 2 third country institutions of higher education through mutual secondments of researchers.

A more detailed concept of the project is described in the Project application and on the project web-site (IRNet Project Application, www.irnet.us.edu.pl)

2. THE FIRST STAGE PROJECT RESULTS IN THE FRAMEWORK OF WP2 AND WP3 IMPLEMENTATION

2.1. Research methods and instruments

During our research study the following methods, research techniques and tools have been used: Quantitative methods: 1) pedagogical monograph (research papers), 2) method of individual cases, 3) method of diagnostic survey. Qualitative methods: 1) depth interview, 2) qualitative analysis of the text (documents), 3) observation. Techniques of educational research: 1) observation, 2) interview, 3) questionnaire, 4) study and analysis of documents, 5) content analysis. The main research tools: 1) interview questionnaire, 2) questionnaire, 3) survey, 4) observation tools, 5) development of the subject dictionary, 6) research trip and visiting a partner university, 7) meeting, (video)conference, seminar, workshop, etc.

This paper describes only a part of the research conducted at the University of Silesia in Katowice. The students from different faculties and specializations participated in this research. The University of Silesia conducted the survey at the Faculty of Ethnology and Sciences of Education, among students of the humanistic specialization: Integrated Primary Education and Kindergarten Education, Kindergarten Education with Child's Development Early Support, Social-Cultural Animation with Cultural tourism, Integrated Primary Education and Pedagogical Therapy; in total 105 students took part in the survey, available on . https://el2.us.edu.pl/ankiety/index.php/198896/lang-pl

Generally, within the IRNet Project, more than 1000 students from partner universities (http://www.irnet.us.edu.pl/partners) are scheduled to take part.

2.2.Research Results Analysis

Results of the survey allow for the development of a picture of today's student in the context of educational inquiry, network activities as well as in the framework of intercultural competences development. The analysis of the data obtained at the US shows that contemporary students are active Internet users. The analysis of responses to similar questions, proposed as answers by Polish students, relating to such questions as *Evaluate to what extent you personally use the information available for students on the University (Faculty) website,* gave the following results*: I often learn a lot of new, interesting and important information for myself (48,57%), I rarely use this information. I find important information in other sources (51,43%). The next* question was *What kind information is primarily important for you as a student. What would you like to see on the website of the university (faculty) in the section for students?* The list of expected messages and information is long and varied – ranging *from "Grants for students (information*

about the Erasmus, etc.)" and "About my specialization" to "Information about the absences of teachers (Information about canceled classes)" and "All kinds of information about conferences, rector hours, canceled classes, organized events for students". The analysis of responses to questions related to main kinds and sections of information for students on the University website (faculty) that they consider most important (Multiple-answer questions) shows that the students are interested in the following information: - *employer Information and suggestions for work (66,67%), Invitation to participate in events (conferences, meetings) (60,95%), Gallery and reports from recent events (32,38%), Resources for distant learning and other educational resources (40,00%).* Analysis of responses to questions *"Where do you learn about planned university events and activities most often?" (Single-answer questions)* showed that a kind of a source such as *a University website was chosen by (24,76%) of those surveyed, University page on the social network by (41,90%), Personally from other students – by (26,67%), Personally from teachers – by (6,67%).* What, in your opinion, makes the University (Faculty) website attractive for students? Typical answers include: *Layout & Design (The simple structure), transparency, updating important information, good communication, interesting colors, interesting pictures, useful information, Photo Gallery (Gallery of events), Information on class schedule (information about events), other.*

The analysis of the answers to the question: *How do you use the social networks pages of your university (faculty) (Single-answer questions)?* shows that *12,38% students comment the social network pages of their university, 11,43% - add their content (photos, videos, etc.), Just read and watch - 76,19%. The results of* answers to the question: *What are the main purposes you reflect your activities as a student on your personal pages in social networks (awards, achievement, participation in activities, studies)* (Single-answer questions) are: *Show my achievements to teachers - 18,10%, Show my achievements to other students - 51,43%, Show my achievements to potential employers - 30,48%. The next questions were directed on analyses of an active participant of online communities (groups in social networks) of your university (faculty) (Single-answer questions). The answers were as follows: to actively participate in groups 1-3 (commenting, adding content - photos, videos, links, etc.) - 38,10%, to actively participate in three or more groups (commenting, adding content - photos, videos, links, etc.) - 12,38%, Do not participate or act just as a "spectator" 49,52%.* The next question explored the level of importance, for students, of the teachers' activities on the university site (Department) and the University pages in social networks (Single-answer questions). The students' responses were divided as follows: it is interesting what teachers do - 39,05%, Activity of teachers motivate my activity - 28,57%, Activities of other students are especially important for me - 32,38%.

Several of the questions related to the students' access to Internet and number of hours use the Internet. 100% of the students have access to the Internet (in their homes – 95, in the hostel – 3%, hot-spot connections -2%). How often do you use the Internet: 100% use every day (44,76% - 1 or 2 hours every day, 3-4 hours -

29,52%, 5-7 hours - 20,95%, 8-12 hours - 1,90%, >12 hours - 2,86%. If you have access to the Internet, with what aim do you use it most frequently? (Multiple-answer questions) - to search for course materials, to advance your own knowledge (79,05%), to participate in the e-learning course(s) (41,90%), to contact friends (e-mail, social network, programme messenger) (72,38%), for entertainment (on-line games, free surfing, watching movies) (45,71%), for file sharing (P2P) (15,24%), to develop your interests, passions (42,86%), 1 person declared that they use the Internet for work (Figure 1).

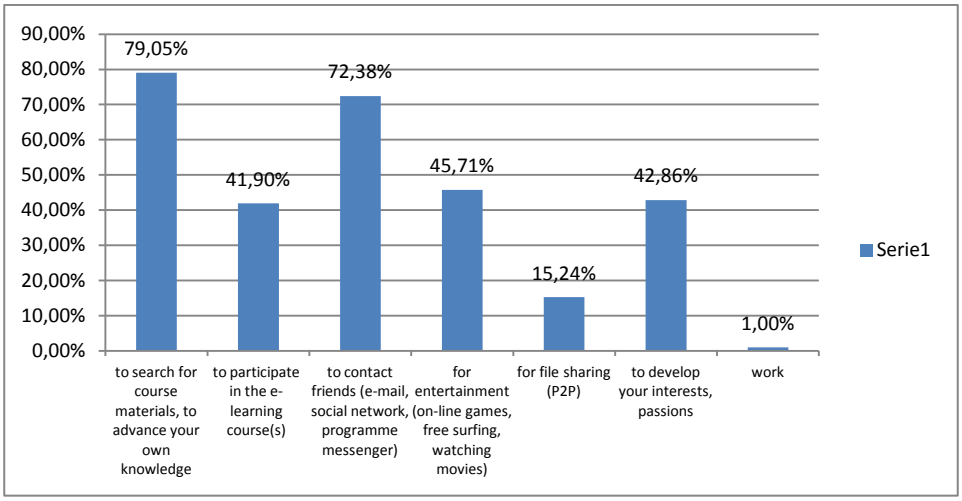

Figure 1. The most common purpose of the use of the Internet by students

Source: own research, 2014

Table 1.

Percentage distribution of answers of students from US in the group of questions aimed at identifying the preferred method for students to obtain information about educational and extra-curricular activities

Question	US
Evaluate to what extent you personally use the information available for students on the University (Faculty) website:	
I often learn a lot of new, interesting and important for myself	48,6%
I rarely use this information. I find important information in other sources.	51,4%
What kind information is primarily important for you as a student? What would you like to see on the website of the university (faculty) in the section for students?	
Curriculum timetables, cancellation of classes, schedule, bulletin board	35%
Events (conference, rector hours, organized events	25%

for students)	
Information and contacts of teachers	17%
International internships, grant, collaboration with foreign partners	4%
Science, competitions	4%
Scholarship	2%
Examination dates, colloquiums	5%
Photos	3%
I don't know	5%
Where do you often learn about planned university events and activities most often:	
University website	24,8%
University page on the social network	41,9%
Personally from other students	26,7%
Personally from teachers	6,7%

Source: own research, 2014

Table 2.

Percentage distribution of answers of students from US in the group of questions aimed at identifying the attractiveness criteria of an information and communication resource for a student as a representative of young consumers and producers of content

Question	**US**
Which sections of information for students on the University website (faculty) do you consider most important?	
Employer information and suggestions for work	66,7%
Invitation to participate in events (conference, contests)	61%
Photo gallery and reports on past events	32,4%
Resources for distant learning and other educational resources	40%
What, in your opinion, makes the University (Faculty) website attractive for students?	
Design and interface	28%
Information, news	41%
Communication	1%
Photographs	15%
Teachers' achievements	2%
I do not know	8%
Add your content (photos, videos, etc.)	3%
Just reading and watching	0%
Transparency	2%

Source: own research, 2014

Table 3.

Percentage distribution of answers of students from US in the group of questions aimed at detecting the level of student communication activity in a virtual environment

Question	US
How do you use the social networks pages of your university (faculty):	
Commenting	12,4%
Add your content (photos, videos, etc.)	11,4%
Just reading and watching	76,2%
What are the main purposes you reflect your activities as a student on your nal pages in social networks (awards, achievement, participation in activities, es):	
Show my achievements to teachers	18,1%
Show my achievements to other students	51,4%
Show my achievements to potential employers	30,5%
Are you an active participant of online communities (groups in social networks) of university (faculty):	
Actively participate in groups 1-3 (commenting, adding content - photos, videos, links, etc.)	38,1%
Actively participate in three or more groups (commenting, adding content - photos, videos, links, etc.)	12,4%
Do not participate or act just as a "spectator"	49,5%

Source: own research, 2014

Table 4.

Percentage distribution of answers of students from US in the group of questions, related to students' attitude towards teachers' activity in the information and communication environment

Question	US
How important for you are your teachers' activities on the university site (Department) and the University of pages in social networks?	
It is interesting what teachers do	39,2%
Activity of teachers motivate my activity	28,6%
Activities of other students are especially important for me	32,2%

Source: own research, 2014

Table 5.

Percentage distribution of answers of students from US in the group of questions reflecting students' educational strategies

Question	US
If you have access to the Internet, with what aim do you use it most frequently?	
To search for course materials, to advance your own knowledge	79,5%
To participate in the e-learning course(s)	41,9%
To contact friends (e-mail, social network, messenger)	72,4%
For entertainment (on-line games, free surfing, watching movies)	45,7%
For file sharing (P2P)	15,2%
To develop your interests, hobbies	42,9%
Looking for interesting materials on the Internet, you use most frequently:	
Search systems, for example, Google	84,8%
Wikipedia	53,3%
Electronic catalogues (bibliographical references and data bases)	21,9%
References to other web sites, placed on the pages	27,6%
Social networks	21,9%
Reliable and well-tested portals	33,3%
Blogs	6,8%

Source: own research, 2014

Table 6.

Students' opinion about most effective submission of final work assignments for checking to the instructor

Questions	US
What methods of transferring the final works for checking to the instructor do you consider the most effective?	
By email	71,4%
By portable (external) means of information storage (for example a flash-memory stick)	23,8%
By means of the distance learning platform, for example the Moodle system or similar ones (Forum, Tasks, etc.)	31,4%
Cloud services	9,5%
Social networks	83,8%
Traditional paper forms (press, photo-copying)	27,6%
Orally during the classes	5,7%

Source: own research, 2014

Table 7.

Students' opinion about the method which they in fact use most often to submit their assignments to the teacher for correction

Questions	US
Which method do you in fact use most often to forward your assignments to the teacher for correction?	
By email	66,7%
By portable (external) means of information storage (for example a flash-memory stick)	31,4%
By means of the distance learning platform, for example the Moodle system or similar ones (Forum, Tasks, etc.)	21,0%
Cloud services	4,8%
Social networks	5,7%
Traditional paper forms (press, photo-copying)	43,8%
Orally during the classes	9,5%

Source: own research, 2014

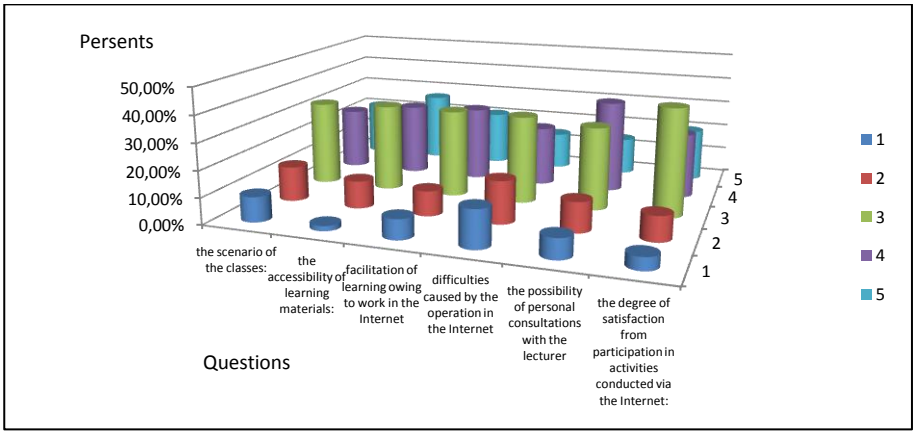

Figure 2. Assessment in the scale of 0-5 where 5 is the top score (the question for students who participate in distance courses)

Source: own research, 2014

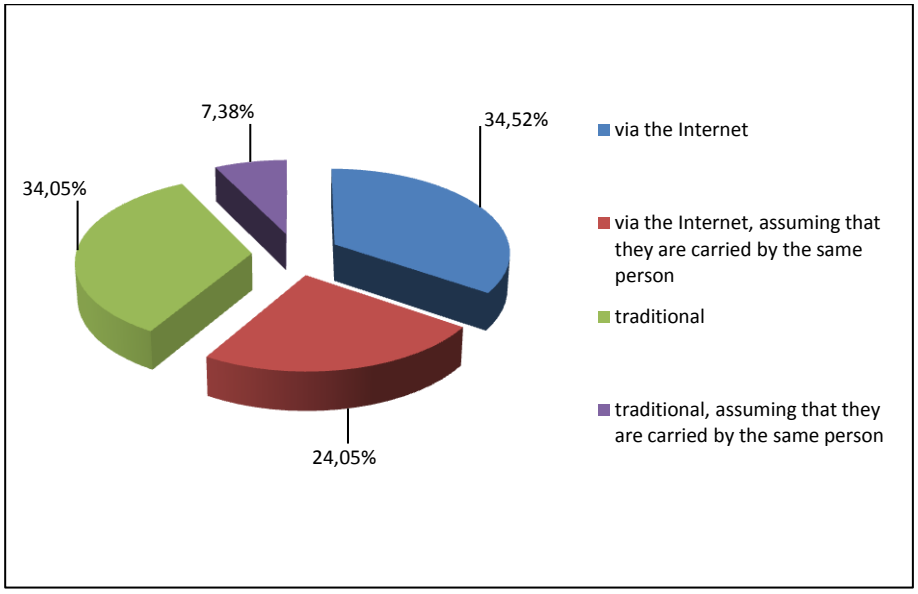

Figure 3. Students' preferences concerning types of classes

Source: own research, 2014

Two questions concerned methods of submitting final work for checking to the instructor that is considered the most **effective.** Answers were as follows: ***by email - 71,43%,*** *by portable (external) means of information storage (for example a flash-memory stick) - 23,81%, by means of the distance learning platform, for example the Moodle system or similar ones (Forum, Tasks, etc.) - 31,43%, cloud services - 9,52%,* ***social networks - 83,81%,*** *traditional paper forms (press, photo-copying) - 27,62%, orally during the classes - 5,71%.*

The answers to the second question "Which method do you in fact use most **often** to submit your assignments to the teacher for correction?", not covered by the answers to the previous question, show the following results - ***66,67%*** *students use email as a method for sending assignments****,*** *by portable (external) means of information storage (for example a flash-memory stick) - 31,43%, by means of the distance learning platform, for example the Moodle system or similar ones (Forum, Tasks, etc.) - 20,95%, cloud services - 4,76%, social networks - 5,71%,* ***traditional paper forms (press, photo-copying) - 43,81%,*** *orally during the classes - 9,52%*

Within the framework of the international project IRNet a questionnaire for academic teachers has been developed, which is conducted at the US as well as in other partner universities for developing a complementary study and comprehensive conclusions concerning students' and teachers' IT competences, their expectation regarding an quality education offer and capabilities, prospects of competitiveness on the labor market and the successful functioning in society of global competence.

CONCLUSIONS

It has been estimated that the e-Learning market in Europe is developing at an annual rate of 30%. This is a significantly higher growth rate than that experienced by traditional university courses, many universities are now heavily committed to developing, and are involved in delivering, e-learning programmes.
The causes of these changes have included moves in the economy, increased global competition, technological change and demographic trends all of which demand flexible and multi-skilled workers. In turn this flexibility, on the part of workers, is viewed by employers as promoting competitiveness, economic growth and guaranteeing employment. (Simmons J. 2006:)
Based on recent research, conducted by the author and collaboration with the project participants drawn up a conceptual framework was drawn up for joint future research. Part of this is described in WP3-WP7 of the IRNet project application and on the Project website. At the same time, the study conducted is being influenced by its own results as they become available, rapid developing of IT technologies - detailed content, methods as well as tools of further research are undergoing changes. Current achievements and conclusions will be presented in the next publications.

Acknowledgments

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II. THEORETICAL AND METHODOLOGICAL ANALYSIS OF DISTANCE LEARNING

BRINGING THE SCHOOL CLOSER TO THE REAL WORLD

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Abstract*: "Mobile Chemistry" is the first textbook designed specifically for the tablets and other mobile devices. This is the textbook of the 21st century. It consists of interactive exercises which allow one to quickly check their knowledge. Instead of filling the gaps, or combining elements by drawing pencil lines, it is enough to drag items using hand or a stylus. It ~~i~~i includes video clips depicting chemical experiences, explaining difficult issues, or showing otherwise unavailable effects in the school environment. Thanks to modern chemical sensors connected to the tablet PASCO students can perform an experiment by themselves. They help students develop their research skills, learn the analytical work as well as the principles of sampling and testing their composition.*

Keywords: mobile learning, e-books, multimedia, tablet, chemistry

INTRODUCTION

On the Titanium Professional company's website, under the title "The first app in the history of the construction chemistry supporting partnership program", you can find the following information:

If only you have a smartphone / iPhone, the partnership program champions Titan mobile app can literally be used at any time. Even if you are not in the range of a wireless internet connection, you still have the opportunity to use some of app's functionalities. In contrast to the so-called mobile websites, with Champions Titan app the user is able to use it even without Internet access. For example you can

browse the prizes' catalogue, read the rules and principles of the program, check the contact details and a list of products covered by the program. (Press Releases 2013)

Could publishing houses involved in the development of textbooks boast with similar offer? On the publishing platforms we can find textbooks packages (unfortunately, usually based on flash technology, which is difficult to use on tablets), exercises (sometimes in an electronic form) and teacher guides (often available online only). Colorful covers lure us with its graphic charm, virtual laboratories encourage to undertake experimental actions and Internet materials inspire independent knowledge and skills testing. Much has been done and many things has been offered to schools and teachers. Time flies and the approach to ways and means of education is changing. And here we are, at a time when colorful exercise books' covers, collections of assignments and tests disappear sequentially from publishing houses' websites, and CD icons, which encouraged to browse CDs full of videos, animations, dynamic models, infographs and educational games are removed from textbooks. Impatiently we are anticipating what is going to appear instead. Textbooks divested of any extras and e-books rich in innovative multimedia solutions or manuals in PDF format for tablets?

At the same time, the American publisher of school textbooks have signed an agreement with ScrollMotion, which is preparing fully interactive, iPad versions of their books. You can search through its texts, check the meaning of a word in a dictionary, browse the galleries illustration or move to the selected pages. It is also possible to play interactive video, text selection, read the text using a speech synthesizer and add notes. Textbooks' publishers see their chance in the iPad (Komputer. World 2014).

Apple introduced a platform for schools containing paid versions of the manuals (in English) and a free application to create them. Interactive, allowing an attractive presentation of the content, textbooks look like they belong to the school of the future, and iBooks Author is considered to be the best tool for teachers since the invention of a textbook. Manuals in iBooks 2 are fully interactive. They have a unified, simple navigation, the content can be easily searched and highlighted and it is possible to take notes and a placement test at the end of chapters. A student may use them in vertical and horizontal mode, and in the vertical mode text will be of more importance and in the horizontal mode - additional materials (Spider'sWeb 2012).

Considering the above, have the new ways to equip tablets present in Polish schools in adapted to them and readily available high-quality books been marked?

1. TEXTBOOK ON TABLETS

Looking for new educational solutions in the technology world, more and more Polish schools accede to the "Textbooks on the Tablet" program As part of this project in 2012, 19 junior high schools in Poland replaced paper manuals with tablet

devices on which application that contains a set of textbooks was installed. Tablets belong to the students - the project is funded by their parents, or in some cases by the local government. In the program public, private and social schools take part. At the very beginning the project required great courage of principals and teachers, but the effort invested the school's preparation for such work repay with students' and parents' growing interest. Participation in the project is voluntary - choice of electronic or paper version of textbook belongs to the parents and students. The cost of electronic textbooks is similar to their paper counterparts. The textbook application can be installed on a device that student owns or on a device purchased in the project. Tablet purchased in the Project remain student's property. (Multiedukacja 2013).

One of the enthusiasts of mobile education, Dariusz Stachecki, writes: Middle School in New Tomyśl develops its own program "Education of the iPad" for the third year. This year we provided another class called "E-class" with iPads mini. Therefore, every day 75 students work in class iPad in the 1:1 system. In addition, we launched a mobile iPad classroom, consisting of 12 units, which is willingly picked up for lessons in all subjects in other classes. As a result, while using the state-of-the-art technology, students can actively participate in interactive lessons. Although we use 19 interactive whiteboards, iPads give each student or a pair of students a chance have their own board, which performs exercises and tasks prepared by teachers using the application, e-books, movies, etc. It definitely increases the pace and dynamics of lessons, makes them more attractive, and student work becomes more efficient and exciting. A new and very important part of the equipping another group of teachers with iPads. Providing each teacher with company iPad allows them to conduct effective and interesting lessons. (Stachecki 2013).

What is actually a mobile device? It can be described as a case of digital tools, which we always have with us. As a result, students can have unlimited access to information resources and teaching aids that they created themselves. According to prof. Elliot Soloway of the University of Michigan (lektor.pl 2012), mobile software developer, mobile teaching:

- creates the possibility to learn at anytime and anywhere;
- has developmental character because the majority of students already owns a cell phone or other more advanced tool and school has to invests only in the software. Another challenge is to create a plan to introduce a mobile education program in curriculum;
- is unique, because it created a completely new possibilities for communication using blogs and communicators.

The technical possibilities, however, are only one aspect of the development of mobile learning. Worthwhile is asking yourself the key question - what exactly school exists for? So far, repeatedly used answer stated that it is an institution

transmitting information to students, but as times have changed, and students develop their knowledge using the Internet and many other sources. What role, then, plays the modern school? Instead of providing information, it should provide students the opportunity to participate in collaborative tasks, in which information is only the basis, not the aim (eSchoolNews 2014).

2. MOBILE CHEMISTRY TEXTBOOK

Intended for middle school students Mobile Chemistry textbook is one of the manual created for mobile devices such as tablets (Gulinska, Bartoszewicz 2014). The manual has been developed for the functionalities of mobile devices, so it is not an electronic version (in PDF format) of the printed manual and it does not refer to traditional solutions, but creates new opportunities for student's interaction in the teaching-learning process. Among many proposals, those listed below deserve special attention:

- wide range of well-illustrated experiments,
- proposals of experiments that can be safely conducted at home,
- films with film tasks, animations and radio broadcasts,
- summaries in the form of infographs, diagram and tables
- educational games, virtual lab project proposals;
- interactive student tasks and mock exam tests.

The textbook refers to the standards of media and Internet information. It enchants its recipient, it draws attention with colourful pictures, interesting news and info graphs which allow to see what remain unseen at first sight. It departs from the linear narrative, in favour of a visual medium, attracting the reader by rich graphical structure, photographs, coloured headings, varied typography and a relatively small amount of a uniformed text. This change is due to the appreciation of visual communication in general and changes in the field of education and psychopedagogy (Gulinska 2014).

Posted in the every topical section of Mobile chemistry textbook proposals the experiences using PASCO sensors will provide teachers with valuable examples of actions with appliance of the package of sensors. Described science and research allow measurements both in stationary conditions on the lessons in the classroom as well as during outdoor activities.

Each of the twelve topical sections includes modules (with a summary of lessons) and summary of knowledge.

Activities available in each module (lesson with summary):

- hypertexts, which after pointing at them shows additional material enriched with photos and illustrations, timelines and tables, which are

valuable supplements to students knowledge through the creation of visual connotations;

- variety - additional information illustrated with photos, views or diagrams;
- movie sequences - showing the course of the experiment;
- interactive tasks and exercises allowing to check the answers.

Activities of the *What have you learned* part*:*

- home laboratory enriched with photo story - describes the experience which can be conducted at home (in the description observations and conclusions are presented);
- exercises allowing to verify the chosen solution;
- film tasks - related to topics of the movies presented in each lesson;
- Radio ChemFM - solving tasks after listening to the news;
- magic numbers - interesting, unusual data presented in tables and graphs;
- our hero – information about the life of an exceptional person related theme of the lesson;

summary in the poem - the most important information included in a poem.

Activities of the *This you have already known* part*:*

- film tasks – filling the gaps in the text after watching the film without commentary
- info graphs associated with the topic;
- tasks based on info graphs
- middle school test - existing database is going to be successively broaden
- educational games including creating picture relations based on associations;
- experience set using sensors PASCO – tasks proposed in textbook are always connected to the part topical part, helping develop students' research skills, teach analytical work, rules of taking samples and examining its composition.

Thanks to the applied technology, students can learn in the most effective way and at their own pace. Interactive way of working allow to adjust the level of difficulty to their capabilities, giving them more or less challenging tasks, depending on their degree of subject's mastery. The difficulty of the material is gradually adjusted to the degree of competence's acquisition, thus avoiding the backlog in the study.

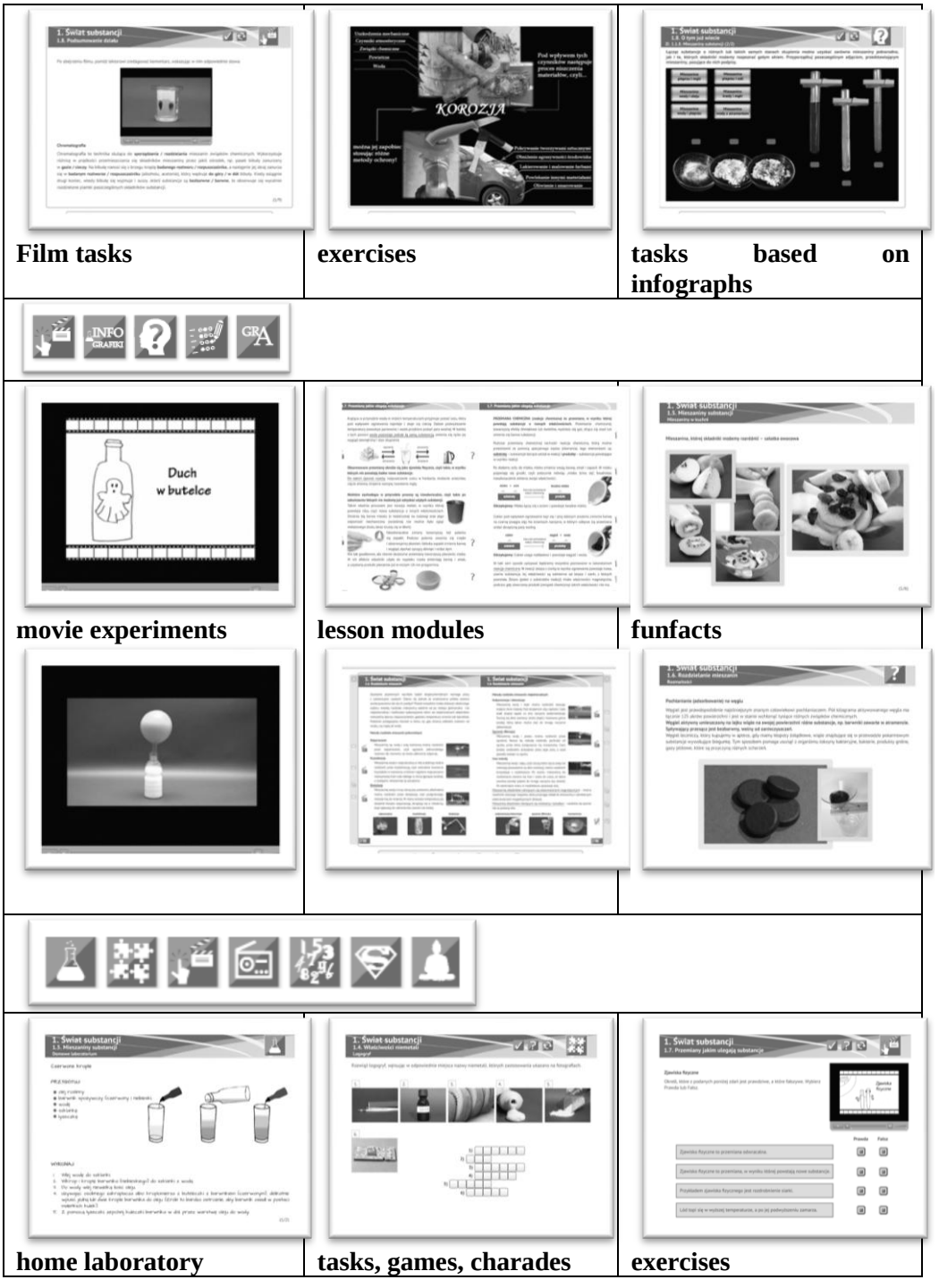

Figure 1. Elements of Mobile chemistry textbook

Source: Author's archive

3. MOBILE LEARNING STRATEGY

It was assumed that working with Mobile Chemistry textbook will be realized on the basis of MASTER learning model developed and tested by John Hattie from the University of Melbourne. MASTER is an acronym for six steps to effective learning: Motivation, Active facts assimilation, Seeking the matter, Training memory, Examining oneself, Reflection.

Method's author performed a meta-analysis of over 500 scientific studies on the effectiveness of different learning strategies, conducted on a group of 200 million students. On this basis, he developed a list of the 10 most effective strategies and learning techniques. All of these can be implemented using digital tools - tablets, computers, interactive whiteboards and educational platform. Thanks to this studies individualized learning proposal becomes feasible (Institute of Modern Education, 2013).

Research on the Mobile chemistry textbook educational effectiveness was launched in June 2014. It is too early then to even talk about specific results. In-depth research on the possibilities of popularization of textbooks for mobile devices will continue in the school year 2014/2015 in selected secondary schools throughout the country. One of the first lessons of this kind was attended by first grade students from 60th Middle School in Poznan.

Figure 2. Students attending middle school in Poznan during the lesson manual

Source: Author's archive

The method of work proposed by the teacher met with interest, and even applause from students who intuitively recognize the functions of each textbook's icon and eagerly joined the actions proposed to them - independently planned and performed experiments and documented its course in the form of videos and photos, individually and collectively solved tasks, exercises and took tests.

Scheduled learning process management systems and online exercises allowed students to quickly verify the progress of each student based on the criteria given to students in advance. Learning at student's own pace meant that the most talented students did not get bored, and those with difficulties got extra time and

support. This method of teaching directly involved students in their own education, using technology and activities which they like.

Surveyed students suggested that they would like to use mobile devices more frequently during their education process. They have a fairly free access to mobile devices and treat the presence of a computer in their pockets as granted, and thus they see the importance of a role that it play in their education. Youth would also like to work on specific projects both at school and at home, as well as play educational games. Besides, they expressed their willingness to use mobile technology to browse the Internet resources, recording lessons and listen to them during their free time. They would also like to receive notifications about homework and quizzes, access the school website and manage some administrative issues in the Internet.

Preliminary results of research conducted by the authors of the Mobile Chemistry textbook are successively transferred to teachers during workshops and conferences. In June 2014 chemistry teachers already had the opportunity to read the textbook and express their opinions on its structure and the possibility of interactive work with students. Subject of workshop: "Chemist – an artist and a mobile teacher" and the opportunity to work with a Mobile Chemistry textbook for iPads met the interest of teachers, what resulted in planning a joint research in the following school year (Gulinska, Bartoszewicz, Krzyśko 2014).

Figure 3. The teachers of chemistry and science at a workshop conducted as part of the 16th School of Chemistry Teaching Problems

Source: Author's archive

The research's results and students' and teachers' feedback as well as the enthusiasm of all those involved in the chemistry class using the tablet, are consistent with the results presented by the Organization of Project Tomorrow, which conducts research project on the use of modern technology in the school among American students for many years. Recently published results of the subsequent stage of research. They show that young people primarily expect from the school a greater access to mobile tools and a wider range of online courses. Analysis of the submitted questionnaires showed that students are a group

very much involved in digital education. They adapt to new technology and create new ways to use it (Andrzejczak 2009).

According to one third of the surveyed graduates, classes conducted in the network are easier to pass, as they allow their participants to ask questions and recall the material contained on the website as many times as they need.

Researchers from Project Tomorrow also gathered students' ideas on how to create the perfect digital textbook. For many of them, the mere prospect of using the paper guide is repulsive and archaic. Youth would like to be able to fit the textbook to their individual needs, eg by applying underlining or adding notes. They would be happy to use specialist's in a particular field help, who could respond to their concerns online, even after school hours.

Both students and parents highly appreciate careers in such fields as natural sciences. Students would like to learn more about career opportunities related to these development trends, especially through meetings with the employees of these industries, apprenticeships, video presentations and movies available on the web. Valuable experience could also be gained by using authentic tools and solving real problems (Andrzejczak 2009).

At the time when Poland is debating over the purchase of laptops for students, and the media ramble on the dangers lurking on the Internet, Americans have already organized the first conferences on the role of mobile learning. Smartphones and other mobile devices became a thing common enough in the student's backpacks that their use in education seems to be a natural consequence. At the same time, in order to consider it as another tool used in education, comprehensive methodological concept of how to adapt modern technology to the school must be created, to get the most out of its benefits. Conference speakers discussed how such methods of work help students achieve better scores in competence tests and improve their skills. Students asked about what would they like to have the most, answer: a laptop / an iPad. The reason is not the uniqueness of these devices, but control over their own knowledge, which they gives them. Similar opportunities are given by a new generation of phones that are much cheaper. Students can use them freely - when and where they want, as if they got reduced in size laptops which fit in the pocket. And importantly, mobile devices are very personalized.

Research conducted in North Carolina have shown that due to the use of smartphones students' math scores improved by 20%. This project, named K-NECT, was started in the school year 2007/2008. Its goal was to improve the mathematical skills of students in ninth grade (in Poland it is 2nd grade of middle school) who did not have access to the Internet at home or it was impeded, came from poor families and the level of mathematical knowledge stood out from their peers. Chosen students receive smart phones with special software and wireless Internet access available at school and at home. This enabled them to use the materials related to lesson's topic and purpose as well as virtual assistants' help if they had trouble understanding the content. The project, which is part of a global initiative to

popularize wireless education, assumed (except for educational purposes) included creating equal educational opportunities for young people coming from difficult backgrounds. Most of the teachers who had the opportunity to work with this method highly valued the fact that this method not only helps improving academic performance, but also develops students' communication skills, which can then be used in the classroom.

CONCLUSION

Teaching with the help of digital textbooks and electronic resources on mobile devices is certainly not free of difficulties that need to be overcome during the wider implementation. First of all, not all the teachers are suited to work using this method. It requires considerable knowledge of how to incorporate science assisted mobile devices to the general curriculum.

The opinion on the potential problems stated Keith Krueger, the head of the Consortium for School Networking: "We often say that technology will solve all the problems in our schools and it is the reason why it ends in failure. (...) You cannot introduce technology into schools, and then build its limitations. It cannot be introduced without knowing what means should be realized. What skills students should possess? How painlessly turn technology into the curriculum? Mobile devices will not solve the school's problems, but may become an inspired help in developing students' creativity. "Research is already underway, pilot schemes are financed. It's not just a fad - it's the future!" (www.eschoolnews.com)

Thinking about introducing new technology to the school we also have to keep in mind negative evaluations, such as: using the textbook on the iPad in most cases will remind struggling with learning or reading a long text on the computer screen. This problem was described a year ago by Nicholas Carr in his famous book "The Shallows. What The Internet Is Doing To Our Brains. "He cited in the study Anne Mangen, Professor Norwegian University of Stavenger, which proves the existence of the relationship between the understanding of the text, as set out in the links. In short, every link and clickable, interactive element included in the text, reduces the chances of its understanding (Boguszewicz 2012, Carr 2011).

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INNOVATIVE EDUCATIONAL TECHNOLOGIES IN BLENDING LEARNING. FUTURE IT PROFESSIONALS IN THE TECHNICAL UNIVERSITIES OF UKRAINE

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Abstract: *This study analyzes opportunities for using innovative educational technologies when training IT professionals at the technical universities of Ukraine. The paper discusses the main trends in the use of innovative educational technologies and cloud technologies in higher technical education, analyzes cloud services used by leading technical universities in Ukraine in management and learning. Consideration is given particularly to e-learning, mobile, and blending learning, virtualization mechanism to support the students learning in the field of natural, mathematical and engineering sciences. The experience of Cherkasy State Technological University in the use of innovative educational technologies and cloud technologies in management and blending learning is presented.*

Keywords: innovative educational technologies, blended learning, cloud technologies, web-oriented computer system, mobile ICT, mobile environment.

INTRODUCTION

With the civilization development the role of computer science and its methods is constantly increasing. The interrelation of computer science into other sciences is getting more significant. Information technologies today are the powerful instrument in finding solutions to difficult problems, which appear in different spheres of human (commercial) activities. The gradual process of computerization of science and production will continue. In connection with it, there appear major alterations in qualifying requirements of future specialists in any sphere, especially in production, economics, finance and management.

Therefore problem investigations, which appear nowadays in computer training of future IT education in higher schools and finding their solution is an urgent social goal.

Ukraine is an emerging free market, with a gross domestic product that has experienced a rapid growth in recent years. Ukraine now has the potential to be one of the region's leaders in volume of foreign direct investment and portfolio investment. Ukrainian Parliament adopted the law "On the Foundations of the Development of Ukrainian Information Society in 2007-2015". The goal of the law is to promote a growth of information society in Ukraine strengthening the basis of IT sector development.

Today Ukraine is one of the leaders among Central and Eastern European countries in the field of IT outsourcing and a number of IT professionals (Exploring Ukraine. IT Outsourcing Industry). Over the last years, the volume of software development and IT outsourcing services has grown by ten times. However, there are problems that lead to the emergence of professionals' deficiency in the IT job market, employers' dissatisfaction with the level of computer student training in the technical universities of Ukraine.

One way for increasing the quality level in computer science training for future IT specialists today is the use of innovative educational technologies, particularly blended learning.

The article considers the current state of IT education in Ukraine, the problems of higher technical education in Ukraine which train professionals for the IT industry, as well as some solutions to these problems through an extensive use of innovative educational technologies at the technical universities of Ukraine.

1. IT EDUCATION IN UKRAINE

Universities in Ukraine have the potential for the efficient implementation of tasks in innovative economic development: providing qualified personnel and the creation of new knowledge. In Ukraine in 2013-2014 the training of staff is performed by 823 higher educational institutions, including universities, academies and institutes (334) (40%). Over 2.17 million students are enrolled in higher educational institutions, among them 1.824.900 students (84%) are enrolled in universities, academies and institutes (Key indicators of higher education in Ukraine at the beginning of the school year 2013/14).

Ukraine's higher education tops the ranking in Eastern Europe. Ukraine occupies the 25th position out of 48 evaluated countries. Czech Republic, Poland, Slovenia, Russia and Slovakia are placed at the 26th, 27th, 28th, 32nd, and 35th positions respectively. The researchers ascertained the United States of America, Sweden, Canada, Finland and Denmark to be the top five countries in the overall education rating. Eastern European countries (Ukraine, Czech Republic, Poland, and Slovenia) were in a cluster in the middle range of the list. The data was examined according to 20 different criteria to find the best countries at providing higher education. All the criteria were combined into four main groups: resources, output, connectivity and environment.

Ukraine has a long standing reputation as a major technology region, with a well-developed scientific and educational base. With only 1% of all world population, Ukraine accounts for 6% of the world's physicists, mathematicians, computer programmers, and other highly educated professionals.

More than 16,000 IT specialists with a Bachelor's degree and about 14,000 IT specialists with a Master's degree graduate from universities every year.

To bridge the gap between classical education and real business and technical process, outsourcing companies have partnered with leading universities to offer additional classes and labs for students. In Table 2 there is a list of top-five universities in Ukraine in terms of training of IT-professionals.

Table 1.

Top-five universities in Ukraine in Terms of Training IT-professionals

Place in rating	University
1	National Technical University of Ukraine "Kyiv Polytechnic Institute", Kyiv
2	Kyiv National Taras Shevchenko University, Kyiv
3	National Technical University "Kharkiv Polytechnic Institute", Kharkiv
4	National University "Lviv Polytechnic", Lviv
4	Kharkiv National University of Radio Electronics, Kharkiv
5	National Aviation University, Kyiv
5	National University "Kyivo-Mohylanska Academy", Kyiv
5	State University of Information and Communication Technologies, Kyiv
5	Oles Gonchar National University in Dnepropetrovsk

Source: Tryus, Cahala, 2013

The most popular IT jobs in Ukraine include:

- web developers (PHP);
- programmers .Net;
- programmers Java;
- QA (Quality Assurance);
- programmers C / C + +;
- developers of mobile applications;
- web designers;
- developers and database administrators;

- specialists in automation systems (ERP, CRM, BI).

The minimum requirements that employers require from technical universities with IT majors include: fundamental basic knowledge of Mathematics and Physics; knowledge and possession of programming languages C/C++/Pascal in the scope of university programs; knowledge of the database theory; English language (reading); basic knowledge of HTML, Java Script; practical experience in the IT industry (6 months and more); an overview of the software development process.

At the same time the representatives of IT companies would like students to have initial experience in the IT industry, pursue independent studies; carry out their IT projects; and nonprofit IT projects; participation in freelance IT projects; visit free training; have many interviews with prospective employers.

The abovementioned information makes it clear that the representatives of IT companies see no prospects for gaining initial experience in IT students at the university where they are studying.

According to the authors one of the reasons for this paradoxical situation is the poor representation of Ukrainian universities in the Web space that results in the low positions of Ukraine's universities in the prestigious world ranking – Ranking Web of Universities (http://www.webometrics.info/en/Europe/Ukraine), especially for peripheral universities (Tryus, Cahala, 2013).

Another reason why employers are not satisfied with the preparation of IT professionals in Universities of Ukraine is that technology in this area is changing rapidly: new special development tools and problem-oriented software is rapidly evolving with the hardware to provide computer technology and networks. In this situation the universities with limited financial resources are not able to respond to these changes to upgrade computers, network equipment, to buy new licensed software, to develop teaching resources and new disciplines for professionally-oriented training needed to teach future IT professionals (Tryus, Cahala, 2013).

What is necessary to be done by universities in Ukraine in order to prepare IT professionals to change the situation in the regional technical universities?

Answer: To use the innovative educational technologies in the training of IT professionals at the technical universities of Ukraine.

The main approaches in the use of innovative educational technologies are considered in the training IT professionals at the technical universities of Ukraine**.**

2. INNOVATIVE EDUCATIONAL TECHNOLOGIES IN TRAINING

Real ways to improve the quality of IT professionals in the technical universities, to enhance the learning, cognitive and research activities of students, to reveal their creative potential, to increase the role of independent and individual work, to increase their competitiveness in the IT labour market are:

1. *Development and implementation in the educational process of the innovative learning technologies*, on the basis of the organic combination of traditional and computer-oriented forms, methods and means of education, including among others: e-learning, technologies of mobile and blended learning; information educational environment and the community; educational services and Web 2.0; cloud computing.

2. *Collaboration of Technical Universities with IT companies*. Creation of the educational and research centers and centers of certification leading IT companies of the world: Microsoft, CISCO, Hewlett Packard, Intel and Oracle.

3. By the *innovative ICT technologies of learning* we mean the new and original technologies (methods, tools, ways) of creation, transmission and storage of teaching materials and other information resources for educational purposes, as well as technology of organization and support of the teaching process (traditional learning, e-learning, mobile and blended learning) using telecommunications and computer networks that deliberately, systematically and consistently are implemented in educational practice (Tryus 2012).

According to the authors, such methods of teaching in technical Universities, that mostly are used in the preparation of IT professionals, include: web-oriented specialized software; mobile ICT learning; mobile learning environment.

Let's consider these innovative learning technologies in detail (Tryus, Gerasimenko 2012, Tryus 2012, Slovak, Semerikov, Tryus 2011, Rashevskaya 2013, Tryus, Cahala 2013, Tryus, Yatsko 2013).

2.1 Blended learning as an innovative educational technology in higher education

The fast development of information technologies makes changes in almost all spheres of human activities, and education takes one of the first places among them to introduce innovations on the basis of information communicative technologies.

The notion of online training is attached fast in students' minds today. The internet becomes largely an educational space, which provides modern students with better opportunities of getting to informational database and of teamwork. New educational approaches like distance learning, electronic learning, mobile learning, online learning and blended learning are developing fast. But specialists suggest exactly blended learning is one of the most perspective innovative trend in higher education.

In the research work (Tryus, Gerasimenko 2012) the concept of blended learning process is analyzed in details. Therefore we will give here only some basic principles, of which the use of the blended learning approach in authors' professional activity consists.

Blended learning is aimed first of all at learning and professional requirements of every participant of the learning process while in the traditional learning system a

general knowledge level is expected from all students present in class. A lesson has got an only usual scheme, individual qualifications are mostly not taken into account whereas the blended learning system provides everyone with the opportunity to choose the rate of mastering as well as priorities in learning by themselves. Blended learning is useful for those students, who due to different circumstances cannot be present during the lectures in their higher education course (because of health problems, family matters, occasional employment or permanent work, especially in the case of senior, graduate students) and for those, whose profession demands regular business trips and missions, that cause means durable absence from the town, where the higher school is.

In the principles of blended learning the learning process includes job-retraining and qualification raising of specialists and studying to get a post-graduate degree. So graduates, who have got a bachelor's degree, can get a master's degree in the field they work, without discontinuing work. Learning programs like these are widely used in German and British universities. In several European countries universities offer some modules which are taught simultaneously in traditional way for present in class students and for distant ones so they won't feel left alone. Blended learning gives opportunities to students to go on learning at universities in European countries.

In contemporary educational literature sources you may find different explanations to the concept of blended learning (Collis 2001, Heinze 2013).

According to one of them, *«blended learning is a purposive process of getting knowledge, experience and skills. It is learning methods for education and personality development, obtaining creative abilities by complex and systematic application of the traditional and innovative pedagogical technologies and informative-communicative learning technologies to complement one another with the aim to get the better quality of education»* (Tryus, Gerasimenko 2012).

We will use it in the context of our study.

As it is mentioned above, the tendency in organization of the educational process in higher school develops toward blended learning process, which combines traditional as well as computerized methods, forms and means in its organization.

As a rule, blended learning consists of following stages (Tryus, Gerasimenko 2012):

- individual students' work on the theoretical material using distance, electronic and mobile technologies;
- learning practical skills in the form of traditional class lessons using innovative pedagogical technologies;
- discussing difficulties on the internet in an online or off-line mode using distance, electronic and mobile technologies;

- monitoring and executing control as well as scoring students' educational achievements using computerized test programs, especially doing a computer test;
- execution of a final test in discipline (examination test) and presentation of student's qualification project in a traditional full-time form.

Blended learning model is a type of using informational educational resources in traditional learning with applying of the elements of asynchronous and simultaneous distant and mobile learning. Blended learning in higher school is recommended as a part of traditional learning in class lessons. The aim of blended learning is to combine the advantages of traditional and distant learning and to reduce their defects.

The main problem in the introduction of blended learning in higher school is the low rate of self-management and self-control of learning students. If they are too low, the learning material won't be learned well enough and will influence the education quality. Therefore purposive work on the development of the student's self-educated skills and getting knowledge, making them communicative and cooperative in teamwork are not less important aims in the learning process and forming their informative and communicative competences.

For the realization of blended learning process technology in higher school computerized learning systems are mostly used. One of the most widespread systems of this type is Moodle (Modular Object Oriented Distance Learning Environment) (Website learning management system Moodle, Smirnova-Trybulska 2007).

Here we observe an example of electronic learning in higher school, in which one of the authors participated.

2.2 Web-oriented specialized software

Due to an extensive use of the Internet and its resources in higher education institutions, including technology Web 2.0 in the educational process, freely distributed software for electronic, blended and mobile teaching, web-oriented specialized software, there is an actual problem of creating a web-oriented methodical complexes of natural and mathematical courses. One of the ways to solve this problem is to use the web-oriented versions of mathematical software (*Matlab Web Server*, *webMathematica*, *wxMaxima*) and their integration with each other and with other software.

The example of such integration is *SAGE* (Software for Algebra and Geometry Experimentation) (www.sagemath.org). It is the open source system for performing symbolic, algebraic and numerical calculations and graphical constructions in which interface is written in a powerful programming language Python, and that integrates with both commercial SCM (Maple, Mathematica, Matlab), and open source SCM (Skilab, Maxima, Octave, etc.). In addition, SAGE can integrate with e-learning

systems (e.g., Moodle), which is very important for creating the web-oriented educational and scientific information environments and web-oriented methodical systems of teaching of mathematical subjects.

The innovative web-oriented ICT for teaching natural and mathematical courses include the system *Wolfram|Alpha* – a computational knowledge engine (CKE). Wolfram|Alpha (www.wolframalpha.com) is based on the processing of a natural language (currently – English), to a vast library of algorithms and NKS (New Kind of Science) – the approach to finding answers to queries. Wolfram | Alpha does not return a list of links, based on the results of the query and calculates the answer based on its own knowledge base, which contains information about mathematics, computer science, physics, astronomy, chemistry, biology, medicine, history, geography, politics, music, cinematography, and information about famous people and websites.

2.3 Mobile ICT learning

Among the existing ICT and teaching methods the most favorable to the realization of higher mathematics under the blended model are mobile information and communication technologies.

Mobile information and communication technology learning are considered as a set of mobile hardware and software, and system methods and forms of use of such principles in the teaching process in order to get, storage, processing and playback of audio, video, text, graphics and multimedia data in operative communication with global and local resources (Slovak, Semerikov, Tryus 2011).

The introduction of mobile ICT into the methodical systems of teaching mathematical and computer sciences at the university changes all its components, but to the greatest extent it changes the technological subsystem of methodical teaching (principles, methods of teaching forms). The leading teaching methods of mathematical disciplines are mobile means of general and special purpose: hardware (mobile phones, smart phones, e-books, notebooks and net books, PCs, tablets, etc.) and software (mobile system to support learning, mobile educational software, feedback communication system, mobile systems of computer algebra and dynamic geometry).

As mobile mathematical software of learning of higher mathematics the new system *MathPiper*, which integrates computer algebra system *Yacas* and dynamic geometry system *GeoGebra*.

2.4 Mobile environments

Today, an opportunity of teaching anywhere and at anytime is a general trend of intensification of life in the information society. Such opportunity is provided mostly using the so-called mobile teaching – the new method of teaching, which is based on the intensive use of modern principles and mobile technologies (Slovak, Semerikov, Tryus 2011).

Mobile learning is a new educational paradigm and on its base a new teaching environment is being created, where students can access teaching materials at anytime and anywhere, making the teaching process more appealing, democratic and it promotes students to self-teaching and training throughout life.

Mobile environment (ME) can be defined as an open modular mobile network information-computing software that provides users (teachers, students) with mobile access to information resources and educational purposes, creating conditions for the effective organization of the educational process and the integration of classroom and extracurricular work. The main components of ME are computational kernel, information and methodological support (lecture demonstrations, presentations, and other educational materials in electronic form, accessible, dynamic mathematical models, educational expert systems) and network server.

Technical universities in Ukraine have some experience in creating mobile mathematical environments (MME) used in teaching students of higher mathematics and other mathematical disciplines. The main criteria for selecting Mathematical software for the computational kernel MME are: scalability (the system should permit the user to supplement it to solve new classes of problems); availability of various interfaces and support for web-services (for mobile access); cross-platform (mobility software); the ability to create applications with standard controls (lecture demonstrations, dynamic models, simulators, educational expert systems); the ability to integrate with a variety of software (based on open APIs); support for Wiki; the possibility of localization and free distribution. In particular, the SAGE that satisfies almost all of the following requirements can be used in the way of the computational kernel MME.

3. THE MAIN TRENDS IN CLOUD COMPUTING APPLICATION IN UKRAINE'S TECHNICAL UNIVERSITIES

In the document The NIST Definition of Cloud Computing the National Institute of Standards and Technologies (NIST) it is pointed out that Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics (On-demand self-service, Broad network access, Resource pooling, Rapid elasticity, Measured service), three service models (SaaS - Software as a Service, PaaS - Platform as a Service), IaaS - Infrastructure as a Service), and four deployment models (Private cloud, Public cloud, Hybrid cloud, Community cloud).

In work (Tony Shan 2009) are considered a taxonomy to classify a variety of XaaS (Anything as a Service) offerings, which extends the traditional SaaS, IaaS, and PaaS areas (Figure 1).

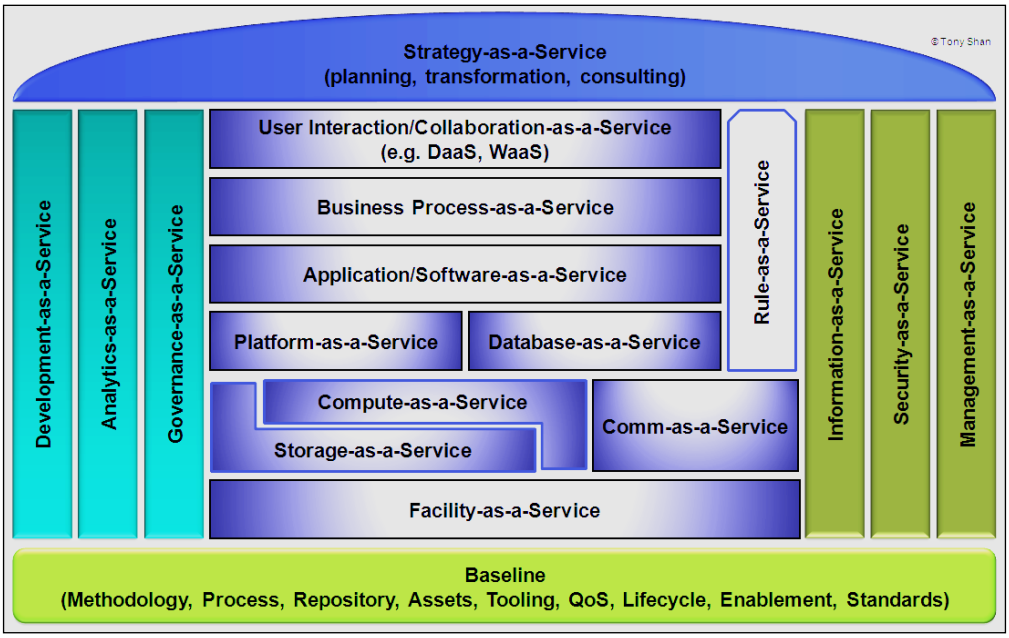

Figure 1. Cloud Taxonomy and Ontology

Source: Tony Shan, 2009

The cloud computing distinguishes from the previous models (distributed computing, grid computing) first of all with the principle of computing power, rent of necessary software, hardware or the provision of the entire infrastructure as a service on Internet. Table 2 provides an overview of cloud providers whose services Ukraine's universities use the most (Seidametova 2012).

Table 2.

Cloud Providers (Vendors) Overview

#	Provider (vendor)	Cloud service Model	#	Provider (vendor)	Cloud service Model
1	Google Apps Engine	SaaS	6	Oracle	PaaS/SaaS
2	Microsoft Azure Services Platform	IaaS / PaaS	7	IBM	IaaS / SaaS
3	Amazon Web Services	IaaS / PaaS	8	Cisco	IaaS
4	VMware	IaaS	9	GoGrid	IaaS
5	Rackspace	IaaS / PaaS	10	Salesforce	IaaS/PaaS/SaaS

Source: Seidametova, 2012

Application of cloud computing in university education gives the opportunity for higher education organizations to use computing resources and software applications on Internet as a service, allows intensifying and improving the learning.

Today there is no alternative for collaborating on text documents, electronic worksheets, presentations, data stores, files and synchronization. Table 3 provides a list of vendors of cloud offices and services, which are to some extent used by universities of Ukraine.

Table 3.

Vendors of cloud offices and services

Vendor	IBM Docs	Google Docs	Office Online (previously Office Web Apps)	Zoho Docs
Sait	greenhouse.lotus.com	docs.google.com	office.microsoft.com/ru-ru/web-apps onedrive.live.com	www.zoho.com/docs

Source: Seidametova, 2012

Examples of the most popular modern services in Ukraine based on cloud computing for education are the Live@edu, Microsoft's (https://login.live.com) and Google Apps Education Edition (http://www.google.com/enterprise/apps/education).

A list of cloud services Windows Live from Microsoft includes: *Windows Live Mail, Windows Live SkyDrive, Windows Live Messenger, Windows Live for Mobile, Windows Live Alerts, Office Online (previously Office Web Apps)*.

Office Online is an online office suite offered by Microsoft which allows users to create and edit files using lightweight, web browser based versions of Microsoft Office applications: Word, Excel, PowerPoint, and OneNote. The offering also includes Outlook.com, People, Calendar and OneDrive, all of which are accessible from a unified app switcher.

Google develops and provides a range of applications and services which are accessible from any page in a browser (Mozilla Firefox, Google Chrome, Opera, Internet Explorer etc.) when connected to the Internet. In our opinion, the most frequently used Google Apps for Ukrainian academia are the following: *Google Calendar, Google Docs, Gmail, Google Knol, Google Maps, Google Sites, Google Translate, YouTube*.

In the above mentioned list of services Google Apps plays a special role. It is a service provided by Google to use its domain name to work with Google services. Domain name registration is possible through a registrator authorized by Google. Google Apps has free basic and professional packages. Google Apps Education Edition is developed for educational purposes and is a free package for educational

organizations including all the opportunities of professional package (http://www.google.com/intx/uk/enterprise/apps/ education/products.html).

This gives a university the opportunity to use cloud services described below:

- cost saving for student mail server managing and keeping; as there is no need for keeping a high disk space server, protecting against spam and viruses, thereby reducing the expenditures for support staff;
- increasing data and information resources accessibility; creating of mailing group for notifying on the conferences, changes in the schedule, graduates mixes, administrative events;
- competitive advantage offering maximum of the possible services to students; educational organizations create a competitive advantage over others that limit the student by basic services;
- supporting community graduates and establishing relations with them with minimal efforts and money.

The usage of cloud solutions enable universities to deploy mobile resources such as e-learning systems, digital libraries, and expand resources for research, web portals, information systems, OLE system, provide hosting services.

Applications that a university uses are integrated into the infrastructure of the cloud provider. The University must pay attention to the standardization and automation of deployment and service updating in provider infrastructure; take account of billing procedures.

Thus, for the cloud technologies deployment and usage in universities it is necessary to consider the peculiarities of the cloud architecture and specific categories of users, and also rebuild management infrastructure and university procedures of operational management according to cloud technologies.

Flexibility and dynamism of the cloud infrastructure enables universities to combine reasonably the usage of peaks and slumps of workplace load and minimize operating costs.

Let’s consider some examples of cloud technologies possibly used at Ukrainian technical universities.

3.1. e-learning & blending learning

The modern projects of e-learning and blending learning are using the virtualization process and such concepts as «Elastic infrastructure», «Partitioning of Shared Resources», and «Pooling Compute Resources».

Currently there are a number of specialized solutions for e-learning and blending learning, for example, *Moodle*, *Blackboard*, *Google OpenClass*, *Canvas*, *Piazza*, *eFront*, *ILIAS*, *Claroline*, *Sakai*, *OpenSIS* and other. Some of them are services that are as an Student Information System (SIS) (like solution with open-codes

OpenSIS), other are system of LMS (LCMS) (Moodle, Canvas, ILIAS, Claroline, Piazza), and others integrate components of both systems (OpenClass). In Ukraine, the most common is the LCMS Moodle (moodle.org).

The example of the new generation online learning systems is the joint product of companies Pearson and Google called OpenClass (http://www.joinopenclass.com). OpenClass combines elements of LMS and social networks. The users can run this product from Google Apps. The beta version of OpenClass is implemented. Many universities test this beta version, including the universities of Ukraine, for example Crimean Engineering and Pedagogical University (Seidametova 2012).

On the one hand, e-learning system is an effective educational technology which allows to replace some traditional learning programs, reduce learning costs, and intensify the learning. On the other hand, online learning creates a lot of its own problems.

So, there is a new problem of higher education*: the most successful universities will be able to attract millions of students from all over the world; weak universities will lose students and they can't withstand the online projects of strongest universities*.

3.2. Teachers and students training at open courses of world leading universities

The most popular and successful online learning projects using the advantages of cloud computing is massive open courses (*Massive online-Open Course* – MOOC) offered by projects *Coursera* (https://www.coursera.org), *MIT OpenCourseWare* (http://ocw.mit.edu/index.html), *Stanford Online* (http://online.stanford.edu/course), *Udacity* (http://www.udacity.com), and *edX* (https://www.edx.org).

Project Udacity was created for education democratization and improving the training on computer science. Courses are offered as video lectures based on integrated tests, homework; there are also video conferences, forums in the format of «student-teacher», «student-student». As a pedagogical concept the model «learning by doing» is used. The assignments for each lecture are intended to help students to understand the concept and ideas presented during the lessons.

Coursera Project offers free online courses of leading American universities. Courses include lecture notes, homework assignments, tests, and exam questions. Unlike the project Udacity, Coursera project offers courses not only at computer science but other courses including «economics, finance and business», «mathematics and statistics», «society, network and information», «public and social science, health, medicine, and biology».

EdX offers interactive online classes and MOOCs from the world's best universities. Online courses from MITx, HarvardX, BerkeleyX, UTx and many other universities. Topics include biology, business, chemistry, computer science, economics, finance, electronics, engineering, food and nutrition, history, humanities, law, literature,

math, medicine, music, philosophy, physics, science, statistics and more. EdX is a non-profit online initiative created by founding partners Harvard and MIT.

MIT OpenCourseWare is a web-based publication of virtually all MIT course content. OCW is open and available to the world and is a permanent MIT activity. For higher engineering education courses in electrical engineering, systems engineering, computer science, engineering and economy (total 2150 courses) would be useful.

Stanford Online offers a variety of professional education opportunities in conjunction with many of the University's schools and departments. Stanford Online also offers an array of free online courses (including some engineering disciplines and computer science) taught by Stanford faculty to lifelong learners worldwide.

The main goals for teachers of Ukrainian universities during training on MOOC are: to use methods of MOOC for improvement of traditional and distance learning, qualification improvement, improvement of existing and development of new educational courses on the basis of the obtained knowledge and experience.

3.3 IT professional certification programs

Gap between knowledge that a student gets in a higher school and the actual need of economy in highly qualified professionals is one of the main problems of higher education in Ukraine. Certification programs are popular now at helping contemporary specialists (graduates, students) to improve their skills and knowledge required in the work practice. Certification enables IT specialists and students to acquire up-to-date and needed skills at the job market that are of value for employers, as well as to improve the level of their professional capabilities.

To provide services on a competitive level the modern specialist must know the latest technologies. They must be well trained to achieve this. Modern information technologies are developing so fast that it is quite difficult for professionals to remain competent and qualified enough specialist without specialized training.

Professional certification enables IT professionals to complete training and receive formal confirmation of their knowledge and skills of the latest ICT. The most recognized certification system now is a so-called international IT certification which allows to obtain a certificate from a vendor/manufacturer of a product. For many years the leaders at this field are hardware, software, networking and telecommunications equipment, etc. manufacturing companies (Microsoft, Google, HP, Cisco, Oracle, IBM and others).

Cloud technologies have opened entirely new opportunities for self-education and knowledge and skills improvement for students and graduates of IT specialties. Certification programs provide unlimited technical possibilities for the instructors of ICT disciplines to improve students and professionals skills.

In that context certification programs are one of the actual ways to obtain the necessary knowledge and skills in the field of cloud technologies, which are

currently being offered by leading cloud providers including Microsoft, IBM, HP, Google, Cisco, VMware, and others.

3.4 Using cloud technology at teaching mathematical, natural, and professional courses

Examination of the experience of ICT using in IT students higher math teaching in the US has provided an opportunity for scientists of the Kryvyi Rig National University (Rashevskaya 2013) to affirm that now development stage of the higher engineering school leading medium at IT students higher mathematics learning are online ICT and cloud services of general purpose (learning management system, allocation of open learning materials system, communication and collaboration facilities) and special purpose tools (computer mathematics web-system: *webMathematica*, *WolframAlpha*, *MapleNet*, *SAGE*, *vxMaxima*, mathematical editors, trainers, training web-expert systems) which are an integral part of the *mobile mathematical environment* (Slovak, Semerikov, Tryus 2011). Different models of ICT and cloud technologies usage at IT students higher mathematics studying are being implemented at the Ukrainian technical universities, particularly at CSTU.

For teaching IT students at CSTU and other Ukraine's universities free cloud environment are used for program development in different programming languages (*C, C++, Html, Java, JavaScript, Pascal, Perl, PHP, Python, Ruby, SQL, Visual basic, Scheme*). They include the following browser programming system: Scratch.mit.edu, PascalABC.NET, IDEOne.com, CodePad.org, CollabEdit.com, editor.condex.net/pythonv3, TouchDevelop.com.

The virtualization technology provides big opportunities for training students in computer majors, work with operating systems and computer networks in real time. This advantage is used in the teaching of such courses as «Operating systems», «System programming», «Parallel and distributed computing», «Computer networks», «Information Security». There are a specific virtual environment and the necessary software for various disciplines. Use of cloud technology at higher mathematics and other mathematical, natural and professional courses teaching for IT students majors allows to reach the high mobility level of students and teachers. The textbooks content together with other electronic educational resources, support facilities of mathematical and professional activities are carried in the web environment which substantially expands the range of ICT tools that can be used for training.

There is a new form of training – mass open distance learning courses (MOOC). The leading forms of the training organization are cloud oriented lectures, practical and laboratory classes.

4. EXPERIENCE OF CSTU ACCORDING TO THE IMPLEMENTATION OF INNOVATIVE TEACHING TECHNOLOGIES

Cherkasy State Technological University (CSTU), where the authors work, is one of the leading state educational establishments in Ukraine providing the country with highly qualified specialists. Throughout its more than 50-years-old existence CSTU has proved to be a well-known outstanding regional institution due to its achievements in educational and scientific fields.

Our graduates are a new generation professionals ready to organize an effective production under market economy conditions on the basis of modern technologies. At present CSTU has the necessary scientific and material basis to broaden the field of research in different directions currently important for both, Cherkasy region and Ukraine.

CSTU is a typical representative of the Regional Technical University of Ukraine, which prepares future IT professionals. So it has all the problems stated above in this activity. Here are some practical steps for the university to solve them.

1. The E-learning system of CSTU based on system Moodle 2.5.4 is designed and implemented for the realization of the blended model of learning, improvement of traditional teaching, conducting ~~of~~ various types of controlled teaching activities of students, as well as for testing of created distance courses. About 120 teachers have been trained for the use of distance learning technologies. They have created more than 250 distance courses.

The E-learning System of CSTU is intended for supporting the learning process of full-time, distance and external students, for management of their individual work and for monitoring and executing control and assessment of students' educational achievements in automated mode. The E-Learning System of CSTU is integrated with the electronic university library.

E-Learning System of CSTU is made accessible to all students and teacher staff and administration of the higher school according to the rights of access to the information resources and its subsystems.

For the successful software support, monitoring and assessment of blended learning in E-Learning System of CSTU is created with its full elements structure. It includes course structure, course scheduling, course curriculum, initial control, course modules, accounting-graphic and projects database, final test and general knowledge assessment tasks. Each module has its organization structure of the course.

Learning process organization in e-learning system is connected with individual task completion, examination, computerized questionnaire, discussions on Internet forums and chat.

The qualification project (Tryus 2012) describes in details the system e-learning in higher school on the basis of Moodle and its peculiarities in use for all types of education in learning process management.

2. The University received free license program of the IT Academy Microsoft (software package DreamSpark) for the software from Microsoft. The University makes extensive use of open source system and problem-oriented software, cloud technology to the educational process in the computer field. At CSTU Information Technologies and Systems Faculty cloud-oriented IT infrastructure with use of Google and Microsoft Office 365 services is being implemented.

3. In January 2013 the Memorandum about the establishment of Research and Teaching Center of HP was signed between the HP Company and CSTU. Today there are 25 such centers in the leading universities of Europe.

4. The Test Center on the basis of Certiport company was created in cooperation with HP in CSTU. This center has trained 30 teachers on the program HP ATA (Accredited Technical Associate), which provides training and certification of IT professionals in 4 areas: Networks; Server & Storage; Connected Devices; Cloud. Besides, CSTU professors who teach computer courses study at courses provided with Coursera, Udacity, EdX projects. Note that every year approximately 20% of the Information Technologies and Systems Chair of CSTU graduates are trained in Microsoft Virtual Academy, HP Accredited Technical Associate, other educational programs and get certificates.

5. The graduates of computer specialties of University take 70% of positions in the leading IT companies throughout the region. They joined the students to develop the real IT projects and startups, some of which have already received international recognition.

6. In CSTU the "IT job Fair" is regularly held for students of computer specialties in which the leading IT companies of the region under Ukrainian Hi-Tech Initiative can participate. The results of the "IT job Fair" demonstrate that many students get the motivation for teaching and mastering the future profession, and about 20% of participating students find places of their future jobs. In addition, the University resolve the teaching programs of professionally-oriented courses of computer specialties in order to fill them with new content.

7. In Cherkasy State Technological University regularly organized International Scientific-Practical Conference "Information Technologies in Education, Science and Technology" (ITEST) (website of the ITEST: itont-2014.cdtu.edu.ua). The conference purpose is to stimulate the research in the field of information-communication technologies (ICT), definition of perspective ICT directions application in science, education and technique, exchange of scientific information and practical achievements in this field, establishment of closer relations between universities and scientific institutions of different countries, encouraging young people to scientific research. Co-organizers of these conference are: Educational and Scientific Complex "Institute for Applied Systems Analysis" NTUU "KPI",

Institute of Information technology and methods of learning NAPS Ukraine, International Research and Training Centre for Information Technologies and Systems Academy of Sciences of Ukraine and Ministry of Education, Science of Ukraine, Eastern Washington University (USA), University of Silesia in Katowice (Poland), Space Research and Technology Institute Bulgarian Academy of Sciences BAS (Bulgaria).

8. During last years Ukrainian universities including CSTU actively do research at using cloud technologies in education, including engineering education. In 2012 a joint research laboratory on the use of cloud technologies in education in Kryvyi Rig National University and Institute of Information Technologies and Training Means of NAPSU (http://cc.ktu.edu.ua) was established. Video is available on http://www.ustream.tv/channel/cc-seminar. The results of this work are discussed at scholarly conferences and seminars held at different levels including The International Workshop «Cloud Technologies in Education'2013» (CTE2013) (website of the seminar: http://tmn.ccjournals.eu/index.php/cte/2013). Presentation of reports on the seminar is available on the website http://cc.ktu.edu.ua/?p=163. Co-organizers of these seminars are: Institute of Information Technologies and Learning Tools of the NAPS of Ukraine, Kryvyi Rih National University, Cherkasy State Technological University, National Technical University "Kharkiv Polytechnic Institute", Taras Shevchenko National University of Luhansk, Kherson State University, Eastern Washington University. The best reports will be published in the electronic journal «Information technologies and teaching facilities» – scientific reviewed electronic edition, providing information to readers and is available at: http://journal.iitta.gov.ua.

CONCLUSION

1. The activity of technical Universities that train future IT professionals should focus on the organization of the educational process through innovative educational and informative and communicative technologies, the use of which can ensure the creation of a single educational and scientific informative environment in the University in which teaching activity of students will be a specific model of their future careers in the conditions of information society.
2. The rapid spread of cloud computing sets the task of integrating cloud services in the management system of educational institutions, changing their IT infrastructure, and implementation of innovative technologies in education.
3. Modern Internet technologies do not only change the world around us, but also actively allow the introduction of innovation in education. This does not only change the form, but also contents and methods of education. As a result of these Internet innovations we can intensify the motivation of students for new knowledge, enhance the process of teaching and learning, as well as influence and improve the overall quality of education.

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AN ANALYSIS OF THE EFFECTIVENESS AND QUALITY OF E-LEARNING IN MEDICAL EDUCATION

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Abstract**:** *Technology advancement has a major impact on the prevailing education methods and ways to present knowledge. More and more frequently, blended learning or even e-learning methods are implemented along with traditional education. On the other hand, rapid changes in medical sciences involve the need to continuously extend and update the teaching contents. All this contributes to seeking an optimized and efficient method of imparting knowledge in medical education on academic level, to maximize the learning results without imposing excessive load on the teaching staff. Comparison of learning effects and student satisfaction is the primary method of checking whether the implemented changes in learning methods and context bring positive results.This article presents an evaluation of methods of measuring learning efficiency and quality on the basis of classes held in selected medical subjects at the Faculty of Health Sciences of the Medical University of Bialystok and the results of the implementation of an electronic examination at the Faculty of Medicine, Department of Pathophysiology, The Poznan University of Medical Sciences. Efficiency of traditional education was compared to that of distance learning, involving the use of an e-learning portal implemented for research purposes. The results of research on e-examination may constitute the basis for a discussion concerning electronic knowledge evaluation in medical education and an example implementation for those medical schools that are now commencing e-testing.*

Keywords: e-learning , distance education, effectiveness of e-learning, quality of e-learning, e-examination, e-test, Standard QTI

INTRODUCTION

Academic education, in its adaptation to technological and social advancements, takes up more and newer forms and methods. The learning contents delivered to students are further enriched with multimedia elements, such as interactive presentations, videos, audio recordings, animations and computer games (Roszak, Kołodziejczak, Ren-Kurc, Kowalewski, 2013: 350-358; Roszak, Kołodziejczak, Ren-Kurc, Kowalewski, Bręborowicz, 2013: 42-45). The traditional class organization method is often replaced or supplemented with distance learning involving the use of the Internet.

Continuous development of multimedia communication techniques, data exchange systems, intelligent learning systems, free e-learning portals (LMS/LCMS) and tools for creating e-learning courses lead to perception of on-line education as the factor encouraging students' interest in this form of education.

The university education system, offering studies at medical faculties (medicine, dentistry), faculties of pharmacy, medical analytics, biotechnology and health sciences (fields of study: nursing, obstetrics, physiotherapy, medical emergency services, dietetics, radiology) requires learners to master information regarding issues from multiple medicine-related areas. With this wealth of knowledge, its acquisition becomes more efficient when it is communicated using modern communication methods, across a broad time interval. A traditional lecture or seminar does not offer such options, while an LMS/LCMS-class e-learning portal meets these requirements.

A professional e-learning course with the right choice of interactive elements and parts for testing knowledge of the teaching content (Roszak, Kołodziejczak, Kowalewski, Ren-Kurc, 2013a), will accelerate and improve the efficiency of the learning process. Characteristics of medical faculties require students to master a lot of practical skills that cannot be replaced with the e-learning format of class (e.g. therapeutic massage, childbirth, blood collection, injections, resuscitation, etc.); however, theoretical background in the field can be successfully conveyed during a distance class (Półjanowicz, Latosiewicz, Niewiński, Milewski 2009; Półjanowicz, Latosiewicz, Kulesza–Brończyk, Piekut, Kalisz, Piechocka, Terlikowski 2010; Półjanowicz, Citko 2008).

1. EDUCATION EFFICIENCY AND QUALITY

Efficiency is an important aspect of assessing the quality of education. Education quality consists of the professional and methodological contents of learning materials as well as the consistency of learning goals with the adopted learning

model: traditional, or e-learning. For the on-line model, the technical aspect of the IT solutions is important (reliability, functionality, user friendliness of the e-learning system). Learning efficiency means the degree of achievement of the anticipated learning goals. Learning efficiency can also be presented as improvement of operating effects with regard to the given issue. Learning effects consist of the following elements:

- knowledge acquisition - this is the volume of knowledge acquired per unit of time compared to the entire volume of acquired knowledge;
- proficiency in new contents - measured across an entire spectrum of various tests, checks, forum posts and educational games (Bramley 2011).

A traditional process of teaching medical students consists of several essential components: theory presentation (lectures, seminars), practical classes, specialization classes (clinical), internships. Some components of this education process can be easily replaced with the e-learning formula and as a result, a transparent and comprehensible e-learning course should facilitate the traditional teaching process.

1.1 E-learning quality

The prevailing model in university students' e-learning research is the e-course model (Mischke, Stanisławska 2006), which offers selected subjects in an electronic version available in the form of learning materials. Research on e-course quality should consist of the following parts:

- measurements of learning materials (in terms of subject-matter contents, logical structure, understanding);
- e-students' needs arising from lack of direct contact with the teacher (discussion forums, chat rooms, videoconferencing);
- needs for synchronous learning process implementation;
- studies in terms of methodology applied to the learning goals set (learning through acquisition - lecture, working with a book, learning through discovery - case method, marketplace of ideas, learning games, learning through experience (video, demonstration, art), learning through action (case method, simulations, activities);
- studying e-course organization methods;
- research of students' own activity (students' logging activity in the e-learning portal, time dedicated to knowledge acquisition, students' activities in the specific modules; the latter can be used to determine course complexity;
- research of learning process evaluation, including the system of hints, recommendations on the adequacy of proposed solutions, mentoring (Mischke, Stanisławska 2006).

1.2 Effectiveness of e-learning

Verification of e-learning efficiency in the Kirkpatrick model should include:

- assessment of students' satisfaction through a system of evaluation surveys - this is the reaction level of the model;
- assessment of knowledge acquisition ratio among students through a system of verification tests - learning level of the model;
- assessment of students' attitudes and behaviors, evaluation of efficiency improvements through observation and analysis of deliverables - behavior level of the model;
- assessment of financial outcomes of the project (return on investment in education) - results level of the model (Kirkpatrick 2001; Dąbrowski 2008).

Summing up, the issues of evaluating quality and efficiency of e-learning can be presented in two interdependent aspects: evaluation of the quality of e-class preparation, and comparison of traditional learning with e-learning.

2. E-LEARNING SURVEY BASED ON THE EXAMPLE OF SELECTED MEDICAL SUBJECTS

The survey was conducted among the students of the Bialystok Medical University, at the Faculty of Health Sciences, first- and second-cycle full-time studies. The publication presents an analysis of learning results in full-time first-cycle studies in subjects ending with an exam.

With two subjects prepared according to the e-course formula, the students were divided into two groups for each of these subjects. The first group of 237 members (53%) followed the course syllabus according to the traditional learning model (control group). The second group of 209 members (47%) completed e-courses in an e-learning portal (study group). The survey covered a total of 446 students in the 3rd year of their first-cycle (bachelor), full-time studies (Table 1).

Objectivity, comparability, as well as regularity (one-semester intervals) and interdisciplinary research quality were the indispensable elements of the measurements. The data analysis process covered results from various fields of knowledge, such as: obstetrics, gynecology, gynecological and obstetric nursing and therapeutic massage. The Bioethical Committee of the Bialystok Medical University approved of the research project (Resolution no. R-I-002/338/2009).

After the end of each e-course, a survey was conducted with evaluation questionnaires, covering elements of e-learning quality and efficiency evaluation referred to in chapters 1.1 and 1.2. The questionnaire consisted of three parts: sociodemographic data, students' opinions about the completed classes, and students'

opinion about learning effectiveness. Final exams in the particular subjects were conducted in both groups using the traditional method, i.e. single-choice tests.

Table 1.

Number of first-cycle full-time students during the particular academic years covered by the research project during 2009-2012

Program / Course	Method	Number of students in each group in the subsequent years of teaching			Sums of rows
		2009/2010	2010/2011	2011/2012	
Physiotherapy	e-learning	17	33	44	94
Therapeutic massage	traditional	59	31	43	133
Nursery I st.	e–learning	43	25	47	115
Obstetrics, gynecology and gynecological and obstetric nursing	traditional	40	23	41	104
	TOTAL:	**159**	**112**	**175**	**446**

Source: Own work

The exam results in the study group and the control group were compared, including the grades received by students in final exams and the degree of their satisfaction with the classes. The survey results were statistically analyzed using relevant two-tailed tests: Chi-square test, exact Fisher test and Mann-Whitney test. Calculations were carried out at statistical significance $\alpha=0.05$ in STATISTICA v. 10.0 (StatSoft. Inc.).

3. RESULTS AND DISCUSSION

When pursuing the above specified e-learning efficiency measurement strategy, similar final exam results were achieved in both the studied groups, with slightly

higher average grades in the e-learning groups. The differences between the studied averages were not statistically significant ($p > 0.05$). A summary of results is presented in Table 2.

The results may indicate that professionally developed and adequate learning materials published in an e-learning portal, together with their continuous accessibility, allowed students from the study group to acquire and consolidate knowledge a bit more effectively than students taking part in traditional classes.

Table 2.

Average exam grades in the particular academic years 2009–2012

Academic year	Parametr / Group	n	Mean	SD	Min	Q_1	Me	Q_3	Max	Mode	p value
2009/2010	Study	60	**3.54**	0.54	2	3	3.5	4	4.5	4	0.174
	Control	99	**3.63**	0.59	2	3.5	4	4	4.5	4	
2010/2011	Study	58	**4.29**	0.62	3	3.86	4.5	5	5	5	0.30
	Control	54	**4.08**	0.60	3	3.5	4	4.5	5	4	
2011/2012	Study	91	**3.75**	0.59	3	3	4	4	5	4	0.168
	Control	84	**3.65**	0.60	2	3	4	4	4.5	4	

Source: Own work

Figure 1 presents the distribution of grades (in academic scale: 2 – 5) received from final exams in the study group and the control group during academic years 2009–2012. Statistical analysis did not show any statistically significant differences in the distribution of grades between the compared groups ($p > 0.05$).

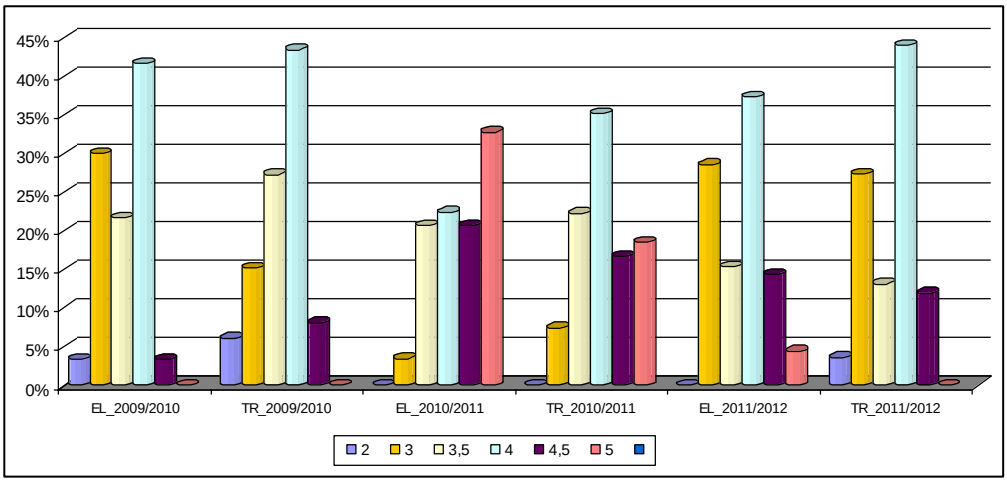

Figure 1. Distribution of grades (as a percentage) received from final exams by students taking part in the research project during the academic years 2009–2012

Source: Own work

In order to evaluate satisfaction with the classes, students' answers to questions ın the survey concerning their opinion about the classes were reviewed in each of the studied groups (e-learning and traditional).

The answer to the question: "Were the classes well organized?" was "Definitely yes" or "I think so" for the majority of the students (86.1%), while only 6.5% of them answered "Not really" or "Definitely not". The answer "Don't know" ("Neither") was given by 7.4% of respondents. These percentages illustrate the results obtained jointly in both the student groups during the academic years 2009-2012, which were covered by the research project. The distribution of answers given by students, divided by subject and group during the particular academic years is presented in Table 3.

Table 3.

Evaluation of class organization for subjects ending with an exam during the particular academic years

Academic year	Course	Parametr / Group	n	Definitely not (1)	Not really (2)	Don't know (Neither) (3)	I think so (4)	Definitely yes (5)	p value
2009/2010	Thera-peutic massage	Study	17	0	1 5.9%	0	13 76.5%	3 17.6%	0.306

2010/2011	Obstetrics, gynecology and gynecological and obstetric nursing	Control	59	0	1 1.7%	4 6.8%	35 59.3%	19 32.2%	0.335
		Study	43	0	2 4.7%	2 4.7%	25 58.1%	14 32.6%	
	Therapeutic massage	Control	40	1 2.5%	0	5 12.5%	21 52.5%	13 32.5%	0.085
		Study	33	0	0	1 3%	18 54.5%	14 42.4%	
2011/2012	Obstetrics, gynecology and gynecological and obstetric nursing	Control	31	2 6.5%	4 12.9%	2 6.5%	15 48.4%	8 25.8%	0.314
		Study	25	0	2 8%	2 8%	16 64%	5 20%	
	Therapeutic massage	Control	23	0	3 13%	6 26.1%	11 47.8%	3 13%	0.776
		Study	44	1 2.3%	5 11.4%	3 6.8%	24 54.5%	11 25%	
	Obstetrics, gynecology and gynecological and obstetric nursing	Control	43	1 2.3%	2 4.7%	3 7%	28 65.1%	9 20.9%	0.636
		Study	47	0	0	1 2.1%	31 66%	15 31.9%	
		Control	41	0	1 2.4%	2 4.9%	26 63.4%	12 29.3%	

Source: Own work

A significant majority (88.9%) students answered "Definitely yes" or "I think so" to the following question in the survey: "Were the learning contents well prepared for the class, available and helpful?", while only 5.3% of the students answered "Not really" or "Definitely not". The answer "Don't know" ("Neither") was given by 5.8% of the respondents. Like in the previous question, these percentages illustrate the results obtained jointly in both groups during the academic years 2009-2012, which were covered by the research project. The distribution of answers given by students, divided by subject and group during the particular academic years is presented in Table 4.

Table 4.

Quality of preparation, availability and helpfulness of learning contents according to students, in subjects ending with an exam during the particular academic years

Academicyear	Course	Parametr / Group	n	Definitely not (1)	Not really (2)	Don't know (Neither) (3)	I think so (4)	Definitely yes (5)	p value
2009/2010	Therapeutic massage	Study	17	0	0	1 5.9%	9 52.9%	7 41.2%	0.844
		Control	59	2 3.4%	2 3.4%	5 8.5%	28 47.5%	22 37.3%	
	Obstetrics, gynecology and gynecological and obstetric nursing	Study	43	0	1 2.3%	0	24 55.8%	18 41.9%	0.480
		Control	40	0	1 2.5%	2 5%	19 47.5%	18 45%	
2010/2011	Therapeutic massage	Study	33	0	0	2 6.1%	15 45.5%	16 48.5%	0.473
		Control	31	0	2 6.5%	2 6.5%	15 48.4%	12 38.7%	

2011/2012	Obstetrics, gynecology and gynecological and obstetric nursing	Study	25	0	0	0	20 80%	5 20%	**0.015**
		Control	23	0	3 13%	5 21.7%	12 52.2%	3 13%	
	Therapeutic massage	Study	44	0	5 11.4%	1 2.3%	14 31.8%	24 54.5%	**0.002**
		Control	43	0	5 11.6%	3 7%	28 65.1%	7 16.3%	
	Obstetrics, gynecology and gynecological and obstetric nursing	Study	47	0	0	1 2.1%	26 55.3%	20 42.6%	0.105
		Control	41	0	4 9.8%	2 4.9%	23 56.1%	12 29.3%	

Source: Own work

The answers to the question: "Has the syllabus covered during the course enriched your knowledge and skills?" were positive ("Definitely yes" or "I think so") for the majority of the students (90.5%), while only 3.7% of them answered "Not really" or "Definitely not". The answer "Don't know" ("Neither") was given by 5.8% of respondents. Table 5 presents the distribution of answers given by students, divided by subject and group during the particular academic years.

Table 5.

Students' opinions regarding expansion of their individual knowledge and skills

Academic year	Course	Parametr / Group	n	Definitely not (1)	Not really (2)	Don't know (Neither) (3)	I think so (4)	Definitely yes (5)	p value

2009/2010	Therapeutic massage	Study	17	0	0	1 5.9%	7 41.2%	9 52.9%	0.683
		Control	59	0	1 1.7%	2 3.4%	17 28.8%	39 66.1%	
	Obstetrics, gynecology and gynecological and obstetric nursing	Study	43	0	0	1 2.3%	24 55.8%	18 41.9%	0.470
		Control	40	0	1 2.5%	2 5%	17 42.5%	20 50%	
2010/2011	Therapeutic massage	Study	33	0	0	0	17 51.5%	16 48.5%	**0.039**
		Control	31	0	3 9.7%	4 12.9%	12 38.7%	12 38.7%	
	Obstetrics, gynecology and gynecological and obstetric nursing	Study	25	0	1 4%	1 4%	13 52%	10 40%	0.062
		Control	23	0	4 17.4 %	4 17.4%	12 52.2%	3 13%	
2011/2012	Therapeutic massage	Study	44	1 2.3 %	2 4.5%	3 6.8%	16 36.4%	22 50%	0.659
		Control	43	0	1 2.3%	2 4.7%	21 48.8%	19 44.2%	
	Obstetrics, gynecology and gynecological and obstetric nursing	Study	47	0	0	1 2.1	22 46.8%	24 51.1%	0.170
		Control	41	0	0	2 4.9%	26 63.4%	13 31.7%	

Source: Own work

The students' positive opinions about the classes indicate high professional quality of the courses. High popularity of e-courses may have its roots in the diversity of forms of knowledge presentation (classes, SCORM activity) and activities available in the course (quiz, assignment, forum). Each student may review the contents they should master multiple times, thus acquiring them more effectively. In addition, they can use quizzes to see for themselves how proficient they are in the given field (Półjanowicz, Latosiewicz, Niewiński, Milewski 2009; Półjanowicz,

Latosiewicz, Kulesza–Brończyk, Piekut, Kalisz, Piechocka, Terlikowski 2010).

The results obtained lead to the conclusion that distance learning may offer a highly successful addition to traditional classes. It would be justified to continue the research and to analyze e-learning efficiency and quality at universities, particularly in the context of expanding the educational offer at medical faculties, increasing the number of students, and high workload imposed on teaching staff.

4. E-EXAMS IN PATHOPHYSIOLOGY AT THE POZNAN UNIVERSITY OF MEDICAL SCIENCES

Electronic knowledge evaluation via an e-learning portal was first implemented at The Poznan University of Medical Sciences in 2009. It was a part of pilot implementation of an OLAT e-learning portal at the Department of Pathophysiology. It was the outcome of work of an inter-institutional team of experts in the field of distance learning from Poznan universities. Implementation of the electronic examination system was possible due to a research grant (Grant No. 504-07-02232378-34205-08956 of Poznań City and Inter Grant No. 501-03-02232378-08956, the website of the grant: http://old.amp.edu.pl/_nowa/pol/index.php?department=38).

The exam in the portal was taken by 45 Polish-language students of the second year of Medicine. A similar exam in pathophysiology was taken by 40 English-speaking students of the second year Doctor of Medicine Program in 2010. A database of 200 test questions was created. The exams consisted of 30 randomly picked questions for each student, which had to be answered in a limited time. The exams took place in the University's computer rooms. The tests consisted of multiple-choice questions and gap questions (calculating a given value on the basis of problem analysis) in 4 topical areas. After the end of the test, every student received information about their results: score, and whether or not the test was passed. After the exam, the students were to fill in a questionnaire in the portal regarding the exam organization and form.

All students had access to the portal before the exam. The contents published in the portal included trial tests with single and multiple-choice questions with multimedia elements (static images, videos), true/false questions, and completion tasks. This allowed students to find out the electronic examination capabilities offered by QTI (Question and Test Interoperability) and exam parameterization dimensioning in terms of time, number of test launches, different formats of presentation of results and ways to present questions and answers (Roszak M., Kołodziejczak B., Kowalewski W., Ren-Kurc A., 2013a).

Discussion forums were also created in the portal for each group of students separately. They were used to exchange remarks about the tests and the exam procedure. After the exams, the students' general remarks gathered during individual

interviews or larger group discussions were published in the portal. An archive of the exam procedure was attached as well, i.e. videos captured and photos taken during the exam. The materials were available only to an authorized group of students.

The authors present the results of electronic examination research at the Department of Pathophysiology of The Poznan University of Medical Sciences for Polish- and English-speaking students (Figure 2).

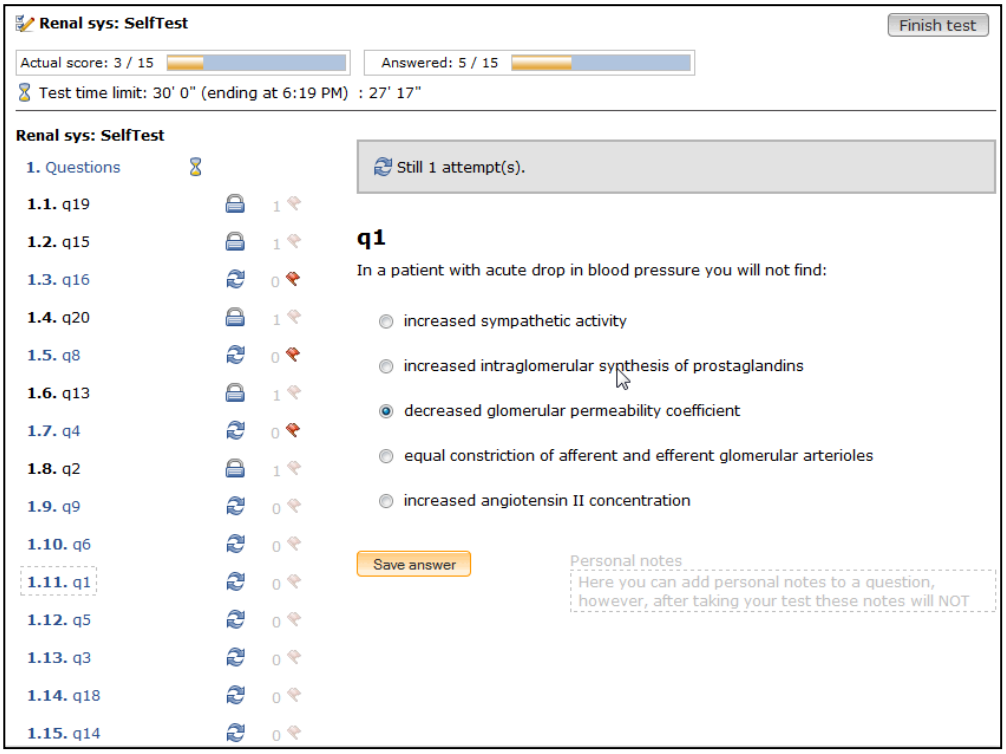

Figure 2. Example of pathophysiology test in OLAT

Source: own work

4. 1 Results and discussion

4.1.1 The following answers were given by students (Polish- and English-speaking, n=85) to the question concerning the pathophysiology exam: "I liked the test in electronic format because...":

- I know my results immediately 76%
- I see a clear list of questions 43%
- system can show the correct answer 38%

- time of the test measured individually 32%
- the same time for everyone 31%
- a random set of questions – proof of the student's independence 21%
- system drawing questions – a more objective test 20%
- I can see which questions I have already answered (padlock symbol) 18%

The students participating in electronic knowledge evaluation would point to 3 items on average from the 8 available options (multiple-choice question) - reasons they liked the electronic exam. Information about the result after the test has been submitted was the most frequently chosen option (76%), an important aspect for students in an electronic exam. The students also appreciated the test interface in the portal - a transparent list of questions with information about the number of answers already given (43%). Moreover, the students liked the fact that they received feedback after answering each question about whether their answer was right or wrong, and about their score at any time during the test (38%). With electronic examination, the exam duration can be controlled individually (32%) and is the same for every participant. Research shows that this aspect is important for students (31%). Comparative analysis of answers given to that question between the groups of Polish- and English-speaking students did not reveal any significant differences.

4.1.2 The following answers were given by students to the question: "The electronic pathophysiology exam was difficult for me because..." (Figure 3):

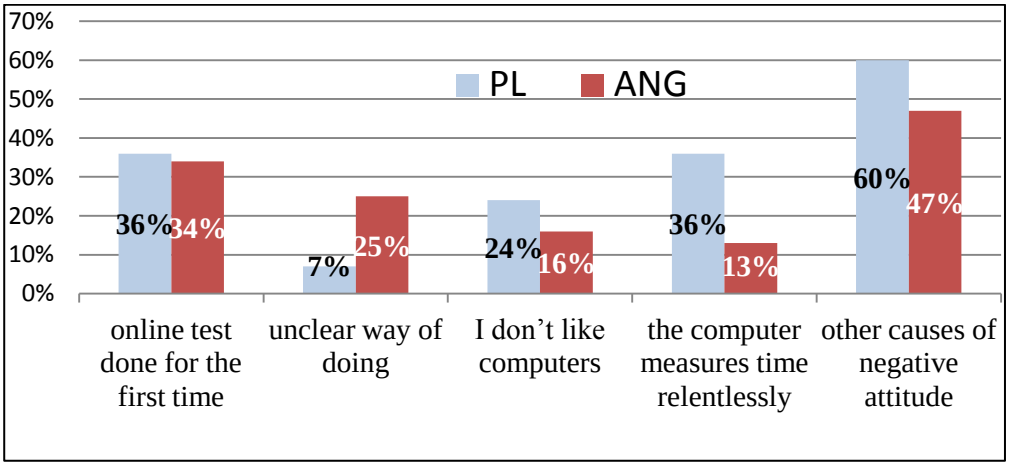

Figure 3. Answers to the question: "The electronic pathophysiology exam was difficult for me because..."

Source: own work

The students would point to 2 items on average from the 5 available options (multiple-choice question) - reasons that rendered the exam difficult. Only in the case of the answer "the computer measures time relentlessly" would the covered

groups of students (42 Polish and 32 English-language students) differ significantly ($p=0.023$, $p<0.05$); for the remaining options, no significant differences were observed between the groups. Still, it should be added that in a comparison for the category of "unclear way of doing", p value received was on the border of significance ($p=0.07$, $p>0.05$). The results obtained indicate that Polish students are more stressed by seeing exam time counted automatically (36%) than their foreign counterparts (13%). From the answers given to "online test done for the first time", we may infer that electronic examination format is not very popular in Poland or abroad, as the results were not significantly different. Pilot survey did not reveal any anticipated differences in this respect. In the case of the students who chose the final option, namely "other causes of negative attitude", their reasons could not be clearly determined. The authors suppose that within the group of Polish students, this option could have been chosen for the late time of exam and being tired after the whole day of studying.

4.1.3 The next question was the following "I found the online tests I have done before to be...". The distribution of answers is presented on the figure 4.

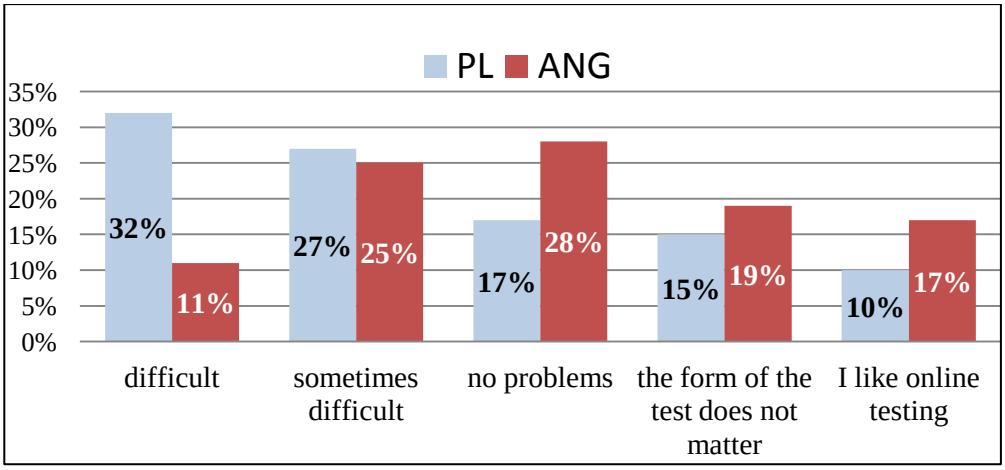

Figure 4. Answers to the question: "I found the online tests I have done before to be..."

Source: own work

Significant differences ($p=0.046$, $p<0.05$) were discovered within the answers to that question when the results from the studied groups were compared (Figure 5). The options chosen by Polish students (Median=5="difficult") differed from those selected by their foreign counterparts (Median=3="does not matter"). According to the authors, the reason behind this difference is the different level of ICT competences.

4.1.4 The students were also asked "what they considered to be negative about tests in electronic format". The following distribution of answers was obtained (Figure 6).

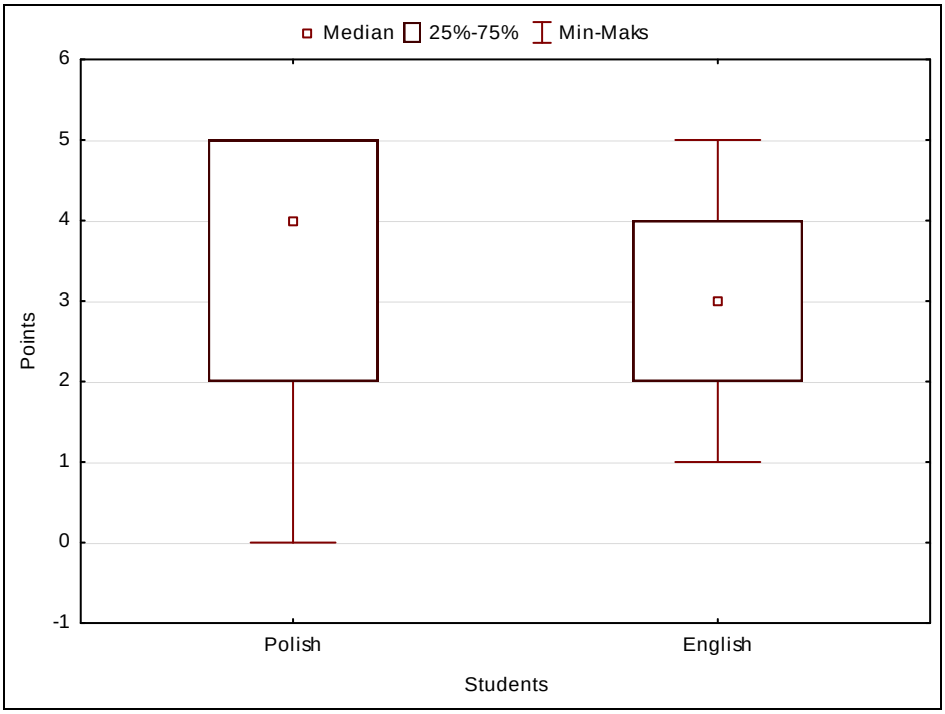

Figure 5. Comparison of answers to 4.1.3 question

Source: own work

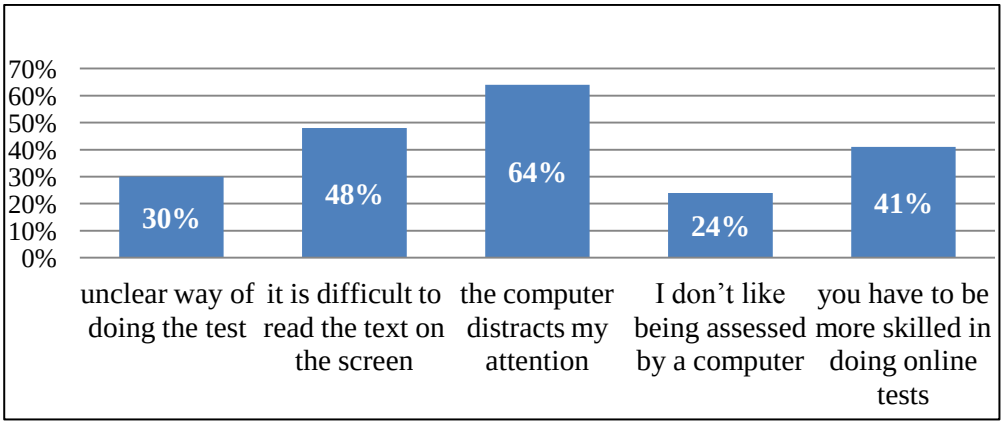

Figure 6. Answers to the question: "What they considered to be negative about tests in electronic format"

Source: own work

The answers to questions 4.1.3 and 4.1.4 may corroborate the statement that an automatic exam is not an easy task. It requires a consistent methodology and

adequate exam parametrization, according to the field of study and exam conditions. The methods of creating exam questions and accuracy of the questions database also play an important role here. After every edition of exams, the results obtained by students should be analyzed, including detailed analysis of exam questions in order to eliminate those which are found erroneous, too difficult, or too easy. Research in the field may help minimize the level of error in terms of technical, methodological and professional aspects, while properly prepared electronic knowledge evaluation would be useful for years.

4.1.5 The exam participants were asked for their opinion about: "I will be happy to answer online questions in the field of..." (Figure 7).

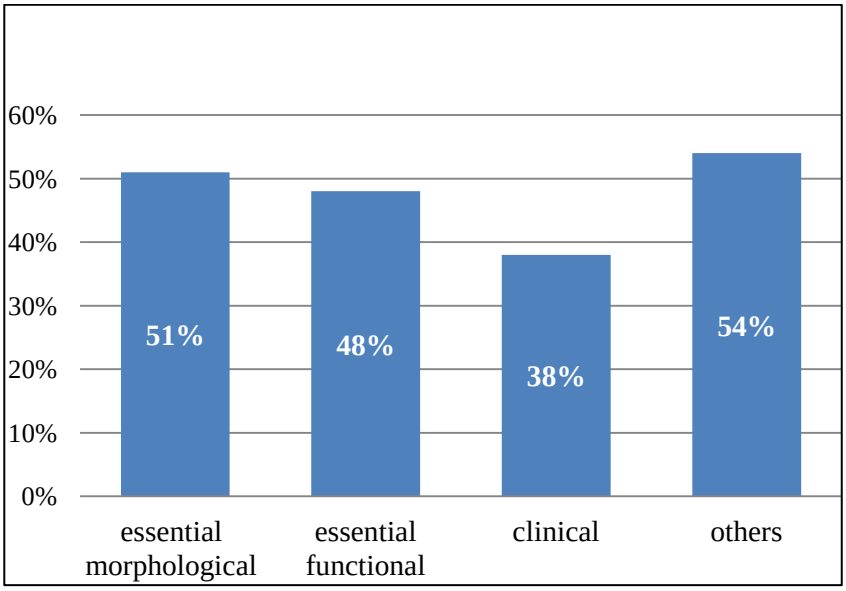

Figure 7. Answers to the question: "I will be happy to answer online questions in the field of..."

Source: own work

The distribution of answers to that question confirms the observation that electronic evaluation and distance learning are much more expected by students at courses such as essential morphological or eseential functional than clinical courses.

4.1.6 Exam grades. Because this was a pilot implementation of electronic knowledge evaluation, the students took the exam twice. After they passed the on-line exam, they took it again in traditional paper format. The results achieved by the students in both exams did not vary significantly. Therefore, it may be inferred that the exam organization form does not affect the results.

Actions taken to implement automatic examination in medical education are reasonable and needed but they require proper preparation, considering the unique characteristics of these studies (Ren-Kurc, Roszak, 2011).

The presented results of the pilot implementation are used during exams at the Department of Pathophysiology and may be helpful for other medical education institutions.

CONCLUSION

It may be inferred from the results obtained that the e-learning method is no worse in any aspect than the traditional method of teaching professional subjects in the field of nursing and physiotherapy. The e-learning method is perceived by students as more convenient and easier in terms of acquiring knowledge, due to continuous availability of interactive learning materials. Learning materials prepared on a high level of advancement in terms of content and methodology, available non-stop in an e-learning portal, facilitates good preparation to the final exam by students and helps them acquire and master their knowledge in the given field.

Research results show that average exam results for the subjects of therapeutic massage and obstetrics, gynecology and gynecological and obstetric nursing during 2009-2012 were similar, with slightly higher grades recorded in the e-learning groups. The above results indicate that both forms of education are equally effective.

Distance education requires a lot of effort during the initial stages of implementation (Roszak, Kołodziejczak, Kowalewski, Ren-Kurc, 2013). E-learning providers (academic teachers responsible for the subject matter) must cooperate with a competent team of IT experts specializing in distance learning. The authors are convinced that with the support of university bodies, involvement of teaching staff, and valuable suggestions from students, distance learning can be gradually implemented in all the fields of study at medical universities. Apart from IT facilities (computer labs, e-learning portals, and a team of IT specialists), certain changes are also needed in the regulations/statutes laying down the operating rules of universities.

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THEORETICAL AND METHODOLOGICAL ASPECTS OF MOOCS. AN ANALYSIS OF SELECTED EXAMPLES

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Abstract: *The aim of the article is to analyze the methods and models of functioning MOOCs and their importance in traditional education. To achieve the above objectives literature recorded in the selected databases was studied. The results were complemented by selected characteristics of the platforms developed according to uniform criteria. The discussion of the orientations of development MOOCs as alternative models of education was presented at the end.*

Keywords: MOOCs, e-learning, open educational resources (OER)

INTRODUCTION

The aim of the article is to analyze the methods and models of functioning MOOCs and their importance in traditional education. To achieve the above objectives literature recorded in databases was studied: ERIC, LISA, LIST, Teacher Reference Center, and collected on the basis of searches on Google Scholar. The results were complemented by the characteristics of the selected platform (developed according to uniform criteria: provider, type (commercial, non-profit), example institutional participants, educational offer, the community, other.

Search in the selected databases was performed with the use of indexes, selecting index *TX All Text* (in databases: ERIC, LIST, Teacher Reference Center) and index *Everywhere* (in database LISA) and entering the search term *MOOCs*. The total number of records retrieved (20th August) was 461. Analysis of the retrieved records registered in the database ERIC allowed to extract the following thematic categories:

- Conference and symposium on MOOCs;

- Surveys on the use of MOOCs;

- Expressiveness and emotive vocabulary in MOOCs;

- Technological aspects of MOOCs;
- Impact of MOOCs on higher education;
- Connecting MOOCs and library services;
- MOOCs vs mobile knowledge;
- Examples and types of MOOCs;
- Research ethics in emerging forms of online learning;
- The importance of MOOCs in educational practice.

The selected and specific issues were discussed in the next parts of the article: (1) institutions involved in the creation and providing MOOCs (American, European, Polish); (2) the specificity of action of MOOCs and procedures for the confirmation of qualifications; (3) the use of the platform of MOOCs (offers, structures, users).

1. THE INSTITUTIONS INVOLVED IN THE CREATING AND PROVIDING of MOOCs

The term MOOCs was first used in 2008 by Dave Cormier of the University of Prince Edward Island and Senior Research Fellow Bryan Alexander of the National Institute for Technology in Liberal Education. In the first MOOC participated 2,200 people. The course was called *Connectivism and Connective Knowledge* (also known as *CCK08*). The basic assumptions for the course were: open access and resources built on the concept of distributed content. All course content was available through RSS feeds, and students could participate through online collaboration tools, including blog posts, threaded discussions in *Moodle* and *Second Life meetings* (S t e p h e n 2008).

In 2011, Stanford University launched three courses whose subject was the introduction to AI. The number of people recorded on the course was 160,000. Sebastian Thrun and Peter Norvig, and later Andrew Ng and Jennifer Widom were the first creators of the courses. Thrun founded Udacity and Daphne Koller and Andrew Ng launched the company *Coursera*. Then the Cousera announced a partnership with University of Pennsylvania, Princeton University, Stanford University and University of Michigan. In 2012, on the initiative of MIT the not-for-profit *mITX* was founded, renamed later to *EdX*. Harvard University, University of California, University of California Berkeley, University of Texas System, Wellesley College and Georgetown University joined the group of universities, which used *EdX*. In January of 2013 *Udacity* launched its first MOOCs in collaboration with San Jose State University. It was partnered with AT&T and Georgia Institute of Technology. As for May 2014, more than 900 MOOCs are offered by US universities (L i s t o f M O O Cs 2014).

In Europe, work on the development and implementation of MOOCs began in 2012 (M a s s i v e o p e n 2014). In the same year, work began at the University of Helsinki. The ex-Nokia employees in Finland based CBTec launched *Eliademy.com* based on the Open Source Moodle *Virtual learning environment* (VLE). The UK's Open University launched a British MOOC provider, *Futurelearn*, as a separate unit, and then it teamed up with partners outside the university. MOOCs courses are also made available by other universities and institutions: Universidad Politécnica de Madrid with the use of the platform *Crypt4you*, Stifterverband für die Deutsche Wissenschaft with the use of the platform *iversity.org*, the Ireland ALISON (Advance Learning Interactive Systems Online), the France Universite Numerique and other. The transnational platform *OpenupEd* operates with the support of the European Union (M O O Cs i n E u r o p e 2013).

MOOCs, currently offered in Poland, are used in the implementation of some subjects at university in the English language, for example within the Centre for International Education at the University of Łódź. There still does not exist the consortium implementing the Polish version of MOOC. It is postulated that in the future the consortium will have the appropriate structure and offer relevant topics including ITC, accounting for field research and implementation and teaching activities, in accordance with the best conceived idea of *problem-based learning* (PBL) (K r a ś n i e w s k i 2013a).

In spite of the absence of the consortium implementing the Polish version of MOOCs, a lot of courses and distance education platforms are implemented. For example. Wroclaw University of Technology offers classes on education platform *ePortal* (e P o r t a l z d a l n e j e d u k a c j i 2014), where students can choose courses of interest to them with constantly widened base classes. Appropriate studies have been carried out and the methods of implementation of distance education courses have been compared on the basis of Wroclaw University of Technology portal and portal *Coursera*. *ePortal* platform adopted formulas with examples of western platforms, referring directly to the objective of e-learning in universities. Its level can be described as high, also for reasons of improving teaching and saving lecturers' and students' time (Ż e l a z n o w s k a 2014).

The course prepared as a project of the Warsaw School of Data Analysis (WSAD) is another aspect of the MOOCs. The project includes the launch of a platform (specifically the extension of the platform COME) and two electronic courses of data analysis (S m a r t e r P o l a n d 2014). On the other hand, on the Virtual University are available online courses (12 courses in economics, finance, information technology, law, sociology). Information about the courses includes the objective, theme, structure, method of implementation and the certificate confirming the implementation of the course. Access to the course requires log-in (U n i w e r s y t e t W i r t u a l n y 2014).

In light of the report *Open science in Poland 2014. Diagnosis* the most important element of open science in Poland is open access to scientific content, and other

forms play a minor role or even are absent. Open access is implemented by the editors of scientific journals (almost half of Polish scientific journals is open), centers providing IT solutions and a few institutions providing repositories (S z p r o t 2014). In this context, particularly important are MOOCs that arose as *open educational resources* (OER). On the other hand, it is impossible not to notice that most of the courses available in this way do not share their resources as open. It also raises the question how long such courses will be available as free (M i t c h e l l 2014).

2. THE SPECIFITY OF THE ACTIONS OF MOOCs AND PROCEDURES FOR THE CONFIRMATION OF QUALIFICATIONS

Open education is related to the performance of the digital revolution. *Thanks to digital technology we all will be able to learn anywhere, anytime, using any available devices freely using the help of others* (S p r a w o z d a n i e 2013, p. 4). The main objectives of this initiative are: - *the creation of institutions, teachers and students to teach and learn in a more innovative way, by increasing the scope of application of digital technologies and content [...]; - wider use of Open Educational Resources (OER) by ensuring that educational materials whose development was financed from public funds, for example with the new EU education program Erasmus+, it will be available without any restrictions [...]; - greater, from the point of view of users, clarity on the issue of copyright to educational resources (*S p r a w o z d a n i e 2013: 4-5*);* - assistance in obtaining broadband Internet access and construction of ancillary infrastructure information and communication technologies (ICT) for use in the process of teaching and learning; - strengthening cooperation with international organizations and other institutions, to better understand the importance of technology in teaching and learning and to enable learning and testing new solutions in this area (S p r a w o z d a n i e 2013). Undoubtedly, the scope of these tasks is part of the design, implementation and dissemination of MOOCs.

MOOCs in the field of education are variously defined and classified, for example as the concepts of learning objects (L i t t l e j o h n 2003) or open educational resources (G l e n n i e, H a r l e y, B u t c h e r, v a n W y k 2012). These courses are classified as MOOCs, xMOOCs or cMOOcs. According to George Siemens cMOOCs refer to the connectivism model and xMOOCs are courses more institutionalized and structurally organized. Some authors believe that the so-called cMOOCs are more creative and dynamic than the current xMOOCs that resemble TV programs or digital textbooks (C o n o l e 2013).

Describing the nature of MOOCs Stephen Downes proposed four criteria: autonomy, diversity, openness, and interactivity (D o w n e s 2010) In contrast, Donald Clark (C l a r k 2013) proposed a taxonomy of the following types of MOOCs:

- transferMOOCs – where existing courses are transferred to Mooc (*Coursera* courses largely fall into this category);

- madeMOOCs – courses that are more innovative and interactive, effective use of video (*Udacity* take this approach);

- synchMOOCs – courses with fixed start and end date (*Coursera* offers such courses);

- asynchMOOCs – courses that do not have a fixed start and end dates and deadlines are more flexible (*Udacity* have developed their courses to enrol and proceed at user's own pace and *Coursera* offers a completely open self-study option);

- adaptiveMOOCs – courses that provide individualized educational process with the use of dynamic assessment and data collection on the course (*Cogbooks* is a leading example of this type of MOOC);

- groupMOOCs – courses that focus on cooperation in small groups (*NovoEd* which offers both MOOCs and closed, limited number, internal courses);

- connectivistMOOCS – courses that emphasize collaboration with peers in the Network (connectivist MOOCs rely on the connections across a network rather than pre-defined content);

- miniMOOCSs - which are much smaller than the traditional massive MOOC (to be more intense experiences that last for hours and days, not weeks) (C o n o l e 2013).

An important issue in the operation of MOOCs is confirmation of acquired skills obtained during their implementation. Increasingly, we have to choose the path of unofficial and official path - which is completed by diploma roll call. An example of such an official path (*Signature Track*) is the path implemented on the platform *Coursera*. The *Signature Track* is payable (although, at least so far, you could enroll in the free, and after a few classes to decide that you want to get a/the paid certificate). Diploma is a qualification sponsored not only by MOOC, but also by the participating university. Electronic version of diploma we can link (secure URL) and we can connect to our account in Linked In. A similar solution was introduced on the platform *Udacity* (path *Verified Certificates*). Both the first and second case procedure is required to confirm the identity (presentation of an identity document, webcam use during classes) (W r o n a 2014).

3. THE USE OF THE PLATFORMS FOR MOOCS

By the end of the 2013, 18 of the top 20 universities in North America were offering MOOCs (F u t u r e L e a r n 2014). In November 2013, in 28 institutions from the European Higher Education Area (24 from EU member states, plus three from Russia and one from Turkey) were offering courses on *Coursera* (G a e b e l 2014). These and other data confirm that the number of offered MOOCs increases. The list of the most important providers of of the MOOCs model are shown in Table 1.

Table 1.

Characteristics of selected platforms of MOOCs[1]

Provider (accessed)	Description	Type	Example institutional participants	Educational offer	Community	Comments
Audacity (http://audacity.sourceforge.net/)	It is free software, developed by a group of volunteers and distributed under the GNU General Public License (GPL).	Non-profit	Some vendors, Umixit, Thinklabs, and Audiotouch, have additionally supported Audacity by sponsoring custom versions	We can use Audacity to: -record live audio, -record computer playback on any Windows Vista or later machine, -convert tapes and records into digital recordings or CDs, -edit WAV, AIFF, FLAC, MP2, MP3 or Ogg Vorbis sound files, -other.	Community members offer: subscribe to the audacity-users mailing list to share tips, visit the Audacity Wiki, join our Audacity Forum.	Audacity is a multi-track audio editor and recorder for Windows, Mac OS X, GNU/Linux and other operating systems. The interface is translated into many language.
Canvas.net (www.canvas.net/)	It gives instructors and institutions an open platform to share their expertise and institutional experience with the world.	Commercial	The Canvas Network has a built-in network of 260+ schools to create open online courses based on their current customer base. Likewise, they have ~4.5 million students already using the platform.	Canvas Network offers open, online courses taught by educators everywhere. It is developed and supported by Instructure, an education technology company that partners with educators, institutions, and	Courses are defined by you--whether long or short, involved or hands-off, fun or serious. Canvas Network is where instructors can design and teach the type of open	Canvas Network leverages the features of Canvas to provide a simple, flexible experiegnce.

[1] Based on the analysis of web pages: M o o c L i s t and L i s t o f M O O C s.

				technologists.	courses that fits them and the vision of their institutions.	
Cogbooks (http://www.cogbooks.com/)	It is an adaptive web-based learning platform. Their vision is make web-based learning as effective as it can be for each individual learner.	Commercial	The platform is used by publishers and institutions in the US and UK post-secondary education market, including Edinburgh University, the OCR exam board and many others. Off-the-shelf training programs can be purchased individually or in packaged suites for 10 or 10,000 users.	CogBooks can be incorporated into standard Learning Management Systems or Virtual Learning Environments allowing you to easily upgrade to a Personalized Learning Management System (Personalized LMS) without changing your existing software.	The network presents information on the blog (subscribe by e-mail, blogs we like, website we like, articles and resources, categories, archives, blogs by associates, staff favorites).	The CogBooks adaptive learning platform lets you personalize your web-based learning so that each individual receives the learning and support they need, at every step.
Coursera (www.coursera.org)	It is an education platform that partners with top universities and organizations worldwide, to offer courses online for anyone to take, for free.	Commercial	As of September 2014, Coursera has 9.2 million users in 750 courses from 111 institutions. (for example: University of Maryland, Wharton School, University of Virginia, Stanford University, University of Tokyo).	Courses are eligible for specialization certificates, verified certificates, on-demand and starting soon.	Coursera empowers people to improve their lives, the lives of their families, and the communities they live in with education.	The aim to empower people with education that will improve their lives, the lives of their families, and the communities they live in.
Crypt4you (crypt4you.com)	Crypt4you new format is a massive, online and free education in information security.	Non-profit	It is the first MOOC, in Spanish in information security, was created March 15, 2012 within the Thematic Network of Cryptography and Information Security Criptored at the Polytechnic University of	The courses are on cryptography and information security.	To learn more about this training project, reading the FAQs is recommended.	Crypt4you developing other projects of mass training; among them are the Visual Encyclopedia of Information Security and Información Intypedia y las Píldoras Formativas

			Madrid. His courses exceed 400,000 visits.			Thoth.
EdX (www.edx.org)	EdX was created for students and institutions that seek to transform themselves through cutting-edge technologies, innovative pedagogy, and rigorous courses. EdX is based in Cambridge, Massachusetts and is governed by MIT and Harvard.	Non-profit	EdX offers interactive online courses and MOOCs from the world's best universities, and institutions (for example: MIT, Harvard University, UC Berkeley, Kyoto University, Australian National University, University of Queensland, IIT Bombay).	Topics include biology, business, chemistry, computer science, economics, finance, electronics, engineering, food and nutrition, history, humanities, law, literature, math, medicine, music, philosophy, physics, science, statistics and more.	edX Blog presents Guest Post and full articles.	The aim of the platform is to become a leading resource for learners and learning worldwide by staying focused on the goals and principles set forth when forming edX.
Eliademy.com (https://eliademy.com)	It supports educators and students with free online classrooms that enable them to create, share and manage courses.	Commercial	Started in February 2012, Eliademy is backed by CBTec Ltd, a company founded by ex-Nokia veterans, who possess core expertise in Open Source Technology. It is used, inter alia, by Aalto University Executive Education.	Every organization has its own private learning space and course catalog. You can create introductory courses or safety course for employee.	Eliademy offers an educational calendar. the platform offers a news feed and e-mail notification system that everybody can personalize according to their own learning schedule.	The Eliademy mobile application is an extension of Eliademy. Eliademy is also compatible with Moodle LMS.
Future Learn (www.futurelearn.com)	It is aim is to connect learners from all over the globe with high quality educators, and with each other. The platform is	Non-profit	FutureLearn offer a diverse selection of free, high quality online courses from some of the cultural institutions and world's leading universities (for example: University of	Courses are available in three categories: New & upcoming, In progress, Past.	FutureLearn have had a lot of experience in developing successful online and mobile consumer products, for some of the biggest brands in	The FutureLearn team – currently based in the British Library, near King's Cross, London – contains experts in learning design and

	a private company wholly owned by The Open University (UK).		Reading, Open University, Monash University, Trinity College Dublin, Warwick University, University of Bath, University of Southampton).		broadcasting, publishing, marketing, gaming and social networking.	educational technology. It works with companies such as BBC, Microsoft, Skype, Harper Collins, Bigpoint, Endemol, BSkyB, NBC, Paul Smith, Jasper Conran, and GOV.UK
iversity (https://iversity.org/)	It is a platform for Massive Open Online Courses. They are a diverse interdisciplinary team based in Berlin, Germany.	Non-profit	iversity is being used by hundreds of professors to organize classes at dozens of universities (for example: Universidad Autonoma de Madrid, University of Florence, University of Hamburg).	Courses offerings are constantly expanding and cover a range of subjects that include medicine, computer science, economics, physics, law, design and philosophy.	iversity work in close cooperation with instructors, universities and knowledge-based companies to build high-quality courses that are engaging, interactive and fun.	The partnered institutions have the opportunity to offer exams that award ECTS credits.
Khan Academy to Platforma (www.khanacademy.org)	It is a not-for-profit organization with the goal of changing education for the better by providing a free world-class education for anyone anywhere.	Non-profit	Khan Academy has received the time, energy, and expertise of many volunteers and part-time contributors.	The library of content covers math, science topics such as biology, chemistry, and physics, and even reaches into the humanities with playlists on finance and history.	Students can make use of our extensive library of content. Coaches, parents, and teachers have unprecedented visibility into what their students are learning and doing on Khan Academy.	The platform is joining millions of Khan Academy students from all over the world who learn at their own pace every single day.
MiríadaX (www.miriadax.net/web/excel-avanzado)	It is an initiative created by Telefónica, via Telefónica	Lack of information	MiriadaX is used by the Universia (the most important university network in	During the pilot scheme around 700,000 persons had signed on in one or more of the 153	Courses are open to all audiences, regardless of whether the participant is	MiríadaX is the second Mooc platform in the world and the first in

	Learning Services (TLS) and Banco Santander via Universia, the biggest network of Spanish and Portuguese speaking universities (institutions officially launched the definite portal on 27 July 2014 in Rio de Janeiro).		Ibero-America, comprising 1,290 universities from 23 countries, representing 16.8 million students and professors).	MOOCs offered2.	a university student or not, or belongs to a specific university.	Spanish3.
NovoEd (https://novoed.com/)	It is allowed to take courses from thought leaders and distinguished professors from top universities; to get to know your fellow students around the world as you collaborate with them on course projects; to work on real-world course projects that excite you and make a difference.	Commercial	The partners include universities, foundations, training companies, consulting firms, and corporations. (for example: Stanford University, Carnegie Foundation, Universidad Católica de Chile).	NovoEd partners with leading institutions to offer team-based courses and programs that emphasize project-based learning.	Users can share your feedback about course material, structure and your experience on your course forum.	The learning environment can be used in online courses (either free or for a fee).
OpenupEd (http://www.openupe	It is a portal of a pan-	Non-profit	OpenupEd has been initiated by the European	Courses are available in two categories:	It is to 'open up education for you' who	In order to account for the variety in

[2] Global Statement 2014.
[3] Santander Corporate.

d.eu/)	European initiative OpenupEd around so-called MOOCs. The OpenupEd initiative was launched on April 25th 2013.		Association of Distance Teaching Universities (EADTU) and mostly involves open universities. The 11 launch partners are based in France, Italy, Lithuania, the Netherlands, Portugal, Slovakia, Spain, and the UK, and outside the EU in Russia, Turkey and Israel. Another 10 institutions confirmed that they most likely will join this initiative in the near future.	Institution, Language(s).	wishes to learn at the level of higher education in the language you prefer without a whole set of restrictions, restraints and regulations.	needs and circumstances of (lifelong) learners and the demands of a changing knowledge-based society, openness may serve in various ways (high-quality learning materials designed for self-study; in the best tradition of the highly acclaimed open universities model).
iTunes U (http://www.apple.com/education/ipad/itunes-u/)	iTunes U is a dedicated section of Apple's iTunes Music Store that features educational audio and video files from universities, museums and public media organizations for free download to PCs and mobile devices4.	Non-profit	Participating institutions include Stanford, UC Berkeley, University of Melbourne, Texas A&M, MIT, Yale, Trinity College Dublin and other.	In the 2008 since its introduction, iTunes U has logged over 4 million downloads.	The user is required to download and install iTunes on an Internet-connected PC and then visit the iTunes Store. The user may also visit the relevant subdomain of a participating university, like http://itunes.stanford.edu	The iTunes U app lets students enroll in a course and download all of the materials they need when they are connected to Wi-Fi — which means learning and studying can happen anywhere, at anytime with just an iPad.
Udacity (www.udacity.com)	It mission is to bring accessible, affordable, engaging, and highly effective higher education	Commercial	Udacity was created at the Stanford University experiment in which Sebastian Thrun and Peter Norvig offered their	Courses that allow you to master basics and build a solid technical foundation (business, marketing, finance, design,	Relevant courses taught by passionate, experienced industry leaders from companies such as	The courses are on-demand so you can level-up your skills just in time to start that new project, take on new

[4] W h a t I s. c o m.

	to the world.		"Introduction to Artificial Intelligence" course online to anyone, for free. (over 160,000 students in more than 190 countries enrolled).	and product management require technical skills). Courses are for all skill levels.	Google, Facebook, Cloudera, and MongoDB.	responsibilities, and explore new technologies.
Udemy (http://www.udemy.com/)	It mission is to help anyone learn anything online.	Commercial	Cooperating institutions are, among others, Georgia Institute of Technology, San Jose State University, Google, Salesforce, Facebook, Cloudera, Nvidia, Autodesk, Cadence.	Characteristics of the platform: 18,000 courses, 10,000,000 course enrollments, 53 course languages, 2,400,000 minutes of video content.	Every course is available on-demand, students can learn at their own pace, on their own time, and on any device.	4 million+ students are taking courses in everything. Each of our 18,000+ courses is taught by an expert instructor.

New offer of open courses in distance education includes courses which are characterized in that they are completely free (fee is charged sometimes only for the certificate), public (in a course may participate everybody who has access to the Internet), offered by reputable universities (first courses on *Artificial-Intelligence* have been released by Stanford University in California, another *Circuits and Electronics* - course realized in the field of electronic engineering - by the Massachusetts Institute of Technology), implemented was based on modern educational tools available over the Internet. This is a new educational model (first courses were made available to this system in 2012), and now more and more universities reach this form of education (K u r u l i s z w i l i c a 2013: 58).

E-learning courses are often used to improve the qualifications of employees of banking, medical doctors, computer scientists, teachers, salesmen, industrial workers, lawyers, employees of insurance and financial sector. There is also a group of issues that are particularly well suited to e-learning, regardless of which group will be dedicated to professional training. These include: e-learning courses in computer application service (popular computer programs, office programs, communication, financial and accounting or professional - dedicated to specific institutions platform), training, marketing and sales (the so-called product training, prepared specifically for a particular company and a particular product), legislative training (training on the amendments to the law on public procurement, training, protection of personal data or information security), universal training (eg. mandatory safety training, service in secretariat of the institution in business training, job design mode or time management), language training, e-learning area,

which apparently may seem difficult to teach this method (eg. training in the first aid, soft skills training, such as negotiation, conflict resolution, team management and change management), specialist management training (eg. of the foundations of the theory of constraints and implementation of Lean Manufacturing) (K u r u l i s z w i l i c a 2013: 60-61). MOOC courses are also designed for librarians, for example course *Library Advocacy Unshushed. Values, Evidence, Action*, organized by the Faculty of Information (iSchool) at the University of Toronto using the platform *EDX* (e d X: L i b r a r y 2014).

The offer of courses is increasingly addressed also to individuals (these are usually subjects also performed as part of vocational training, such as coping with stress, but also learning to cook, or rather odd - such as the art of seduction of women for men). A large range of courses and growing demand clearly indicate the popularity of this form of teaching. The diversity of subject matter training available shows that e-learning can help to improve skills in many areas, occupations addressed to different audiences (K u r u l i s z w i l i c a 2013: 61).

It is also worth mentioning that the biggest platforms Mooc often formed as spin-offs (a company formed at the initiative of the university and closely collaborating with them in order to transfer knowledge from the academic world) of the company of the most well-known universities and technical colleges. For example *edX* is the effect of cooperation between Harvard University and MIT (Massachusetts Institute of Technology), while *Coursera* is a spin-off from the University of Stanford (L e w i n 2012). Potential of MOOCs platforms is recognized in the private sector. For example, Bill & Melinda Gates Foundation granted in November 2012 12 grants to support the development MOOCs. The total amount of funding amounted to $ 3.000.000 (W a i s 2013).

CONCLUSION

Lines of action and development of MOOCs are the subject of many workshops, programs, experiments, for example a workshop entitled *Developing Issues in Licensing: Text Mining, MOOCs, and More* which was co-sponsored by the Collection Development and Electronic Resources Management Interest Groups of the Association of College and Research Libraries New England Chapter (Indianapolis, April 10-13 2013) (R a t h e m a c h e r, S m i t h 2013). It is proposed that MOOCs were used in blended learning and converted themselves in MOCCs (Mid-Sized Online Closed Courses). Such projects involve a limited number of students who pay tuition. An example of such a course is *Master in Computer Science*, which was established in January 2014 within the framework of the agreement *Udacity* and the Georgia Institute of Technology. 600 students participated in the course (ultimately 10.000 of the world), the tuition fee is $ 6.600 ($ 45.000 for full-time studies), the course was supported by AT&T in the amount of $ 2 million (M O O C P o t e n t i a l 2014). Among the other forms are SPOCS (Small Private On-Line Courses) used locally with on-campus students and mOOCs

(micro Open On-Line Courses) - a small, highly targeted course (K r a ś n i e w s k i 2013).

It seems that in the area of technology offered the most visible change is the transfer of attention from the organization of teaching in closed e-learning environments on the introduction of arrangements for teaching in a more flexible and open way (Z a j ą c 2014). The basic, new methods of knowledge distribution through the new media of universities that provide online scientific content, are inter alia: science blogs, recorded lectures and podcasts, distributed through university dedicated channels, channels such as *YouTube* and *iTunesU* and our own servers streaming or e-learning platforms, such as synchronous learning environment *Wiziq* on the *Moodle* platform, and open lectures online, including massive open courses (MOOCs) (G o b a n – K l a s 2014).

Inspiring pedagogical theories aided tools in the network and applications on mobile devices allow you to create Individual Learning Environment (PLE). Information, knowledge and work rules are personalized and tailored to the recipient. It is creating presentations and visualizations, infographics, videos, teaching, computer simulations, work in the cloud computing. All these new solutions can be used in the created and developed MOOCs, a popular idea MOOCs draws a picture of the future of global education (R u d n i c k a 2013).

Techniques to better prepare graduates for professional start, observations of economically active persons about their educational experiences and effectiveness of education, as well as efforts on improving the methods, techniques, forms and training programs should have an effect on the appropriate preparation of young people for employment and further development. Alternative models of education, which also certify the completion of the programs and their paths within the bulk of online courses (MOOCs) offered by leading universities in the world, as well as certificates sponsored by individual employers or their associations serve this purpose, inter alia. Current questions remain: whether MOOCs are the real threat to the future of higher education and level of education? What is their place in traditional universities? How to encourage teachers to their preparation?

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- http://openeducationeuropa.eu/en/find/moocs
- www.class-central.com/
- www.coursetalk.com/
- www.distancelearningportal.com/articles/241/moocs-online-education-for-the-masses.html
- www.moocs.co/Higher_Education_MOOCs.html
- www.mooc-list.com/
- www.uniwersytet-wirtualny.edu.pl

"TACTILE GENERATION" AND "DIGITAL IMMIGRANTS": USING MEDIA IN THE FORMAL AND INFORMAL EDUCATION

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Abstract: *The article focuses on the way in which current Czech pupils and students as the representatives of the so-called "tactile generation" use various types of media in formal and informal education and what their teachers think about using media in education. The research was designed as practical research. Pupils from one elementary school in Prague (10 – 15 years) and students from two high schools (15 – 20 years) participated in this research. This research serves as the basis for discussion of the role of (new) media in the process of education of Czech youth.*

Keywords: tactile generation, media, education, Czech Republic, digital immigrants

1. INTRODUCTION

This article focuses on the way in which students and in comparison teachers use various types of media (so-called "new" and traditional media) in formal and partly also informal education.

Media, understood as the means of learning, are changing and together with them, their appearance and intensity of using them are changing as well. In today's society representatives of the "new" media and the media based on digital technology play a more important role. According to Marshall McLuhan (1964) media is the extension of our body. An example illustrating the influence on the way we think could be using a text processor – the structure of the text written with its help is different than the text written by hand. The text is not linear anymore, it is richer and has more variety and provides more digressions. (Eriksen 2005).

From the perspective of using the media as the means of education, which is part of the process of socialization, D. Tapscott (2009) distinguishes various generations after the World War II. It starts from the **The Baby Boom generation** (born between 1946—64) which was the first generation whose members can remember that television was the accessed entertainment of their household. And continues to the **Net Generation, Gen Y, or Millennials** (1977–97) who are not only consumers

but they are the generation of prosumers (Tofler 1980). And *"For the first time in history, children are more comfortable, knowledgeable, and literate than their parents with an innovation central to society. And it is through the use of the digital media that the Net Generation will develop and superimpose its culture on the rest of society. Boomers, stand back. Already these kids are learning, playing, communicating, working, and creating communities very differently than their parents. They are a force for social transformation."*(Tapscott 2009: 11)

What is important from the perspective of education is the fact that members of this generation also need a different pedagogical approach. *"They are forcing a change in the model of pedagogy, from a teacher-focused approach based on instruction toward student-focused model based on collaboration.*" (Tapscott 2009:11)

Due to precipitous development of ICT, we can identify and newly define the current generation (born from 1998 up to now) as **Tactile generation.** In many features, it is similar to the Net Generation, "but [it] is more embedded in technologies. They use touch displays and enjoy closer interface. They are used to controlling machine tools without a keyboard. Gestures in combination with voice will be their main means of communication" (Beseda and Machát 2012: 77-78). It is exactly this generation which is the subject of the text.

In contrast to the tactile generation – literally as well as metaphorically – there are their teachers and according to Prensky (2001) "digital immigrants". However, do digital natives as such exist? As Boellstorff mentions (2008) there are no digital natives in the virtual space, all of us are newcomers even though different experiences from the period of our socializations will play different roles in our relations to the Internet. The question is what differences will there be between the so-called Prensky's migrants and the young generation which he considers to be native.

At the moment, the impact of this media change on education is not known but the comments referring to using these technologies range from very positive ones to purely negative ones. Lora Evanouski (2009) claims that "by adapting technology for education, teachers, students and parents alike will see positive improvements in many different categories such as: academic performance, motivation, critical thinking skills, literacy, attitudes and real life work skill". On the contrary, German psychologist Manfréd Spitzer in his book called Digital dementia claims that digitalization of the world damages our brain (especially children's brains which are still developing), as we do not have to do many things anymore and thus our brains become simpler and dumber and negatively influence the process of education.

In this article, we will present the result of the non-representative research focusing on the way in which current Czech pupils and students, (i.e. the representatives of tactile generation), use the media in their formal and informal education. In addition, we will also present results from the research of teachers.

2. METHODOLOGY

The research was designed as a practical research and the choice of the sample does not correspond with the requirements of the representativeness. Pupils from one elementary school in Prague (10 – 15 years) and students from two high schools (15 – 20 years) participated in this research. It had the form of a questionnaire which was distributed in the classrooms by teachers in March 2014. 265 respondents took place in this research.

Table 1.

Characteristics of the sample of students

	Elementary school		High school		In total	
Girls	67	62 %	71	44 %	138	52 %
Boys	84	38 %	43	56 %	127	48 %
Total	151	100 %	114	100 %	265	100 %

Source: Own work

When dealing with research with teachers, we were interested in their attitudes to using the media in formal and informal education. We distributed a questionnaire with open questions among elementary and high school teachers. We received 60 filled questionnaires from teachers throughout the Czech republic.

Practical research focused on the media as the source of formal and informal education. We perceive the media as (physical) mediator of such education. It is understandable that in such type of research, it is necessary to prepare a selection of potential media-mediators. We included personal computers, notebooks, and tablets and partly smartphones. Traditional media was represented by television, radio, and books (including text books).

3. CONTEXT OF THE CZECH REPUBLIC

This question is valid also in the context of the current situation in the Czech Republic. There is a discussion about the way in which education especially at elementary and high schools should take place. In this sense, there are public political intensions which are concerned with the whole system of education as such (e.g. Minister of Education Marcel Chládek and his initiative supporting the purchase of tablets for teachers which they could use in their lessons (Daňková 2014), on the other hand, there are pilot projects testing new media as the means in the classrooms (e.g. "Touch the school" in Prague 6 (Skotek 2014; Microsoft).

Official statistic data proves the fact that the generation of current pupils and students is the generation growing up with new technologies (media) as a natural

part of their lives. The overall internet coverage of the households in the Czech Republic was 67 % in 2013 (CSO 2013). The number was much higher in the households with children even in 2010: 70.8 % of such households had a connection to the internet and 84.8 % of such households had a personal computer.

The official statistical data refers to using media by children older than 15 years of age. Almost 100 % of students older than 16 years of age have their own mobile phone and similar numbers are valid for personal computers and internet.

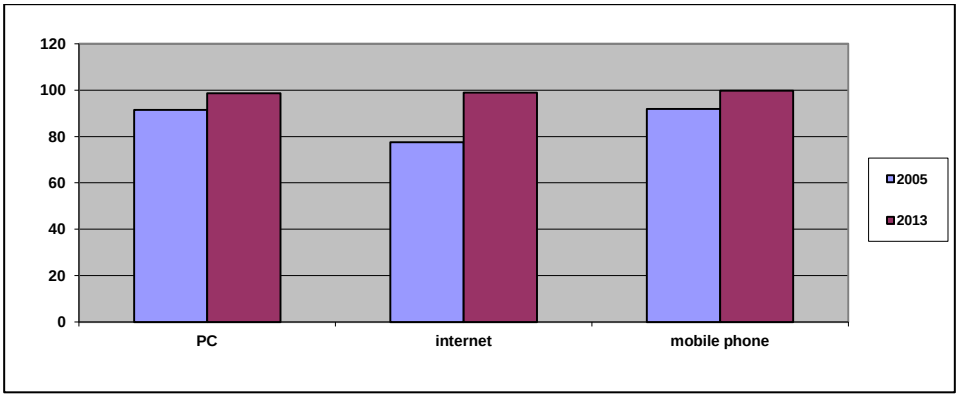

Figure 1: Students using selected information technologie % overall number of students aged 16 or older

Source: Czech statistical office 2013

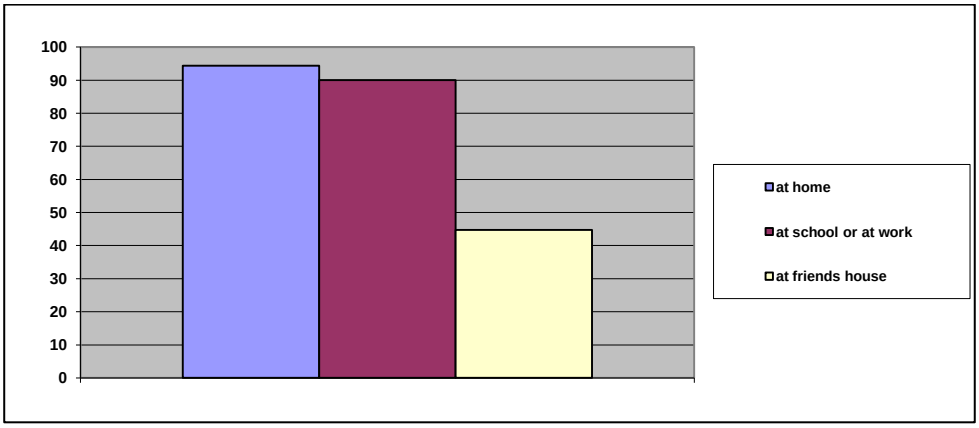

Figure 2: Students using internet according to the place of usage, 2nd quarter of 2013 % students aged 16 and older using the internet

Source: Czech statistical office

4. ANALYSIS OF RESULTS

4.1 Tactile generation: Pupils and Students

Table 2.

How often do you do the following activities? (organized by intensity of their use)

	Using PC/ notebook	Watching TV	Reading books	Using a tablet	Listening to radio	Reading newspapers and journals
every day	67.5	41.1	27.9	24.2	15.8	10.2
several times a week	23.0	39.6	30.6	20.4	20.8	30.2
several times a month	5.7	10.6	23.4	9.8	15.8	34.0
several times a year	1.1	4.2	13.6	5.7	15.5	13.6
not at all	2.3	3.8	2.6	38.5	30.9	9.8
NA	0.4	0.8	1.9	1.5	1.1	2.3

Source: Own work

Respondents of the practical research used personal computers or notebooks most often: 90 % of them at least several times a week (this represent the sum of possibilities *every day* and *several times a week*). Television (traditional media) has a strong position – 80 % of respondents watch it with similar intensity. Books play an important role as well – 30 % of respondents read books every day. And only 2.6 % of pupils do not read at all. In contrast, no user experience with a tablet (representative of the new media) has 38 % of respondents. From this perspective, books are much more accessible than tablets.

Radio and classical newspapers and magazines are the least frequently used media. Even though it does not mean that the respondents do not watch the news or listen to music – not only the physical medium has changed, it was also the format of listening or reading.

Table 3.

Intensity of using various types of media – comparison of elementary school (ES and high schools (HS), in %

	PC/ notebook		TV		Reading books		Reading newspapers and journals		Tablet		Listening to radio	
	HS	ES	HS	ES	HS	ES	HS	ES	HS	ES	HS	ES
Every day	85.1	54.3	36.8	44.4	18.4	35.1	12.3	8.6	23.7	24.5	10.5	19.9
Several times a week	13.2	30.5	39.5	39.7	31.6	29.8	29.8	30.5	11.4	27.2	21.9	19.9
Several times a month	0.9	9.3	16.7	6.0	24.6	22.5	39.5	29.8	12.3	7.9	21.1	11.9
Several times a year	0.0	2.0	2.6	5.3	18.4	9.9	14.0	13.2	7.0	4.6	20.2	11.9
Never	0.9	3.3	4.4	3.3	4.4	1.3	3.5	14.6	44.7	33.8	25.4	35.1
NA	0.0	0.7	0.0	1.3	2.6	1.3	0.9	3.3	0.9	2.0	0.9	1.3

Source: Own work

There are several visible differences between elementary school pupils and high school students. These concern the traditional as well as the "new" media. Probably the most interesting difference is the one visible in using PC/notebooks. 85% of high school students use it every day while "only" a half of elementary school pupils do. On the other hand, elementary school pupils read more: the number are 35 % of elementary school pupils and 18 % high school students read every day. This confirms the results of reading research which show that intensity of reading decreases with the age (National Library 2013, SCIO 2013) (What activities do students and pupils do using "new" media which are *on-line*, i.e. on their PC, notebook, or tablet? Primarily, do they communicate (social networks, e-mails etc.), they have fun (movies, music, videos, games), they search information for their formal education (i.e. preparation for school), or they educate themselves informally by searching information about the areas which are not directly connected to their formal education? We are aware of the fact that this division of activities does not embrace their multidimensionality since education can take place during communicating or primarily accessed training game, etc. (see Table 5).

Table 4.

If you use PC/notebook/tablet what do you do? (in %)

	Listen to music	Look for information	Watch videos	Social net-works	Prepay-ration for school	Watch or down-load movies or TV series	Chat, SKYPE	Play games	Write/ read e-mails
All the time	56.2	35.1	36.2	43.0	23.4	27.2	25.7	22.3	12.5
Some-times	29.4	51.3	48.3	34.3	52.8	42.6	27.2	32.5	30.2
Not often	10.2	10.9	13.2	11.3	19.2	22.3	26.0	24.9	43.0
Never	3.0	0.8	1.9	9.8	3.4	6.8	18.9	19.6	13.2
NA	1.0	1.9	0.4	1.5	1.1	1.1	2.3	0.8	1.1

Source: Own work

Table 5.

Factor analysis

If I use PC, notebook, tablet:	Factor	
	1	2
I listen to music	.739	.010
I watch short videos (You tube)	.732	-.161
I chat on ICQ, SKYPE	.596	-.034
I am on a social network site	.568	.273
I watch or download films or TV series	.523	.040
I search information	.135	.695
I prepare for school	.067	.671
I play games	.179	-.612
I write/read e-mails	.343	.374

Source: Own work

When comparing elementary school pupils and high school students, two great differences are visible. High school students are much more oriented on searching information and communication via social network sites. There is a smaller but still visibile difference in playing games and watching short videos – in this case, these activities are more often done by elementary school pupils.

Table 6.

Greatest differences between elementary school (ES) pupils and high school (HS) students in the types of activities , in %

	Searching information		Social networks		Watching short videos		Playing games	
	HS	ES	HS	ES	HS	ES	HS	ES
All the time	47.4	25.8	52.6	35.8	30.7	40.4	14.9	27.8
Sometimes	48.2	53.6	34.2	34.4	57.9	41.1	30.7	33.8
Not often	2.6	17.2	9.6	12.6	11.4	14.6	27.2	23.2
Never	0	1.2	3.5	14.6	0	3.3	26.3	14.6
NA	1.8	2	0	2.6	0	0.7	0.9	0.7

Source: Own work

The last part of the analysis is devoted to formal education, specifically home preparation. Interblending of traditional and new media is also visible in this area. Text books and computers connected to the internet are most frequently used for preparing for school. These two means are more popular than the other ones. The respondents spontaneously added other means of learning: learning from their own comments and notes. It could be said that combining text book, own notes, and PC connected to the internet is the most frequent way to prepare for school. When compared to high school students, elementary school pupils do not only prefer "new"media such as tablets or smartphones but also traditional media (books, television, newspapers, and magazines). This could be interpreted at least in two ways that support each other. Firstly, elementary school pupils are more of a "tactile generation" than current high school students. Secondly, their teachers reflect new technologies and new teaching approaches more[1].

[1] This is also supported by the research undertaken among elementary and high school teachers: elementary school teachers use new media more and their less conservative than high school teachers.

Table 7:

Formal education - preparation at home - what media respondents use and their ranking

	Average (all respondents)	Average (High school)	Average (Elementary school)	Difference between HS and ES
Text books	2.12	2.26	2.02	0.24
PC with internet	2.22	1.84	2.5	0.66
Books	3.96	4.14	3.82	0.32
Smartphones	3.96	4.45	3.59	0.86
Tablets	4.28	5.04	3.7	1.34
TV	4.5	5.01	4.11	0.9
PC without internet	4.75	5.00	4.56	0.44
Newspapers and journals	4.78	5.11	4.52	0.59
PC games	5.6	6.39	5.00	1.39
Spontaneous answers	Number of respondents			
Own workbooks, notes	44	28	16	
Parents	12	2	10	

Source: Own work

4.2 Digital immigrants: Teachers

According to the Czech Education Inspection (2013) ICT are not available only at 6,5% of Czech elementary schools. Using new media was noted by the Czech Education Inspection at 37,9% of the observed schools and in 21, 4% of cases these were simple presentations using ICT. In the other 16,5 % special software applications for teaching were used.

As the mirror research with pupils showed, the most used medium for teaching is still a text book. Text books are considered to be the primary teaching tool which is easily accessible by students. Teachers consider text books to be systematic and clear. According to teachers, text books are also very important for keeping contact

with written texts, which could be a problem in the future as children are used to reacting to audio and video impulses from the very early age. Under these circumstances, it is easy for teachers to use text books not only at school but also as a tool of home preparation of pupils (especially work books). High school teachers'attitudes are very pragmatic, containing no emotions. Textbooks are guidebooks for them and they use the term "necessity" with them. As far as disadvantages of text books are concerned, teachers generally worry that the books can contain outdated information. They also complain that students often forget the books (leave them at home). Elementary school teachers also often express their worries that the books are not attractive enough (some even say that they are boring).

Other traditional media are considered as supplements to text books. Newspapers are valued mainly because of dealing with current issues. Teachers consider them to be an attractive supplementary material thanks to photographs and infographics. Elementary school teachers appreciate the fact that texts tend to be short and allow students to deal with the world around them. They also think that thanks to the newspapers, it is possible to show pupils that the things they learn at school can also be used in real life. However, teachers are generally concerned about the objectivity of newspapers.

When it comes to books, different attitudes can be traced among elementary school teachers and high school teachers. Elementary school students consider books to be a great tool for developing the reader's literacy (in a general cultural and social scope). In high schools books are used as a tool for deepening knowledge in the relevant field. When viewed from the perspective of Czech language teachers, books are the objects of study. Books were the only medium which some teachers described as having no disadvantages. Other characteristic ascribed to books by teachers is that "books are not for everyone" from several perspectives: books are financially unaccessible, they are heavy, and not all of the students are interested in reading books.

Most teachers think of documentaries when asked about TV and films. They assign great value to the visual perception – for pupils and students documentaries can be more attractive and more interesting than reading. In this case, both media got similar evaluation of their advantages. Their main disadvantage is that it is only passive viewing.

According to teachers, the Internet is a fast tool for searching current information. Elementary school teachers use it more as an accessed entertainment tool, high school teachers use it for more serious purposes. Elementary school teachers also use more short videos placed on the Internet in their lessons. Main disadvantages of using the Internet in the lessons are technical problems with the connection, and the overoload of information, which is often unreliable and superficial. If pupils use it directly in the lessons, browsing the net could weaken their focus. High school teachers were more concerned with objectivity and accuracy of information.

A personal computer without internet connection is actually an anachronism now and is mostly used for creating materials or viewing materials, however, it needs to be connected with a dataprojector.

Elementary school teachers mostly said very positive things about the interactive whiteboard (these are probably used more often at elementary schools than at high schools). High school teachers mentioned only a few advantages. This could be interpreted that they perceive IBoards as a tool where the form (funny and accessed taining) exceeds the content. On the other hand, the fact that interactive whiteboards are accessed entertaining is greatly appreciated at elementary schools. They also value the possibility to engage pupils and use the whiteboard for practising and demonstrating. Teachers also appreciate easy operation. Only a few of them feel reserved about using it in the classroom.

According to high school teachers, the main disadvantage of interactive whiteboards is their price and the fact that these are not installed in every classroom. Elementary school teachers are more specific in their comments. From their perspective, the greatest disadvantage is the fact that they cannot engage more than one student into working with the interactive whiteboard (plus there is not enough time to give everyone a go) and thus there is certain passivity included.

PC games are not used very often. Teachers consider them to be useless as students spend enough time with these in their free time.

Generally speaking, most teachers are quite indifferent to using tablets. We received only a few reactions to their use. The main advantage is their compactness and possibility to carry it around. Another advantage is saving paper. Its attractiveness also plays a role. Among its disadvantages (only a few were mentioned) is its high price. Considering the offical debate on using tablets in the classroom, it was quite surprising to receive only such a small number of reactions.

5. CONCLUSIONS

It is visible that elementary school pupils are the ones who represent the tacticle generation as such but from the perspective of educational sources (at school and out of it) it is not solely them. When educating pupils and students, various media interlap. More specifically, their usage has different intensity. However, new media coexist with those traditional ones. For example, listening to radio is diminishing. Current tactile generation listens to music and programs via various internet services, often interconnected with social networks. The importance of tablets is growing. At the moment tablets are used more often by elementary school students. On the contrary, television, especially as the form of accessed entertainment, is still very strong among elementary school pupils as well as among high school students.

Due to fast development of new technologies, it is very difficult to estimate further changes in education. Currently, many educational thought leaders argue that

schools should be providing ways for students to continue to engage in learning activities, formal and informal, beyond the traditional school day with using online media. In the future classrooms, we can expect a rapid growth of using intuitive (touch) tools such as "smartphones and tablets, Xbox Kinect, Nintendo Wii, the new class of "smart TVs" and a growing list of other device built with natural user interfaces (NUIs) accept input in the form of taps, swipes, and other ways of touching; hand and arm motions; body movement; and increasingly, natural language (New Media Consortium 2014: 3) Considering the results of Czech research, these predictions may seem a bit futuristic as they are talking about very near future. We might see in what ways these come true quite soon.

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INFORMAL LEARNING AS AN INTEGRAL PART OF E-LEARNING ENVIRONMENT OF THE MODERN EDUCATION

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Abstract: *In modern society there is a clear trend of increasing the part of informal learning that should be considered to be an indicator of qualitative self-development and competitiveness of the employee in the labour market under current conditions. Because unlike traditional formal learning, it is able to fully take into account the personal needs of people and promotes quick and convenient knowledge, the quality of which depends on the student's ICT and creating a comfortable environment for personal fulfillment of their own activities.*

Keywords: Cloud computing, personal educational environment, network services, formal, informal and non-formal learning, Project IRNet.

INTRODUCTION

The 21st century is the century of high computer technology, innovative economic development, global information, and intensive development of communication, a rapid social and economic change.

Modern educational process involves the use of advanced ICT, including network services that are gaining wider popularity among the users and significantly affect the communication between students and teachers. New information and communication technologies make it possible to create powerful educational environment, fast-growing, erasing the boundaries between traditional formal and informal learning, and subject to such conditions for successful e-learning important knowledge of modern technologies Web 2.0, which can be used for the creation and transfer of knowledge at a distance.

1. INFORMAL LEARNING AS AN INDICATOR OF QUALITY SELF-DEVELOPMENT AND COMPETITIVENESS

The development of informal learning related to the rapid development of e-learning - the forerunner of informal learning, increased innovation in business, productivity enhancement. Informal learning by Malcolm Knowles (1970) is the study, which is embedded in planned activities, but obviously not intended in terms of objectives, time and support, and contain an important element of learning (Glossary CEDEFOP). Informal learning is required from the student perspective and leads to certification.

A study conducted by Cisco, which was attended by 2800 students and young professionals from 14 countries under the age of 30, indicates the main problems facing employers today while trying to balance the needs of the business and the needs of wage-workers (What do employees of Y generation want?, 2011).

This study revealed the desire of university students and young professionals to work in an open environment, which provides access to the Internet using a variety of electronic devices, as well as the opportunity to work remotely, it's their lifestyle requirements and conditions necessary to create their innovative ideas.

Another world-leading American integrated media company MediaTec Publishing Inc., which deals with the use of human resources management and training of qualified personnel in their research notes that the trends of the modern labour market require skilled workers' indispensable increase in the share of informal learning for high-quality self-development and competitiveness (West 2011). Forward-thinking companies understand that studying at universities and corporate training plays a major role in shaping the competitive specialist, but unfortunately, formal training is not able to take into account all the specifics of professional training future employees, and lays the foundation for further self-development and practical mastery of a profession. Important role in the growth of informal learning plays it every employee that provides a number of advantages of modern business, where, to date, valued new innovative approaches, interesting ideas, comprehensive awareness and mobility specialist, high level of PC, mobile devices and other modern gadgets as well as Internet technologies that are essential for maximizing success.

Unlike traditional formal learning, informal learning takes into account individually oriented human needs and promotes quick and convenient knowledge at any time and in any place. Some experts claim that 80% of knowledge is acquired through informal learning and accumulation of knowledge occurs primarily through collaboration to work or school, making use of informal learning ideal means to maximize the use of training activities.

The model support of informal learning (OODA) (Strategies for Creating Informal Learning Environments, 2010) includes four components: observation, orientation, decision and action, and is realized through a personal learning environment.

2. RELATIONSHIP OF UNIVERSITY'S AND STUDENT'S ELECTRONIC EDUCATIONAL ENVIRONMENT

Synthesizing the definition provided in the online sources (Anderson 2006, Chatti 2007a, Chatti 2007b, Fitz-Gerald 2006, Materials from the meeting of the working group on harmonization of training IT specialists with higher education requirements of modern IT-industry 2013, Wheeler 2010a, Wheeler 2010b) we can say that PLE (Personal learning environment) is considered to be a system that allows a person who learns to set their learning goals, monitor and manage their own content and process learning, and communicate and collaborate with others in the learning process, do informal learning. PLE determine such tools and services that are separate educational platform for use in learning and achieving educational goals.

In our opinion, Personal learning environment (PLE) is a collection of electronic content and advanced web services and applications, which are based on individual electronic educational platform and content management of electronic communication, cooperation and solving educational and research problems, and providing an opportunity for students to set learning goals and manage their own process monitoring academic progress and, on the basis of portfolio form own e-learning space, create own e-library, make and publish educational and scientific project activity and so on. This multifunctional of PLE will enable the student to efficiently and effectively acquire knowledge in the formal, informal and non-formal studies using modern cloud and web technologies and open educational resources. A free student access to their own educational electronic resources from any computer or mobile device at any time and from any location will allow faster and easier to work with information, teaching and scientific data and information to plan work support communication and collaboration with students and teachers together to solve educational and scientific problems, and enhance the ability of educational and research activities.

Building a personal learning environment (PLE) is based on the use of cloud technologies (SAAS- Software as a Service), which include such best (Hart Jane, 2013): Twitter (1st place), Google Docs (2nd place), YouTube (3rd place), Google Search (4th place), Evernote (virtual notebook) (6th place), Dropbox (file storage) (7th place), WordPress (blog, website) (8th place), Facebook (9th place), Google+ & Hangouts (10th place), Moodle (11th), LinkedIn (12th), Skype (13th), Wikipedia (14th), Prezi (15th place), Google Scholar (35 place), Coursera (38th), Skydrive (43 place) and so on.

PLE is the result of the evolution of Web 2.0 and its impact on the educational process. Access to education is access to resources and services and allows students **not only to use educational resources**, but most importantly - **create them**. Education thus becomes the transmission of information and knowledge to create them. Feature of PLE is a tool that allows students to participate in a distributed environment consisting of a network of people, services and resources. PLE - is not

only a comfortable environment for the activity, but a means of creating a personal learning network where you can collaborate not only with direct subjects of the educational process, but also their communities to significantly expand the circle of friends, to go beyond the formal communication and get much more professional information.

PLE designing depends on the quality of the educational process, taking into account its use - it should be simple and effective. Selection tools of PLE - is a personal right of every student, it depends on its level of ICT competence, which should continue to grow and replenish the knowledge and skills to use new social services. That is why one of the objectives of the university is in constant development of ICT competencies of students through the use of new social service teachers in the learning process and the introduction of relevant corporate standards, including tools of PLE as a student and teacher.

To the minimum set of PLE tools, according to the researchers should include twitter, ning, blog, igoogle (netvibes), reader RSS, delicious (DIIGO), wiki (Kadle 2010).

PLE allows creating personal learning network and managing knowledge (Kukharenko 2013). According to Siemens (Siemens 2011) this is the most effective system for knowledge management.

In our opinion it is expedient tools PLE group in the core activities of students in the learning process: organization, search, publication, collaboration, communication, cloud storage services (see Table 1).

Now, given a list of the most popular tools (Hart 2013, IRNet project 2014, Kommers et al 2014, Smyrnova-Trybulska et al 2014), we can distribute them according to the following classification, which can be regarded as a model of student's PLE.

Table 1.

Classification of the most popular tools for activities

N	Group of tools for students	Name of tool	Popularity
1.	Organization	Moodle	11
		Edmodo	29
		Coursera	38
		Khan Academy	41
2.	Search	Google Search	4
		Feedly	19
		Google Scholar	35

		Google Maps	70
		Google Translate	77
3.	Publication	YouTube	3
		Services of sharing images: Instagram, Picasa, Flickr	52
4.	Collaboration	Evernote,	6
		OneNote	69
		Google Docs	2
		Wikipedia	14
		Adobe Connect	30
		Blackboard Collaborate	66
		PB Works	74
		Popplet	76
5.	Communication	Social Network:	
		Facebook	9
		Google+ & Hangouts	10
		Twitter	1
		LinkedIn	12
		Yammer	20
		Email	32
		Skype	13
6.	Cloud storage services	Skydrive	43
		Google Drive	2
		Dropbox	7

Source: Own work based on the annual list compiled by Jane Hart from the votes of learning professionals worldwide,2013

Today each self-contained educational institution of Ukraine creates and develops its own e-learning environment - university portal, which is the basis of formal education of the student. Analysis of e-learning environments of modern domestic and foreign universities demonstrates rather high level of qualitative and quantitative indicators of implementation of electronic resources for educational purposes. The default for all universities is the fact that creating an electronic learning environment they rely on scientific and educational aspects of the life of the student, while individual needs are ignored. Consider an e-learning environment of the modern

university as an example of the Borys Grinchenko Kyiv University (Figure 1). From this example shows that despite the relatively high level of organization and content of a university portal, personalization student does not occur, and the creation and implementation of personalized e-learning environment of the student, which in turn is based on the personalization in a global network, student-centered learning, which acts as a basis for the formation of ICT and key competencies of the modern student, remains open. To open this question must match content-structural model of a typical e-learning environment universities and educational vision of personal space of student.

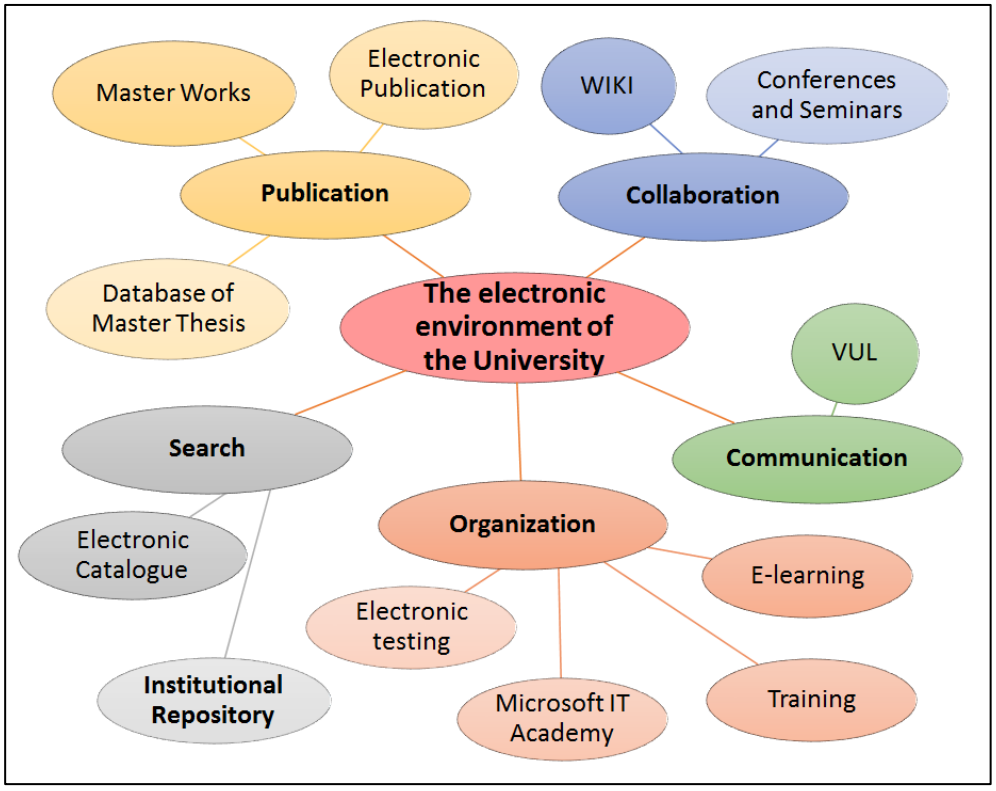

Figure 1. A typical e-learning environment of the modern university

Source: Own work

During development of personalized e-learning environment of the student must take into account not only the needs of students who appear for formal training, but also the needs of students who are needed in the informal and non-formal learning. Following some simple calculations, we can say that the modern student - a young people aged 17 to 25 years, as they are called, representatives of „Y" and „Z" generations. Representatives of these generations have qualitatively different values and skills, unlike their predecessors, they have grown up with the Internet and cannot imagine their life without mobile devices, electronic organizers and

computers. The main feature of „Y" and „Z" generations **is phenomenal ingenuity, they are fluent in all types of work, with many promising ideas and do not create yourself an idol**. This youth, who demands the individual approach to learning and committed to self-development to stand out with similar mass (Schroer 2014).

Transition of Ukrainian educational system to the paradigm of the XXI century "education for life", increasing popularity of distance education and implementation of the learning process of universities of the European Credit Transfer and Accumulation System (ECTS), in its provisions provides for individual and independent work of the student, depending on content of the course and the specific activities of the student, from 25% to 60% of the hours dedicated to the mastery of certain subjects (European Credit Transfer and Accumulation System). This significant percentage cannot be left unattended as object and subject of study. And it allows the student to effectively acquire knowledge during formal, informal and non-formal learning independently manage content and electronic communication, cooperation and solve educational and scientific problems, and provides an opportunity to establish learning goals and manage their own process monitoring academic progress, and, on the basis of portfolio form your own e-learning space.

CONCLUSION

Each modern self-sufficient university should consider educational trend increase in the share of informal learning, as well as to identify the interests of their students, realize their desire personification in the global network and student-centered learning, which in modern terms, acts as a basis for the formation of ICT and key competencies of the student.

Although the analysis of typical university e-learning environments demonstrates rather high level of qualitative and quantitative indicators of implementation of electronic resources for educational purposes, one cannot ignore the fact that the university portals cover only scientific and educational aspects of student life, and remain out of sight of his individual needs. It is one of the priorities of the university is in continuous development of ICT competencies of students and teachers by creating and implementing personalized e-learning environment, the use of new social services in the educational process and the introduction of relevant corporate standards.

ACKNOWLEDGMENTS

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III. PRACTICAL ASPECTS OF DISTANCE LEARNING. DISTANCE LEARNING IN HUMANITIES

E-LEARNING IN CULTURE STUDIES INSTRUCTION – DESIGNING, IMPLEMENTING AND EVALUATING A STUDY PROGRAMME

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Abstract: *The aim of the article is to reflect upon the process of designing an online course aimed at familiarising foreign language learners with the basics of culture of target language countries, which are often the destination of Erasmus mobility visits. The course "NIE TAKI ERASMUS STRASZNY…" (Don't be that scared of Erasmus…) was targeted at students planning to make a foreign visit within the Erasmus+ framework, who have achieved the necessary proficiency level and who are willing to expand their intercultural knowledge and skills to accommodate better to a new linguistic-cultural reality. The paper is composed of three main parts, which contain reflections on the design of the course, a detailed discussion of all the stages of its development and the final evaluation of the course reviewer.*

Keywords: e-learning, foreign language teaching/learning, developing Intercultural Communicative Competence, *Erasmus+* programme

1. INTRODUCTION

Erasmus+ programme, which continues the well-known *Erasmus* framework over the years 2014-2020, is one of the most recent schemes approved of by the European

Parliament for "education, training, youths and sports". One of the challenges it faces is "developing social capital of young people, strengthening their position and abilities to participate actively in the society, according to the regulations of the Treaty of Lisbon towards 'encouraging youths to participation in democratic life of Europe' (European Commission, 2013: 9). The implementation of this objective in member states of the European Union can have different forms. The one point in common is setting up partnerships between particular EU higher education institutions and organizing student exchanges within these partnerships.

Ever since the *Erasmus* (currently *Erasmus+*) framework was introduced, the opportunity to follow a part of one's study programme at a foreign university has been highly appreciated by Polish students. Many of them found such a visit the first occasion to get in touch with authentic use of a particular foreign language in natural communicative contexts. In fact, this demands not only confident use of the target language system, but also knowledge and skills of using the rules of its social and cultural functioning. Thus, providing students who are planning an *Erasmus+* trip to English- or French-speaking countries with information and skills within this area has become the main objective of the course *NIE TAKI ERASMUS STRASZNY…* The course was designed as a collection of open-access e-learning modules within the framework of *UPGOW – University as a Partner of a Knowledge-Based Economy,* realized by the University of Silesia and funded from the European Union.

2. DESIGN OF THE COURSE

The implementation of e-learning as a method of teaching and learning foreign languages, in its broad sense, has become a highly popular solution among teachers willing to enrich their foreign language teaching toolkit. On the other hand, as far as students are concerned, getting access and exposure to multimedia teaching aids designed specifically for foreign language study has become a widespread way of improving foreign language proficiency. Moreover, availability of a wide range of computer-based and online educational tools facilitates authoring different forms of interactive resources (ranging from single quizzes to fully-fledged e-learning courses). These are varied not only in terms of forms and methods of work, but also selected contents, use of authentic language input and wide context of the target culture.

The course *NIE TAKI ERASMUS STRASZNY…* is one of the examples of how to apply the methods and techniques of distance learning in foreign language teaching and learning. It has been designed for intermediate+ students (B2 or higher according to Common European Framework of Reference levels, CEFR, 2003). As is the case with other language courses, one of the main objectives of the course is the development of linguistic and communicative competences at a selected level. The course focuses, apart from that, on fostering intercultural competence within the target language. It is on purpose that ICC is the starting point for both course

syllabus and its specific contents since, as evidenced by contemporary researchers (see, for instance, Mackiewicz, 2005 or Wilczyńska, 2009), intercultural competence, also known as transcultural competence, is regarded as a key to successful communication in a foreign language. Without it, "effectiveness of TL communication can be hindered" (Mackiewicz, 2005: 10). Generally speaking, intercultural competence is viewed as "the ability of a learner to behave appropriately and skillfully in contact with actions, attitudes and expectations of representatives of foreign cultures" (Banach, 2003: 3). Thus, it encompasses not only linguistic competence as such (or, according to the CEFR terminology, 'linguistic communicative competences'), but also so-called 'general competences', which are connected more or less directly with the language itself and are applied by its users in diverse everyday life situations. General competences encompass a wide range of knowledge, practical skills, individual personality factors or learning skills (see CEFR, 2003). Out of all the above-mentioned factors shaping general competences the ones that seem to have the greatest impact on the development of intercultural competence seem to be the following:

1) sociocultural knowledge – viewed as 'knowledge of the society and culture of the target language community',
2) intercultural sensitivity – defined as 'knowledge, awareness and understanding of relations (similarities and differences) between the source language community and the target language community',
3) intercultural skills, encompassing "the ability to bring the culture of origin and the foreign culture into relation with each other"; "cultural sensitivity and the ability to identify and use a variety of strategies for contact with those from other cultures"; "the capacity to fulfil the role of cultural intermediary between one's own culture and the foreign culture and to deal effectively with intercultural misunderstanding and conflict situations" as well as "the ability to overcome stereotyped relationships" (CEFR, 2001: 104-105).

Thus, if we are to sum up the discussion above, many researchers see the concept of intercultural competence as "a perfect knowledge of target language and culture" (Wilczyńska, 2005: 22) and attribute to it a major role in all sorts of contacts between native and non-native users of a particular language. The latter, for instance, may fail to apply the form of the linguistic message to the status of the interlocutor, which results in restricting or even abandoning interaction with such a person. Lack of knowledge of certain patters of behaviour characteristic of a particular culture or the reality of using a given language can lead to misunderstandings, communicative and interactive mishaps. This, in turn, can trigger fear of interacting in the target language or even apprehension in contacts with specimens of the target culture.

These are the reasons why developing intercultural competence has become one of the most essential components of contemporary foreign language methodologies and

has gained great prominence in situations in which a learner is going to face the necessity to use one's language skills in everyday life interactions within the target language community while becoming its member for a shorter or longer period of time. Such opportunities are brought about by *Erasmus+* visits, which require not only necessary language proficiency, but also familiarity with the basics of the reality of the target culture. Providing such information and giving opportunities for acquiring that kind of competence have been the foundation of the course *NIE TAKI ERASMUS STRASZNY…*. The course has been targeted at students planning a visit to English- and French-speaking countries. Thus, the focus has been placed on showing the cultural reality of the United Kingdom of Great Britain and Northern Ireland, as well as France, Belgium, Switzerland and Luxembourg. The major objective of its authors has become equipping course participants with information useful to adapt to and effectively function in the linguistic and cultural reality of the target community. The course contents encompass a wide range of areas of both public and private lives of a given community, as indicated during interviews with students of the Faculty of Modern Philologies of the University of Silesia who had participated in *Erasmus* student exchanges before. Based on the findings of interviews, nine thematic areas have been isolated as the backbone of the course:

a) geography and geopolitics,
b) social care system,
c) healthcare system,
d) education,
e) social etiquette and manners in the culture of origin and the foreign culture,
f) religion,
g) holidays and special occasions,
h) festivals and cultural events,
i) national and cultural heritage.

All these topics were selected for inclusion in the syllabus to organize the course contents.

3. COURSE DEVELOPMENT

The development of the course was implemented within the project "*UPGOW University as a Partner in Knowledge-Based Economy"* contract number UDA-POKL.04.01.01-00-215/08-00, within the Operational Programme Human Capital co-financed from the European Social Fund, Priority IV Higher education and science, Action 4.1 Strengthening and developing the didactic potential of the university and increasing the number of graduates of faculties with key significance for knowledge-driven economy, Subaction 4.1.1. Increasing the didactic potential of

the university within Activity 46: "Developing and implementing curricula and didactic materials in distance learning".

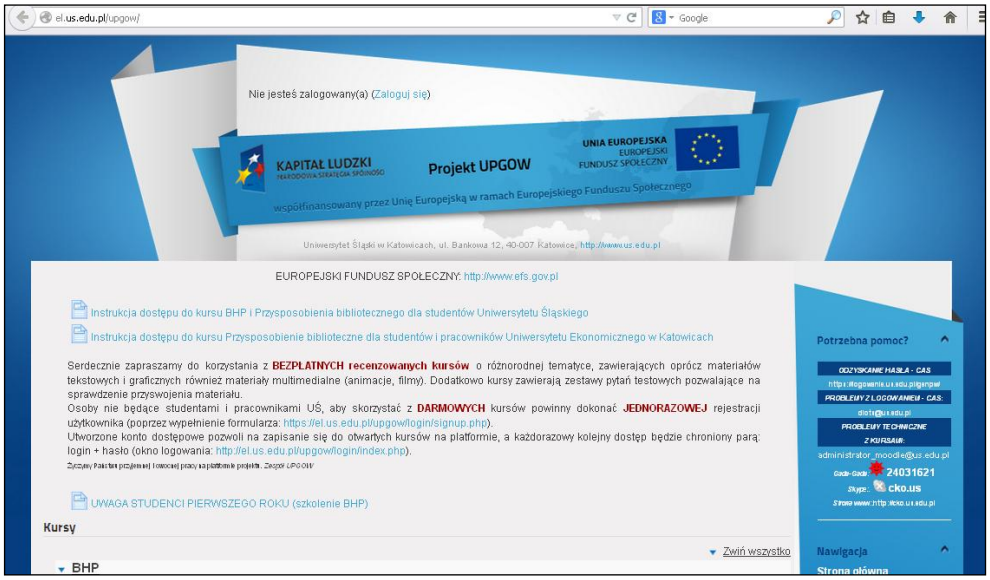

Figure 1. A screenshot from the UPGOW project platform

With such highly ambitious goals in mind, the course was planned to compose nine thematical modules (topics), each equivalent to 30 hours of effective student work on the platform. Each module was structured with a lead-in, pre-tests and tests, a glossary, varied input materials and learning activities. Each course was supposed to meet university standards and exploit the capacities of the e-learning platform, with a special focus on graphics, illustrations, pictures, training videos, together with the option of acquiring each part of the material in an interactive, varied and methodologically sound way.

The development of the course required making a bid for a didactic service in cooperation with the Public Procurement Division of the University. With a number of bidders competing, the winner was a consortium of companies PROFES and Edukacja.Online.pl, both with a wide experience of developing distance learning courses.

The course development process was divided into the following stages:

1. Detailed specification of topics within the designated thematic areas and thorough planning of lesson scenarios by foreign language teacher advisors.
2. On the basis of these, preparation of detailed guidelines for drafts of all the scenarios by e-learning methodologists.
3. Course upload to the platform by IT specialists.
4. Internal audit.

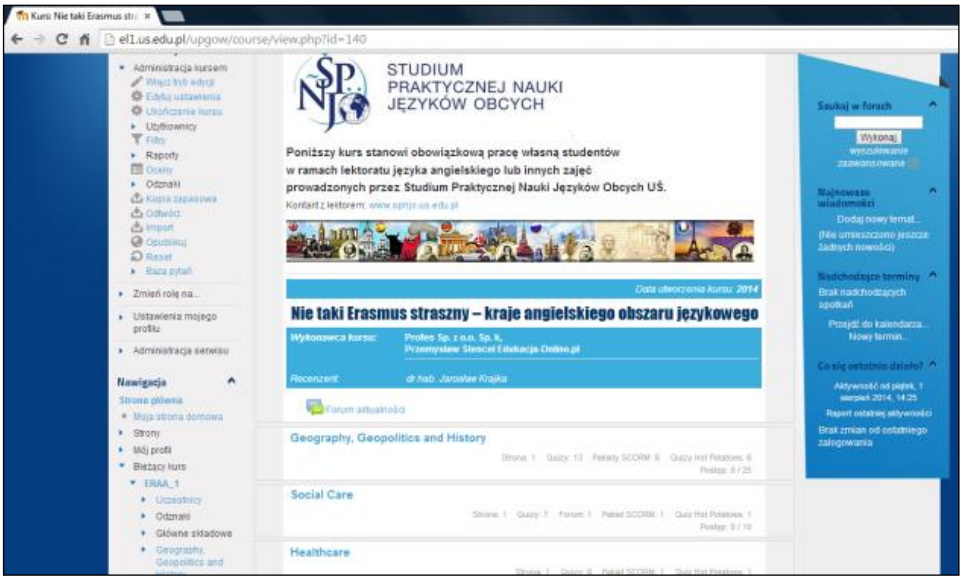

Figure 2. A screenshot of a title page of the course

The contractor was well aware of the fact that the ready-made course will be accepted only after a positive outcome of the methodological assessment by the external auditor commissioned by the University.

Apart from the language objectives directly related to the participation in the *Erasmus+* programme, the project team aimed at achieving the following benefits:

- *Increasing the attractiveness of the didactic offer of the University*

Most e-learning courses at higher education institutions are run in the blended learning mode and e-learning is used to supplement traditional face-to-face classes. This seems to be the right approach, as it combines maintaining the university tradition and direct relationship between the master and the apprentice with contemporary needs of youths accustomed to interacting in the cyberspace and gaining the knowledge of the world from the Web. Additionally, online availability of selected lectures can be a good promotional opportunity for a university by displaying examples of good practice, increasing students' awareness of e-learning and serving an important marketing purpose. The UPGOW platform has over 32,000 registered users, with more than a third using the resources actively. The users become more and more interested in the courses – for instance, in 2011 the portal was visited by over 48,000 unique users, in 2013 the number soared to 126,000. Over the first three months of 2014 the platform was visited by over 30,000 users. All this means that many students use resources of a number of different courses rather than just do a one-time course completion. When students register at a given module and see another appealing topic, they take up such elective courses.

- *Availability of resources with more and more prevalent online use beyond the University and the domicile*

The virtual learning environment is available regardless of the time of the day or place of residence of course participants, which is a significant benefit for extramural students or those who study two different faculties. Moreover, in the era of mobile devices one often uses the time of travel, commuting, relaxation or walking to study, acquire new information, revise or redo essential course components.

- *Learner autonomy in practice, given expected student skills*

Autonomy is a highly appreciated skill essential for fostering independence, self-control, good work organization. Thus, effective autonomy of students taking courses outside the University's premises or abroad is an absolute must. It is often the case that e-learning is a self-autonomous process under the facilitator's guidance, whose role is not limited to tutoring of all kinds, but also assists development of learners' creativity and personal development.

- *Support for participants with learning disabilities*

The virtual learning environment is available anytime and anywhere, moreover, each user can customise the layout of the course on their monitor to suit their perceptive abilities. Additional software can be used to read texts aloud. More and more challenged students use *Erasmus* study opportunities, and the contents of the described course features additional information relevant for such learners.

- *Creation of a quality model for future online courses*

The University of Silesia has 13 e-learning platforms (12 belonging to particular faculties and 1 inter-faculty one) set up before the UPGOW project commenced. The very project resulted in improving the quality of courses offered since many authors tried to follow the model standards established in the project. Quite a few authors of UPGOW courses used their newly acquired skills and experiences to expand the impact of their courses by uploading new resources to the faculty platforms and to the YouTube video sharing site. As evidenced by informal evaluative interviews with many authors, it was the UPGOW authoring experience that fully convinced them of the benefits of e-learning.

4. COURSE EVALUATION

The evaluation of an e-learning course takes into account the overall process of teaching and learning. In this respect an e-learning course serves a similar function to a foreign language coursebook – it is the final product of a number of decisions upon the shape of the learning process, the role of the learner, the degree of his/her autonomy, which all have to be taken by course authors in the moment of planning. It is due to this that the evaluation of the course „Nie taki Erasmus straszny – kraje

angielskiego obszaru językowego" takes into account the following aspects which add up to the methodology of teaching a foreign language at a distance:

- objectives and topics of the course,
- types of activities and ways in which lesson sequences are structured,
- roles of the teacher and learner,
- testing and assessment.

Obviously, the practical implementation of these four aspects is to a large extent influenced by the computer environment in which the course is to be designed (or, to be more specific, the e-learning platform selected to host the materials) on the one hand and the predicted mode of course application after its development on the other. Thus, the types of activities are determined by the capacities of a platform (either dedicated or ready-made, commercial or Open Source). The question whether more sophisticated, multi-staged, or multimedia-rich activities can be used depends on the degree to which the foreign language developers can influence the shape of the computer environment. The limitations of the selected platform can have a negative influence on the quality of the final product – in such a case language authors try to do what is actually feasible (or even worse, feasible and quickly done), not necessarily attempting to design activities and sequences that would be most effective at transmitting particular pieces of culture knowledge or could enable the development of given intercultural abilities.

4.1. Objectives and topics of the course

The course „Nie taki Erasmus straszny – kraje angielskiego obszaru językowego" was divided into nine modules, each comprising SCORM lessons, Moodle and Hot Potatoes quizzes as well as introductory pages:

1. Geography, Geopolitics and History
2. Social Care
3. Healthcare
4. Education
5. Manners
6. Religion
7. Holidays and special occasions
8. Festivals and cultural events
9. Heritage

The selection of topics well reflects the current understanding of culture as a concept encompassing both public institutions, items of geography, history, politics (termed 'big C culture' or 'achievement culture') and aspects of everyday life, with elements

of customs, habits, leisure activities, typical ways of travelling, to name just a few ('little c culture' or 'behaviour culture' – Stempleski, Tomalin, 1993). It is to be noted that in the evaluated course the latter area ('little c') gains prominence, which gives the course a more practical character and enables its users to acquire information necessary to function in everyday life in the target language countries. If this is to be the objective, the amount of detail needs to be significant (as it was in the case in the course), in order to exhaust the possible range of options.

The second decision to be taken in such a culture-oriented course, apart from the layer of culture to be addressed, is the geographical focus. In the course "Nie taki Erasmus straszny…" the authors narrowed down the concept of "English-speaking countries" to the parts of Great Britain (England, Wales, Scotland, Northern Ireland or Republic of Ireland). While this is fully justified given the possible Erasmus+ student mobility destinations, such a limited view of the target culture impoverishes students' view and attitude. There is no reason why such English-speaking countries as the USA, Australia, Canada, New Zealand or Republic of South Africa (all belonging to the 'Inner Circle' of the English language – Kachru, 1990) should not be used in such a course, perhaps not to go into details, but to use them in comparison to the UK.

The final question to be resolved while designing a culture-oriented e-learning course is whether it is going to pass on culture-related information ('teach culture') or deal with all the three components of knowledge, skills and attitude ('develop intercultural competence'). The former approach, prevalent in the evaluated course, might be insufficient in the current reality, well focused on encompassing learners with skills of comparison, discovery, curiosity and openness towards other cultures. Thus, enriching each module with 1-2 reading comprehension activities, where texts are supposed to expose students to particular attitudes which are parts of Intercultural Communicative Competence (Byram, Planet, 1999; Byram, 1997; Byram, 2008) would greatly increase the impact of the course.

4.2. Structure of modules, types of activities, lesson sequence patterns

Course modules have a uniform structure both in terms of titles of components and types of resources. In most modules the number of resources is similar, which should be the case. The major components of each module are as follows:

a. Introduction, with a brief listing of module objectives, a pre-test and a discussion topic,

b. Lesson, made up of a certain number of facts spread over subpages, together with multimedia, all compiled into SCORM modules,

c. Practice, with a considerable number of Moodle quizzes or HotPotatoes quizzes of different types (crosswords, gap-filling tasks, multiple-choice questions) exploiting multimedia (pictures or films) as prompts or input,

d. Final test, limited in terms of number of attempts (only 1) and time (10 minutes).

While this structure would be typical of a number of school subjects, a question arises whether foreign language study does not need a different approach, in which the whole module would be divided thematically into a few mini-cycles, each comprising all the elements listed above relevant to the topic.

The introduction is a vital part of each module, as a learner needs to find out in advance what objectives are to be achieved, what details he or she will learn, what kinds of texts or forms of work will be used in the module and how much time to devote to working with it. A pre-test serves the purpose of a linguistic-cultural warm-up, necessary to activate conceptual structures and lexical expressions relevant to the module topic. It is also useful to add a discussion topic that would further stimulate learner reflection. Introductions, however, were not uniformed, and seemed to be a rather underestimated part of the course.

The major part of the module was a series of a multi-page lessons structured as SCORM packages. The pages introduce aspects of culture-related knowledge supported by pictures, videos, maps or additional information in speech bubbles. Users make their way through the lessons, solving particular close-ended tasks (matching, true-false, multiple-choice) and moving to consecutive screens in a linear fashion.

While attractive graphic design and skilful integration of texts with multimedia elements are strong sides of the lessons, the linear mode of work is a drawback, since it assumes the only way to proceed to the next screen is by solving a given one no matter how many times one tries. A more realistic mode of work would be allowing only a pre-defined number of activity attempts, after which assessment of answers, feedback and solutions would be displayed and the learner could move on. Also some alternative ways of navigating throughout the course contents could be used, rather than only linear progression through the lessons.

Lessons mainly focus on what is relatively easy to design and test, which is reading comprehension for details – however, other subskills of both reading and listening would have to be catered for to give learners a fully valid learning experience. As can be noticed in the course, lessons in different modules show quite considerable differences in the amount of texts and expected language proficiency level. Amount of coverage of topics and language level should be established in advance and adhered to throughout the whole course, unless, of course, it has been decided that the language level will be slowly rising towards the end of the course. Similarly, uniform policy of picture-text display (which elements where, how large in relation to each other) or text assessment mode (short question after each screen or longer tests after a series of pages) established before the course and applied throughout helps to maintain its professional nature.

The practice component of each module comprises a large number of multimedia-rich quizzes of different kinds (crosswords, matching, multiple choice, true/false), well suited to the kind of tested ability. Obviously, great care needs to be devoted to make sure quizzes are structured in a uniformed way (meaningful titles, target-language instructions, unlimited in terms of time or number of attempts).

The process of learning in the course „Nie taki Erasmus straszny – kraje angielskiego obszaru językowego" proceeds in the automatic mode, with no place for a teacher or facilitator, and with no contact with other learners. This is evidenced in the selection of Moodle activities, namely, content pages, audio and video files, automated lessons and close-ended quizzes. While the automated modules are well-structured and fulfill their purpose in the course, a question arises whether not to add a limited number of communicative activities (e.g., a forum at the start and at the end, or a journal upon completion of the module), in order to engage learners in human-human interaction and humanize the learning process to a greater extent. Moreover, out of the range of Moodle activities the glossary could be added to form a reference material accumulated throughout the course and be always accessible for look up. This would help to organize knowledge better and give learners a much quicker access to culture-related data.

4.3. Roles of learners and teacher, testing and assessment

The course „Nie taki Erasmus straszny – kraje angielskiego obszaru językowego" was shaped as a self-study e-learning unit, with students' performance automatically graded. In this kind of course a student works with the materials, gives answers, gets them assessed and obtains feedback according to the predefined answer key. The role of the course designer, then, is to develop the materials, plan possibly comprehensively the range of responses to be given, add meaningful feedback messages and program the learning sequences.

The analysed course reflects this learning philosophy, varying different assessment modes based on the phase of the lesson. In the practice phase close-ended quizzes have an unlimited number of attempts and it is only the highest grade that is recorded in the gradebook. This enables the learner to retake the lesson as many times as is needed with no effect on the final grade, and, in this way, make sure the knowledge is internalized faster and is retained for a longer period of time. On the other hand, both the pre-test and the post-test have restrictions aiming at making the performance assessment more reliable. For the former, the number of attempts is limited to one only and restricted to a five-minute time limit. However, prior to the test the student is informed that the pre-test will have no influence on the final grade. On the other hand, the post-test can also be taken only once and has a time limit, but its results are recorded in the gradebook. While this distinction is appropriate to differentiate practice tests from pre-test and post-test, perhaps at least some of the practice tests in the module could use the average score assessment method. In this way, those students who need a smaller number of test attempts would be rewarded with a higher overall grade.

Obviously, the fully automated course mode necessitates heavy reliance on close-ended quizzes. However, since contemporary foreign language methodology emphasizes the concept of learner as a subject (rather than object) of assessment, suiting assessment techniques to learners' needs and involving them in the testing process could be accomplished by introducing at least some of the forms of alternative assessment to the course „Nie taki Erasmus straszny – kraje angielskiego obszaru językowego". Contemporary Learning Management Systems such as Moodle offer a wide range of activities allowing the use of peer-assessment or self-assessment in the learning process (see Krajka, 2007; 2008; Marczak, Krajka, forthcoming). For instance, students could be involved in cooperating by assessing one another's posts in discussion forums, giving feedback on glossary entries or exercising self-assessment by filling a survey, writing journal entries or taking untimed and ungraded quizzes. While it might not be fully feasible to apply peer-assessment in a self-study e-learning course, providing opportunities for self-assessment would encourage the student to relate the knowledge, skills and attitudes gathered during the module to the objectives stated for it. At the same time, using journal writing systematically at the end of each module would help students develop written communicative competence, but also, what is more important, trigger reflection on the process of acquiring intercultural competence and expanding one's critical awareness. Skillful selection of topics and formulation of intriguing questions could also encourage learners to undertake a comparison between home and target cultures so as to acquire skills of interpreting and relating, skills of comparison, skills of discovery and interaction (Byram, 1997).

5. CONCLUSION

The course „Nie taki Erasmus straszny – kraje angielskiego obszaru językowego" answers a great need for teaching resources aiming at developing Intercultural Communicative Competence in foreign language instruction. A well-designed and neatly developed course is a valuable supplement to regular skill-oriented learning. While the limitations of the computer environment necessitate reliance on certain types of learning and testing tasks, future courses of this kind could be more flexible in terms of modes of use: self-study or teacher-guided, individual student-computer interaction or student-student interaction mediated by the computer. This could be done by expanding the range of communicative activities (forums, collaborative glossaries, individual journals). Also redefinition of the objectives would be necessary to address all the three major components of intercultural competence (knowledge, skills and attitude), without overemphasizing knowledge only. Once all these aspects are addressed, it seems such Erasmus-training courses would be a highly valuable element of practical education helping to function effectively in the everyday reality of a foreign country.

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STUDENTS' PREFERABLE ACTIVITIES IN E-LEARNING. A COLLECTIVE CASE STUDY

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Abstract: *Distance learning through different activities may develop users competences. In order to investigate what activities are offered to users, tasks ~~which were~~ included in open courses, and those made available by the University of Science and Technology (Poland), Massachusetts Institute of Technology (US) and Chiang Mai University (Thailand) have been examined. It turned out that the best developed interactive tasks were included in the courses provided by CMU, offering their applets to primary and secondary schools. Courses provided by MIT present the biggest amount of knowledge, but are non interactive and they lack instruction in case of the user's error. Resources of CMU allow to consolidate basic skills indicating the gaps in users' knowledge and refer to cultural context.*

Keywords: *interactivity, open resources, cultural awareness, citizen science, Long-Life Learning.*

INTRODUCTION: THE PURPOSE AND METHOD OF INVESTIGATION

Between 1-5 August 2014 three sets of open online resources were investigated in order to pay attention to the activities provided for users by European, American and Asian universities[1]. Their type was specified (quiz, test, crossword, assignment, forum, project etc.), possible interactions between students, and between students and the teacher. In order to avoid subjectivity and compare the results obtained for different series of courses, quantitative research methods were used. However, they

[1] According to the rankings of the best universities UST comes sixth in Poland (Ministerstwo Nauki i Szkolnictwa Wyższego), MIT ranks 7. In the USA („US News"), CMU is on the sixth position in Thailand („International Colleges & Universities").

have been associated with the quality method in order to interpret details and the data.

1. THE RESEARCH MATERIAL

Into account were taken:

1. "Open AGH" resources: 116 open courses in 19 categories. From 1999 *E-Learning Centre of UST* organized competition *Notatki w Internecie* (*Notes on the Internet*). Students develop interests publishing a course under the guidance of their teachers. Hyperlinks to the best solutions are placed on the MOODLE Platform and form a *coherent whole, which fulfills specific learning objectives* ("Konkurs..."). Courses form open educational resources. An edition for pupils was launched in 2008, one for teachers was launched in 2009 and one for doctoral students was launched in 2012.
2. "MIT Open Course Ware" resources have been complete since 1995. Now they include 2860 open online courses in 38 categories (mostly blended learning). They are placed on website, so their interactivity is very limited. The courses have being created by lecturers and their assistants, and they also contain projects – clues how to make unique products and photographs of products done by students.
3. "CMU Online" – 25 applets for English, 86 for biology, 64 chemical, 26 in area of physics. Mathematics is elaborated most exactly (138 learning objects). They were developed in the period between 2002 and 2007 in collaboration with UNESCO. Subtitles in English in 282 of them allow one to use them in national programs: mathematics-English language (Sil-Kamnuan), science (Wit-Kanit), and many countries, because material(s) are suitable for use in Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand and Viet Nam.

2. PROVIDED ACTIVITIES

2.1 UST

Almost half of the courses proved to be repositories of materials. They contain texts, calculations, graphs, animations, photographs and videos. Users' activity was limited to opening and viewing the resources. Some of the courses include only a printed guide in a PDF version. Most courses (98%) have been designed as a hyperlink to a website with further hyperlinks. Therefore, it was difficult to place interactive exercises on websites.

36% of the courses included quizzes, but in 8 courses they were inactive. It follows that the developing of the quiz is difficult and too time-consuming for almost half of the brightest students and caused technical problems. Most of the quizzes consisted in automatic counting of the percentage of correct and incorrect answers, but they did not provide feedback.

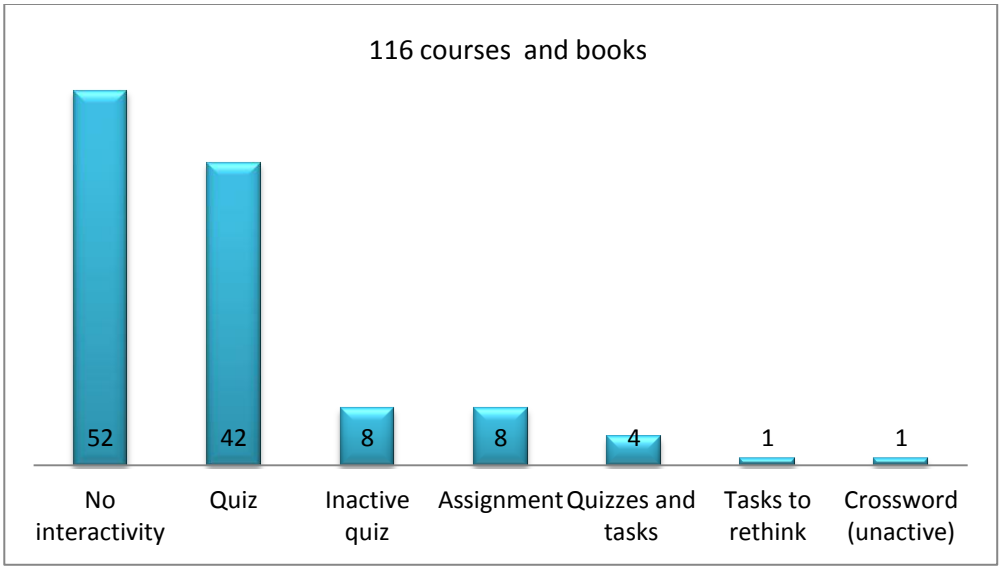

Figure 1. Types of activity in courses of University of Science and Technology

Source: own work

8 courses contained assignments to solve. This way of checking knowledge was familiar to students from the classes. The assignments were developed most as textbooks: when the user clicked in a window or opened a separate page, the correct solution appeared. Therefore, the errors committed by the user were not commented on. Only one course (*Materials Laboratory in the Subject Environmental Protection Technology* by Karina Molf) contained hints: hyperlinks to the relevant portions of the theoretical part of the course, when the response was incorrect.

Four courses contained quizzes and tasks. In *Notes from English*, questions from examination papers were presented in an interactive format. A competent use of technology made it possible to project the questions checking the various parts of teaching material, tips, comments, feedback. Many courses contained quizzes, however, in the form of non-interactive .pdf files, often without the correct answers. They were not taken into account.

In the course *E-Physics* the authors proposed among others: *say aloud or write on a sheet the definitions of basic concepts, such as mass, momentum, force. Can you also write the appropriate patterns?* The authors meant to present the knowledge in the user's own words. However, they could include tips and assessment.

The only crossword was prepared by Maciej Celejewski from XI Middle High School and probably a candidate for a student, the author of the course *Multimedia in Practice*. However, a hyperlink to the crossword does not work, probably due to incorrect implementation from the external program *Hot Potatoes*.

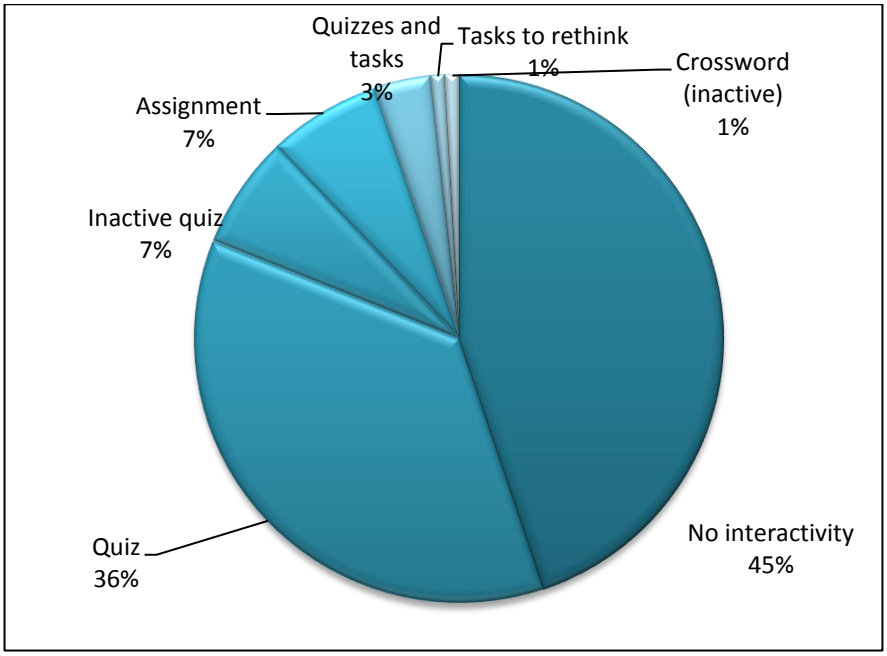

Figure 2. Percentage of activities – University of Science and Technology

Source: own work

2.2. MIT

The most interactive were courses from the collection "OCW Scholar", for example: *Fundamentals of Biology, Introduction to Psychology, Introduction to Solid State Chemistry*. Each of them contains rich resources, forums and quizzes or tests with answers.

The courses were connected with new technologies, for example: *Space System Engineering, Biomedical Information Technology, Economic Crises, Engineering of Nuclear Systems*. Most of them supplement classes, so frequent activities (assignment, project) are developed in the Institute. The user can only browse resources.

Forums were common for all courses in collection, e.g. biology, computer science, economics. They were active and still supplemented in new posts.

Most quizzes take place during classes. Interactive quizzes were implemented only in two courses: *Intermediate Japanese, Kana* (element of *Intermediate Japanese* and separate course). The reaction to the user's error was *Sorry, try again* – without clues or indicating the correct answer.

Information on the main site does not contain all students' activities. Some courses contained, for example: *a daily journal, to be turned into a weekly activity via email*

(*Sites in Sight: Photography as Inquiry*), *e-learning site* (*Special Problems in Architecture Studies*), but there were no hyperlinks on the site.

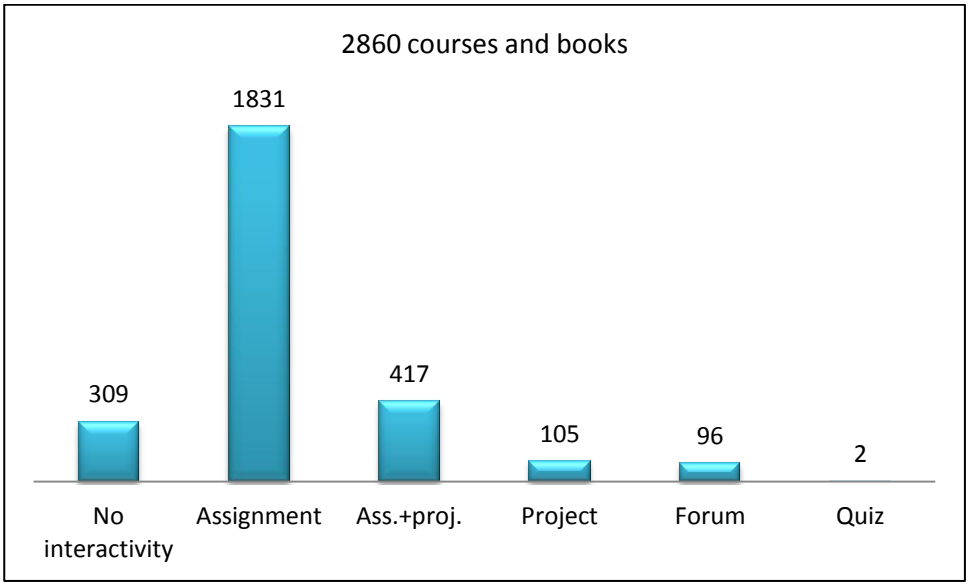

Figure 3. Types of activity in courses of MIT

Source: own work

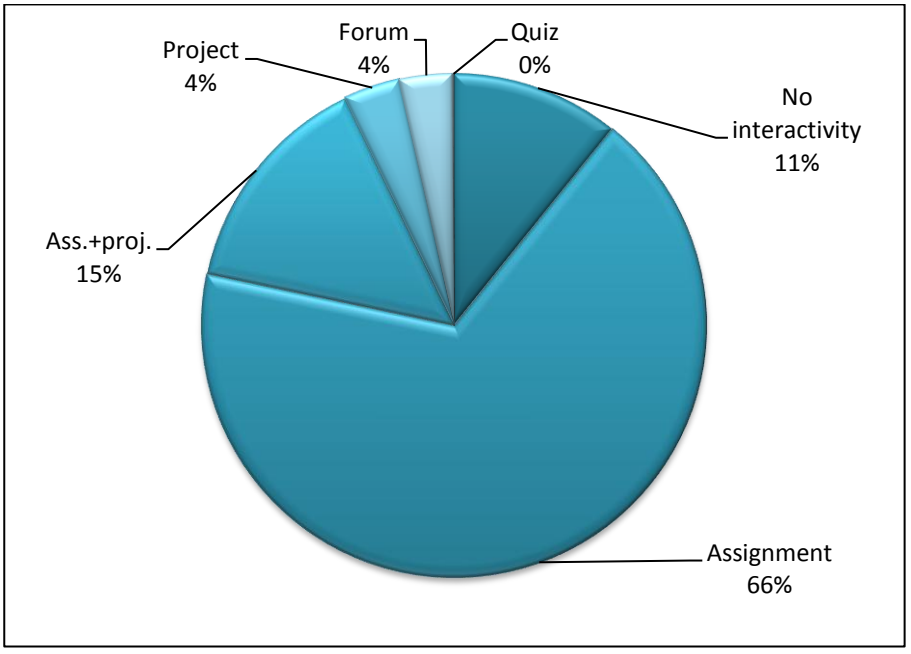

Figure 4. Percentage of activities – University of Science and Technology

Source: own work

Tutorials, tips, assignments and information about projects help students to prepare for classes and are important for independent learners. However, there is a lack of interactivity. Online resources document work in the Institute. It is unlikely that the user alone will complete a difficult assignment or execute an expensive project. 61 of the courses are online publications: textbooks or video books.

2.3. CMU

341 applets were examined, lessons and short courses (additionally for 28 a password was needed – they were not taken into account). Almost every resource contained film or animation, prepared with the intention of showing, for example, terraforming, flow of blood or circulation of electrons. Popular were quizzes with hints in the case of the incorrect answer. Matches were provided especially for elementary school and biology. Chemical servlets contained slider, which changes the temperature or time, allowing watching the reactions. Moving, adding or matching are designed in almost every applet in biology, math or English. Special activities were: shooting to numbers that are not perfect squares, formulation of hypothesis, entrusting pupils with the care of trees.

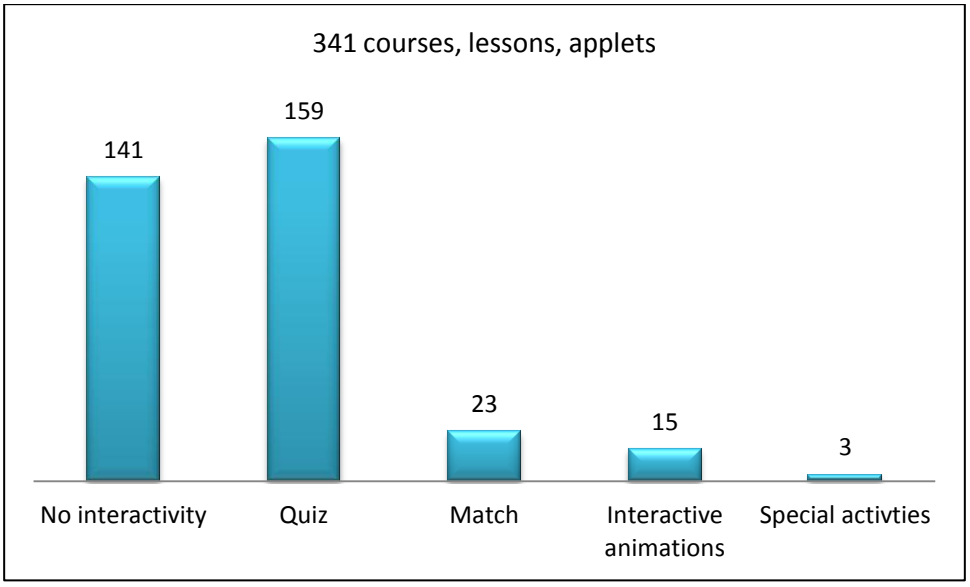

Figure 5. Types of activity in courses of Chiang Mai University

Source: own work

41% of the courses contained no interactivity beyond the opening hyperlinks. 54% contained interactivity (quiz, match) and clues how to solve the problem. Responses were immediately rated and adequately commented on.

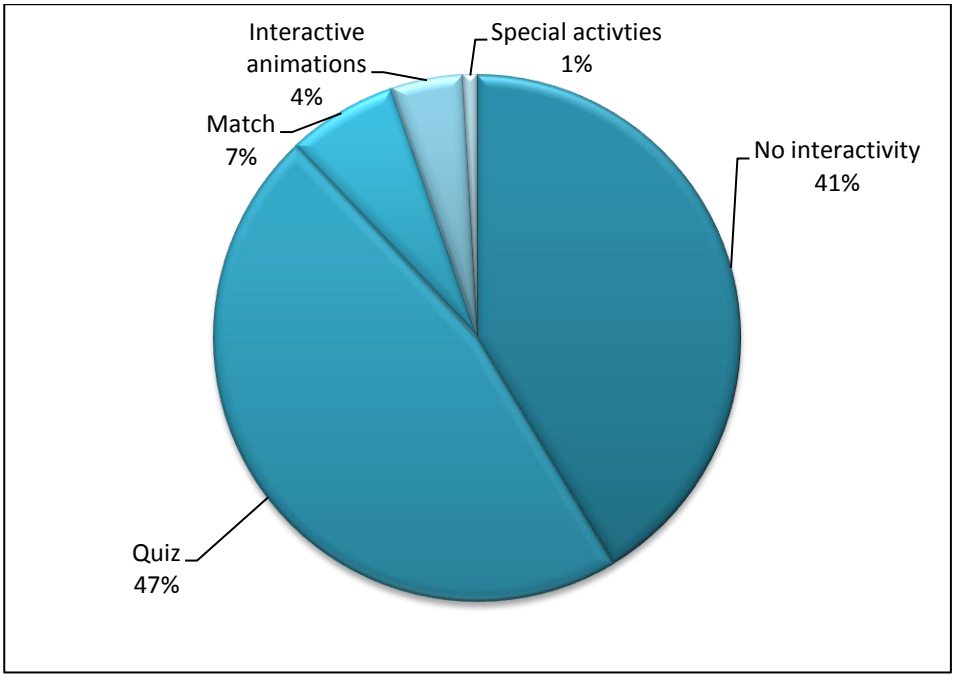

Figure 6. Percentage of activities – Chiang Mai University

Source: own work

3. COMPARISON AND COMMENTS

3.1. Technologies

Resources were prepared in different technologies.

Table 1.

Technologies for distance learning

Institution	Technology
University of Science and Technology	MOODLE + websites
Massachusetts University of Technology	Websites
Chiang Mai University	Website + Shockwave Flash (Small Web Format)

Source: own work

The Internet gives many possibilities to interactive learning. However, in the surveyed resources few of them have been used. The didactic quality of Computer

Mediated Communication and interaction with the user have been developed in a very different way, especially in the case of MIT.

3.2.Response to the user's error

It is informative to confront previous misconceptions with knowledge acquired when learning. Therefore, the response to the user's error may result in enduring understanding of pre-conceived notions as based on intuitive knowledge ("Albemarle County Public Schools"). Students tend to revert to former misconceptions. According to James Mbuva *teachers should consider the cognition, language, and the culture of each student* (Mbuva 2003: 11).

The quiz in MIT resources operated smoothly, but did not include any didactic comments. UST students often published quizzes, but their comments were sometimes disparaging and unpleasant for the user: *Actually, you aren't even lucky this time, because you were only trying to guess!* (Bystrowski). However, this quiz has an educational value – it was visited by more than 405 000 users.

In the case of CMU, the precise addressing of the course to basic education resulted in consistent teaching. The student was asked to enter his name, to review the theoretical part and to do the activities. Communication on the validation occurred immediately and was personalized. In the case of an error, the incorrect response was crossed out and instead there appeared a comment: *Sorry, ... is incorrect. The correct word is* ... The user was required to show accuracy. Omission of a full stop at the end of a sentence resulted in the answer being recognized as incorrect.

In other CMU courses, in the case of a mistake, the student was encouraged to return to an adequate theoretical part. None of the tasks had time limit, but it was impossible to improve the result. Moving on to another task was possible after the correct answer. However, in the case of three incorrect answers, the appropriate answer appeared.

The guide for foreign CMU students was an elephant, empathically reflecting the feelings of the candidate for the student. When the answer was correct, it was very glad and smiling, but to erroneous ones, it reacted with a fountain of big tears.

3.3. Cultural awareness

MIT employees and students of UST focused on the promotion of new technologies, while Thais seized the opportunities of promoting the culture of their country and region. In the course for pre-arrival students, 8 websites connected with Thai culture were indicated. The guide in this presentation was an elephant – the national symbol of Thailand. Until 1915 the image of a white elephant was even placed on the flag of Thailand. Candidates for students are expected to respect Buddha images. The promotion of dominant religion is noticeable in topics: *History of Buddhism, Buddhism and Daily Life, Hinduism, Ramajana,* one about Christianity and none connected with Judaism.

Illustrations expose local architecture, Thai flag, traditional Asian landscape with cows on rivers. One of them showing a flag and a wooden village school (purpose-built within the five-year plan, launched in 1961) is posted on 405 Thai educational sites and very popular.

Lessons were connected with local culture (*Conch Trumpet Lesson, Fundamental of Thai Language, Thai Music, Thai Sweets, Thai Traditions*) and local environment (*Volcano Birth, Tsunami, Birds Migrations, The Himalayas*). Thais promote their own and Asian culture as an export article, so a lecture about derivatives was illustrated by a ~~doll~~ Matrioszka doll.

Thais put on learning from scratch. Most of the presentations were targeted at pre-elementary and elementary education (172). Exercises have been developed in English, which contributes to its popularization, and they facilitate further study.

Some learning objects were elaborated under the auspices of UNESCO and in the USA (Fox Valley Technical College, Columbus Ohio's dynamic Center of Science and Industry – biology, University of Wisconsin, Regents of University of California – math, MIT – mechanics, microelectronics, computer graphics etc. – were posted, but unavailable). Applets developed by the Americans referred to Western scientists (Euclid, Pythagoras, Pierre de Fermat, Isaac Barrow, sir Isaac Newton, Gottfried Wilhelm Leibniz, Augustin L. Cauchy) and American geography – e.g. a video showing a police officer chasing a driver moving with excessive average speed from Santa Monica to Long Beach (USA). But an appropriate remix of media content is not a simple promotion of Western culture. It is meaningful adaptation to the needs of new Eastern users in the Age of Access.

3.4. Costs incurred by the user

CMU applets and UST courses are free and independent. But the implementation of MIT courses is always associated with buying textbooks in *Amazon*, and some classes require students to pay laboratory fee, to finance a trip, even a flight to China. Some courses are implemented on request of external institutions, therefore, can be realized only at MIT. On the other hand, CMU free applets may be used in every school (especially international and exclusive private) and during non-formal learning.

CONCLUSION: SERIOUS, NOT GLITZY LEARNING

Researchers are skeptical about online learning. According to Kostolányová, today *e-learning in its classic form is almost obsolete* (Kostolányová 2013: 133). Technology does not necessarily upgrade education, e-learning in many courses is passive (Umryk 2013: 101). But it is possible in distance learning to connect purposeful activity of users with developing key competences, different learning styles and promoting local culture.

It has proven that the least interactive courses were developed by MIT, most interactive by CMU. Therefore, we could repeat after Veenema and Gardner: *European and Asian countries routinely surpass the United States in educational accomplishments, not because their technology is more glitzy, but because the educational enterprise is taken more seriously* (Veenema, Gardner 1996: 75).

PROPOSALS: LEARNING AS A FORM OF FREEDOM

Institutional learning reinforces the inequalities, therefore, the rank of institutional science falls for non-formal, non-governmental, private schools and universities, citizen science (*Open Research*: 99) and cooperation in the framework of "Wikipedia" (Jemielniak 2013). Nobody is expert on everything. Therefore, open access to open science is worth the steady to improve, because increases the number of independent learners. Many people are studying part-time or remotely. Everybody should have the opportunity to learn from scratch and work independently, having access to the Internet and information, understanding economy, technology, their culture. It is the point of education and information society. Nobody wants to be human capital or economic resource. A human being functions not only as an employee, worker or clerk. Effective (interactive) and independent Long Life Learning is one of the deepest forms of freedom.

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ELECTRONIC ASSESSMENT TOOLS IN LEARNING MANAGEMENT SYSTEMS - PERCEPTIONS OF STUDENT TEACHERS OF FOREIGN LANGUAGES

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Abstract: *The paper deals with the concept of electronic language assessment delivered in the e-learning mode. After a brief outline of the history of Computer-Assisted Language Testing (CALT), the discussion of its tools and procedures, as well as strong and weak points follows. The second part of the paper reports upon a study into student teachers' perceptions of electronic assessment, with a special focus on such aspects as strengths and weaknesses, priorities for use and perceived obstacles.*

Keywords: language assessment, computer-based testing, Learning Management Systems, student teachers

INTRODUCTION

The use of computers in language learning and teaching has become well established nowadays. Out of a plethora of applications of modern technologies language testing and assessment have been studied and developed to the greatest extent. Computer-Assisted Language Testing, Computer-Managed Testing or Computer-Adaptive Testing are all concepts that are well established in the literature. However, there is always a need to put these theoretical constructs into practical use in teacher training and development, in order to make sure that teachers are actually aware of the

strengths and weaknesses of computerised testing and are willing to apply it in their own practice.

The purpose of the present paper is to gain insight into perceptions student teachers of foreign languages have towards computerised testing. After bringing up some general concepts of Computer-Assisted Language Testing, the paper will recount the results of a study conducted among student teachers. This particular group was selected for the research due to the fact that they are relatively inexperienced as teachers, are in the process of shaping their own teaching style, yet are well experienced in the use of computerised testing as learners. In particular, perceived strengths, weaknesses and obstacles to use will be addressed in the course of the study.

1. BACKGROUND

1.1. An outline of the history of Computer Assisted Language Testing

The history of Computer-Assisted Language Testing (CALT) dates back to the 1960s. It was in the early days that computers utilised in language education already served the purpose of assessment. The behaviourist methodology of the 1950s and 1960s and the capacity of the then-computer systems, e.g. *PLATO* (Beatty 2010; Godwin-Jones 2001; Warschauer 1996), to store test items, process responses and provide simple feedback (Alderson & Bachman 2007) promoted the use of computer technology in electronic gap filling/multiple-choice tests.

In the 1970s and 1980s grammar and vocabulary testing was facilitated by enriched computerised feedback and the recognition of partially correct responses due to the appearance of PC-dedicated programs e.g. *Calis* (Godwin-Jones 2001). Computers could also test forms of more sophisticated language performance, e.g. text reconstruction or paced reading (Warschauer 1996). However, a major development was marked by the advent of word-processing software, e.g. *WordPerfect* or *WordStar*, whose enhanced grammar/spell-checking functions transformed computers into a tool for test design and self-assessment.

At the turn of 1980s and 1990s the emergence of multimedia computers enabled educators to test integrated language skills within multimedia Computer-Assisted Language Learning (CALL) software bundles (Warschauer 1996) or stand-alone testing applications, created with the use of authoring software, e.g. *Toolbook* (Marczak 2013).

What revolutionised computer assessment, however, was the 1990s' wider-scale introduction of the Internet, which freed test takers from the constrictions of a specific operating system or particular software and hardware (Alderson & Bachman 2007). Since then the Internet has offered new means of testing, such as electronic forms, virtual learning platforms or online authoring services (Krajka 2012).

Word processors (*Microsoft Word* or *Libre Office Writer*) increased their capacity for language testing through the addition of a number of text review functionalities and more precise grammar/spell-checkers (Atkinson & Davies 2008), while speech recognition systems permitted the testing of oral responses (Alderson & Bachman 2007).

The twenty-first century has brought about further developments in CALT. Computerised tests will now automatically adapt their content in real time on the basis of the testee's responses (Chapelle & Douglas 2006), which is a capacity featured within virtual learning environments (VLEs), such as *Moodle* (Cole & Foster, 2007). What is more, the growing popularity of MOOs, i.e. Multi-user Object Oriented environments (MOOs) where learners interact with two-/three-dimensional objects in a virtual reality (Beatty 2010; Hauck & Young 2008) or social networking sites, have fostered the use of computer-mediated-communication (CMC) (Beatty, 2010; Lamy & Hampel 2007) for educational purposes, including the assessment of socio-pragmatic elements of language (Bretag 2006) and intercultural competence (Hsinyi et al. 2009).

1.2. CALT procedures and technologies

As Noijons (2001) posits, Computer-Assisted Language Testing is a process in the course of which "language performance is elicited and assessed with the help of a computer" (Noijons 2001: 38). In consequence, it may be stated that the two most significant aspects of CALT are test delivery and response evaluation.

Computerised test delivery. Test delivery in CALT embraces: (i) interaction between the test taker and the computer; (ii) test functionalities; (iii) user interface; (iv) types of test items; (v) time management; and (vi) response registration (Noijons 2001).

As far as interaction goes, testee-computer interaction may be limited to simple response selection on the part of the former and response scoring performed by the latter. Alternatively, a computerised test may involve elaborate forms of interaction, as it happens e.g. in computer-adaptive tests (CATs) (Chapelle & Douglas 2006), where test items are dynamically selected by the computer in real time in response to the testee's performance. The level of interaction may be affected by the nature of the test, the test authoring/delivery technology available and the costs incurred (Noijons 2001).

Test functionalities are the features which are, or are not, available to the test taker, such as instructions on test delivery, response clues, help options or forms of feedback, be it instant or delayed. Test functionalities have an impact of the usability and practicability of a test; they may also affect test validity, which may be particularly important in high-stakes contexts (Noijons 2001).

The graphic user interface of a computerised test may be enriched by a wide range of media, including text, images and audio-video cues. Depending on the technology

involved, operating the interface may require computer skills such as the ability to double-click, scroll pages of content or drag-and-drop test items. Moreover, the quality of the interface may depend not only on its components but also on the manner in which the content is arranged, i.e. the layout, which has a direct effect on the user's perception of test clarity (Noijons 2001).

The two major response categories into which test items fall are select and constructed responses. While the latter require the testee to make a choice out of a number of preset response options, the latter call for writing in one's own original response. In effect, as in pen-and-paper tests, select responses are easy to score, whereas constructed responses inevitably involve response interpretation. Thus, multiple-choice or true/false test items are computer-scored, while written-in responses may need to be analysed by a human tester. What seems to be the optimal solution is a combination of both select and constructed responses (Noijons 2001).

Time management refers to the restrictions of the test-taking time which are imposed on the testee. The time limit in a test may influence the test-taking procedure as well as the ensuing stress. Overall, it is vital to provide the testee with a sufficient amount of time in which he/she would be able to read the test rubrics, take advantage of the features of the user's interface and complete the test per se. However, due to varying levels of test takers' literacy, setting an adequate time limit may prove to be a challenge (Noijons 2001).

The last stage of test delivery is the registration of learner responses. Interestingly enough, the value of the data gathered from the test responses stems not only from the fact that it permits assessment, as the responses may also help one diagnose test-taking strategies or even the process of language acquisition (Chapelle 2001).

Response evaluation in CALT. Response evaluation in CALT can be considered with regard to the following aspects: purpose and scope, timing, response processing, type and purpose of feedback, as well as the time in the course of the testing procedure at which feedback is provided (Almond et al. 2002). Response evaluation boils to the computation of the final test score, which may, however, be influenced by a number of criteria, such as the number of questions answered, the duration of the test attempt or the test taker’s route through the questions.

Depending on its purpose, response evaluation will either be limited to the generation of a numerical score, reflective of the testee's performance, or the collection of a range of data whereby the testee's profile may be established. Constructed response tests will require deeper-level analysis, where responses are scored partially rather than on a simple correct/incorrect basis.

As regards the time at which the data is processed, in most tests data processing occurs after the test, but in computer-adaptive tests the testee's responses must be processed in real time because they determine the range and order of the questions that follow (Douglas & Chapelle 2006).

Computer-generated feedback may constitute guidelines which will facilitate learning. If that is the case, feedback will need to focus on the test taker's performance within particular test tasks. Yet, if the purpose of testing is the establishment of the testee's level of language competence with regard to a selected skill, summary feedback will be more appropriate, as it will cover a range of criteria relating to language performance (Almond et al. 2002).

Response evaluation is conducted automatically, however, the time at which the score is displayed to the testee may be delayed. In order to ensure test validity the score is conventionally provided on test completion. However, if a computer-based test plays the role of assessment, and its primary goal is the provision of facilitative feedback, responses need to be scored in real time, so that performance can be corrected and the learner's attention is drawn to problematic language forms.

2. THE STUDY INTO STUDENT TEACHERS' PERCEPTIONS OF ELECTRONIC ASSESSMENT IN LEARNING MANAGEMENT SYSTEMS

2.1. The aim of the study, research questions and data collection procedure

The aim of the study was to examine the student teachers' attitudes towards computer-aided assessment. The major research questions posed in the study were the following:

1. With experience as participants of e-learning courses, how do student teachers view e-learning assessment (as effective or non-effective)?
2. Are they going to use e-learning assessment in their practices and, if yes, to assess what areas of learners' performance?
3. Which components of e-learning assessment are considered as its strengths and which as its weaknesses?
4. Which types of questions/test items (selected response questions or constructed response questions) lend themselves better to technology-aided testing?
5. What areas of the learning process (data collection, learning strategies, problem solving strategies used, progress or achievement) are most often tested by e-learning assessment?

An online survey study was conducted on 38 student teachers, who fell in to two groups: (i) those who had been directly involved in e-learning authoring; and (ii) the passive recipients of e-learning assessment, who had participated in a variety of e-learning courses. The participants were selected on a random placement basis.

The questionnaire which the respondents filled in contained 9 questions in total, 4 open-ended questions and 5 close-ended questions. Two multiple-choice questions offered the respondents an opportunity to write in their own unpredicted responses. When asked to assess strengths and weaknesses of electronic assessment, participants were prompted to make their choice out of the following options, in order to make sure their responses are channelled towards appropriately shaped constructs:

- the use of multimedia;
- the use of Internet resources (in the case of Web-based tests);
- the need to use computer skills (launching test functionalities or applications with a double-click, using a scrollbar to display content, using the drag-and-drop technique to operate applications);
- test completion deadlines;
- computer-controlled time limits in tests;
- test compatibility with web browsers;
- test compatibility with the software installed on the end user's computer;
- data security (e.g. confidentiality of test items and tasks);
- web accessibility;
- the quality of the multimedia involved;
- the clarity of the interface;
- the possibility of verifying the test taker's identity;
- the very use of new technology.

2.2. Results and findings

75% of the respondents stated that e-learning assessment is effective, while 21% expressed the view that it is not effective, or its effectiveness is limited, with one missing response (4%). The former group supported their stance with the following arguments, with the most frequently selected responses being that computerised testing

- provides immediate feedback (36%);
- facilitates the teacher's job (24%);
- motivates learners (16%);
- gives learners an opportunity to perform tasks at their own tempo, at the most convenient time and in the setting of their choice (12%);
- reduces the time necessary to administer assessment (9%);

- develops ICT and online skills (8%);
- involves multimedia and online resources (8%).

Single respondents put forward increasing learner autonomy, enabling the teacher to control the learners' actions, setting a deadline by which tasks need to be completed, easy identification of the testee, forcing the learner to rely on their own knowledge and skills if tasks are performed under the pressure of a time limit. The overall percentage score exceeds 100% due to the fact that particular arguments were occasionally cited by a number of respondents.

Those who perceived the effectiveness of e-learning assessment as limited or who believed that computerised assessment was ineffective maintained that its quality may be negatively affected by lack of feedback and multimedia resources require the use of selective reading skills, which are difficult to develop. They also stated that the effectiveness of computerised tests may depend on the kinds of tasks that it involves and it cannot replace traditional assessment as long as artificial intelligence does not equate to the intelligence of a well prepared teacher. Some other shortcomings enumerated by a significant number of respondents were a limited number of assessment tools which yield partial scores; inadequate provision of equipment necessary for ICT-aided assessment, and technical problems leading to test failure.

In question 2 a relatively large proportion of the respondents considered the following components of e-learning assessment as its strengths:

- the use of multimedia (79%);
- the very use of new technology (76%);
- the use of Internet resources (63%);
- data security, e.g. confidentiality of test items and test tasks (68%).

Around a half of the respondents believed that the strengths of computerised assessment derived from the degree to which computer-aided tests are compatible with Web browsers, the testee's access to the Web. For one third, time limitations, i.e. the fact that e-learning tests must be completed by a set deadline, the time limit imposed and observed by the computer during the testing session and the quality of the multimedia included in a test were important assets of computerised assessment.

A noticeably lower percentage of the respondents expressed the view that the strengths of e-learning assessment lied in

- the extent to which the test taker's identity could be controlled (29%);
- the clarity of the interface (26%);
- the compatibility of computerised tests with the software installed on the end user's computer (21%);

- the necessity for possessing computer skills (8%).

Only one respondent added through the write-in option that computerised assessment may involve creative tasks and stated that Web accessibility today encourages learners to take e-learning tests.

In question 3, a great majority (76%) of the respondents believed that the weaknesses of computerised assessment derived from the necessity of computer skills. For around a half of the interviewed student teachers the fact that computerised tests must be completed by a set deadline, the degree to which tests are compatible with the software installed on the end user's computer, the clarity of the interface and computerised time limits in a test were the features that demanded careful attention of the test designer. Smaller proportions of the respondents perceived the weaknesses of e-learning assessment in

- Web accessibility (26%);
- the compatibility of computer-aided tests with Web browsers (24%);
- the quality of the multimedia included in tests (21%);
- the use of Internet resources within Web-based tests (18%);
- data security, i.e. the confidentiality of test items and test tasks (13%);
- the very use of new technology (8%) and the use of multimedia (5%).

Such aspects as limited access to the Web, limited test duration, need for a permanent Web connection, occasional lack of accuracy were all perceived as problems of computerised tests by a very tiny proportion of the respondents. A summary of data on perceived strengths and weaknesses of computer-managed assessment can be found in Figure 1 below.

In question 4, an overwhelming majority of the respondents (92%) indicated that selected response questions, i.e. multiple choice questions, true/false questions, lend themselves better to technology-aided testing than constructed response questions.

Question 5 examined in greater depth the respondents' views of selected response and constructed response tasks in computerised assessment. The reasons cited against the idea of utilising e-learning assessment for constructed response tasks were lack of relevant and reliable technology; the amount of time necessary for evaluation; the amount of effort that the teacher needs to invest in evaluation; lack of the transparency of evaluation criteria; the potentially discouraging effect of open-ended tasks on learners and health issues caused by the testees' long-time sessions in front of the computer screen. However, all of these were answered by a relatively small number of respondents, below 10% each, which, obviously, calls into question the significance of the responses. At the same time, similarly few respondents observed that constructed response tasks are the only option for assessing writing skills; require more learner engagement; make learners search for answers online and involve individualised feedback.

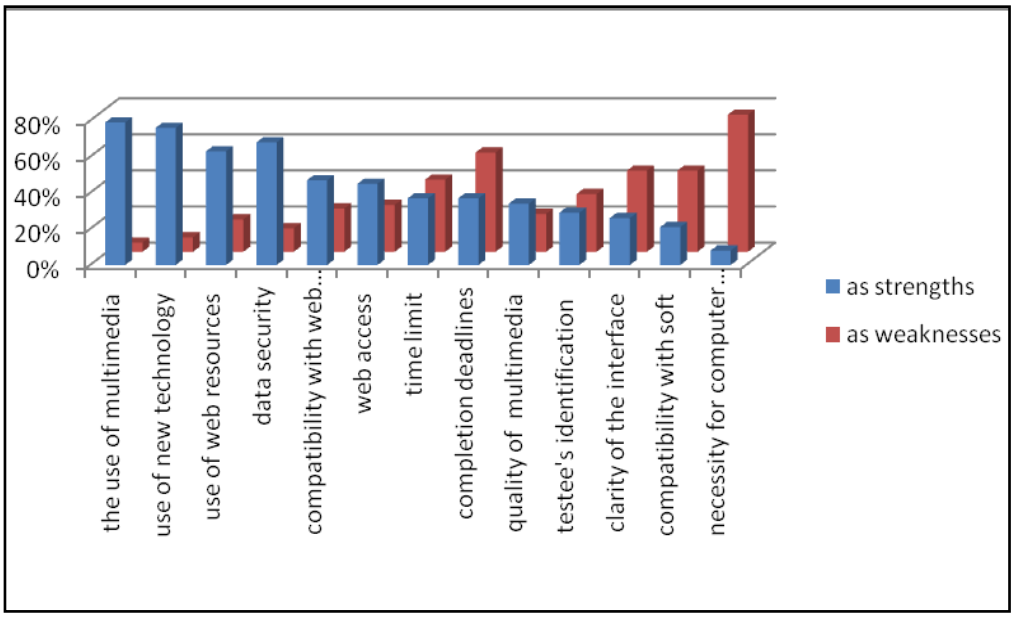

Figure 1. Features of e-learning assessment as strengths/weaknesses

Source: authors' own idea

The respondents expressed the general view that the advantages of the computerised assessment of selected response tasks lied, mainly, in the little amount of time necessary for evaluation and the straight-forwardness of test implementation and assessment (around a half of the responses). Such aspects as the immediacy of feedback provision and the objectivity of evaluation were pointed by only around 10% of the student teachers questioned. Strangely enough, one respondent stated that close-ended tasks stimulate more logical thinking than open-ended responses, which can be copied from online resources.

Interestingly enough, almost three-quarters of the respondents stated that in e-learning assessment the focus is on the learning process, including data collection, learning strategies and problem solving strategies used by the testees. On the other hand, 29% claimed that e-learning assessment concerns mostly the effects of learning, e.g. progress or achievement.

Almost all of the student teachers surveyed maintained that they would use e-learning assessment in their future practices, while only 8% stated that they would not do so. Those who declared they would utilise e-learning assessment supported their stance with the arguments that it motivates learners and is a quick and effective assessment mode (both around 40%). Other perceived benefits, such as giving a break from the classroom routine, making learning an enjoyable experience or offering more convenience to learners, were selected by only around 10%.

Those who declared that they would not use e-learning assessment stated that it is difficult due to limited access to the computer or lack of equipment and it can be used only in extracurricular lessons. However, all of the three reasons were mentioned by very few student teachers.

When listing the purposes for which they would utilise e-learning assessment, the largest proportion of the student teachers stated that they would assess vocabulary (88%), grammar (65%), listening comprehension skills (48%) and reading comprehension skills (58%). 24% of the respondents claimed they would test writing skills, or maintained they would assess listening and writing skills through dictation tasks, and only 7% of the respondents wrote that they would assess Web searching skills. The remaining options were chosen by a single respondent each.

2.3. Discussion

All in all, a vast majority of the students surveyed considered e-learning assessment effective. Most of the respondents agreed that the strengths of computerised assessment lied in the incorporation of multimedia, new technology at large and Web resources; data security, compatibility with the end user's software and time limitations, while the perceived weaknesses were the necessity for computer skills, compatibility issues, limited clarity of the interface, as well as the imposition of time limitations. What draws attention is the fact that relatively large proportions of the respondents considered time limitations in computerised assessment as both a strength and a weakness, with 37% and 40%, respectively. It may be inferred that the imposition of task completion deadlines and time limitations may be perceived as an advantage or a disadvantage, depending on the circumstances or the perspective, e.g. the test author's view vs. that of the learner.

A large majority of the respondents stated that e-learning assessment is best suited for selected response tasks rather than constructed response ones. It transpires from the results obtained that the belief is based on the technical limitations of e-learning assessment tools. The respondents, who indicated the benefits of open-ended assessment tasks, would be ready to implement it, should ICT offer better affordances. At the same time, it is worth underlining that by expressing such views about the applicability of e-learning assessment to selected vs. constructed response tasks, the respondents seem to have equalled e-learning assessment to a procedure which would be fully performed by an automated system. That, in turn, calls for raising student teachers' awareness that while e-learning assessment is to facilitate human assessment, it does not necessarily aim to eliminate it.

The remainder of the findings indicate that the largest proportions of the respondents would implement the e-learning testing mode in order to assess receptive skills, vocabulary and grammar. They would, therefore, focus on summative assessment. It is noticeable that they do not so much consider the less obvious options, e.g. assessing the productive skills or Intercultural Communicative Competence at large.

Finally, a vast majority of the student teachers maintained that they would use e-learning assessment in their future jobs, which implies that even passive experience to modern assessment modes and instruments may translate into actual classroom practice. However, 12% of the respondents could not quite explain why they would use e-learning assessment; they only stated that in the 21st century new technologies should be utilised for the purpose of learning/assessment, which is not a convincing argument. Consequently, it seems reasonable to conclude that teacher education courses need to explicitly raise awareness of the rationale for the use of e-learning assessment as well as exemplify the actual affordances that it creates.

3. CONCLUSION

Assessment of learners is a highly important area in foreign language methodology, with a whole myriad of approaches and tools to choose from. Depending on the needs of learners, the logistics of the teaching programme and the teaching philosophy of the instructor, either traditional or alternative assessment can be applied, with their specific evaluation guidelines and instruments. Tests or portfolios, diaries or self-assessment grids, can all be implemented in various modes of the course to assess both language proficiency and Intercultural Communicative Competence.

Given a wide variety of activities and resources in contemporary Learning Management Systems such as *Moodle*, various assessment scenarios can be designed both in reference to language proficiency as well as knowledge, skills and attitudes of ICC. It is to be hoped that the future will bring more empirical studies into how assessment of ICC in e-learning influences learners' awareness of various components of the competence.

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TRANSLATING IN THE CLOUD - NEW DIGITAL SKILLS AND THE OPEN-SOURCE MOVEMENT

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Abstract: *The 21st century will, in the future, be regarded as the era when the Internet became a dominant feature of our everyday lives. Using the Internet, both academic users, and the general public have developed encyclopedias, crtical editions, dictionaries and analytical applications charting areas in which digital humanities (DH) cross disciplinary boundaries. The computing environment enables scholars/scientists to interact with the computer, leading them into unexplored avenues. The plethora of applications for research and teaching within subjects deliver scholarly materials supplied by sophisticated World Wide Web tools. As a result, a new digital user or digital citizen is expected to be equipped with digital skills as well as digital literacy. Those users` access to computer laboratories makes the teaching and studying offer more attractive. What is more, globalisation, on the one hand, and transfering data and programmes from desktop PCs to open-source platforms affect the quality of preparing translation classes for trainee translators at universities. This shift from locally installed programmes to distant data servers reached through the Internet, has affected translators` collaboration transfering their operations into the cloud.*

The author of this article will discuss a range of advantages offered to end users, translators and teachers in terms of cloud computing (CC), which should be incorporated in academic programmes. Thus, it is said that a new set of market-oriented competencies are expected to be acquired by a trainee translator at university level. This is why, university programmes offering in-depth training in translation must be changed and adapted accordingly.

Keywords: cloud computing, digital skills, digital literacy, translator`s competencies, CAT tools

INTRODUCTION

Today, it is increasingly easy to notice there are many academic institutions focusing on new research methods and new pedagogical activities, involving concrete programs, curricula, students, scholars and technologists. The demand for translation technology comes from: individual translators, translation agencies, publishers and content producers for the focus of these groups is process automation. There is an increasing trend towards machine translation. It should be emphasised that vendors providing language service are using machine translation more frequently as there is a need to serve clients who translate larage amounts of material translated cheaply and quickly. Choudhury and McConnell (2013: 42) point out that "a document might be translated by machine but it is sent to human translators (users, professional translators or both)" who provide feedback, suggest translations, or editors for detailed review and post-editing. Even if several levels of translation are offered, there will be a standard hybrid translation service. After using free machine translation and obtaning a draft machine translation, customers need to cooperate with professional translation service. But the important point, though, is that after being machine translated, the document is later cleaned up by people as it is impossible to "program a machine to understand the semantic intentionality of a text." (Choudhury and McConnell 2013:46). This is why, a good human translator needs to be capable of encompassing computational linguistics and a knowledge of how to solve problems while post-editing translated digital content since computers are not programmed to replace human translators. In the light of translation technology, data challenge requires team collaboration so translation tools can reinforce and facilitate "the productivity and consistency of human translators" (Choudhury and McConnell 2013:15). Moreover, there is a new direction as the translation sector transfer the translation process from on-premise computer-assisted/aided (CAT) tools to server and then **cloud-based** services.

This paper proposes to discuss a number of issues, such as: How does university trainee-translator training differ from traditional teaching - learning process which, generally, has been based on traditional desktop CAT tools? How will the introduction of cloud-based CAT tools influence the translation process and the professionalisation of translation? With a view of answering these questions, we shall discuss implementing DH issues into curriculum as well as the idea of 'scaffolding' traditional humanities work by incorporating cloud-based digital tools.

1. DIGITAL HUMANITIES

According to Kischenbaum (2014), "[t]he digital humanities, also known as **humanities computing**, is a field of study, research, teaching, and invention concerned with the intersection of computing and the disciplines of the humanities. It is methodological by nature and interdisciplinary in scope. It involves investigation, analysis, synthesis and presentation of information in electronic form.

It studies how these media affect the disciplines in which they are used, and what these disciplines have to contribute to our knowledge of computing."

In the spirit of our discussion, DH is an active field rejuvenating and encouraging traditional humanities curricula with digital tutorials, tools, and other resources. As quality is one of the prime requirements for translation, DH strategies need to be regarded as priviledged in the light of incorporating digitized materials and traditional lingistics, art and cultural studies, as well as social sciences with Internet applications, information retrieval devices, data mining, etc., which augments, enhances and speeds up translation process. Thus, new emerging technological trends will change the design of translator training environment, which is discussed in the subsequent sections.

1.1 Digitization in education sector

There is a spectrum of organisations[1] that are perceived as umbrella organisations promoting and supporting digital teaching across humanities disciplines. In the field of DH, Hirsh (2012: 17) says that "the common theme of digital humanities pedagogy" focuses on techniques of "bringing the technological and the human togehter." Hirsh pays attention to the fact that "the overwhelming majority of students (...) have a basic level of technological proficiency". However, "even if the technical knowhow of the student body was already high, (...) the importance of constant peer-to-peer and peer-to-mentor communication and consultation" was emphasised. Tapscott (2008) shows that the 'net generation' is encouraging the educational system to adapt to technology. In the light of teaching students in the DH, Sinlcair et al. (2013: 17) note that the word 'cloud' tool for "use in philological research, a technique," has been bypassed. In this perspective, Hirsch (2012) suggests that a student`s first interaction with the digital humanities may be reached by word 'clouds'. These have enormous practical value for trainee translators who grew up around computers, should be more adept at basic computer technology.

[1] The most important organisations promoting and supporting DH acting as a community-based consultative and advisory force are the Alliance of Digital Huanities Organizations(ADHO), the European Association for Digital Humanities (EADH), the Association for Literary and Linguistic Computing (ACH), the Consortium for Computers in the Humanities (centerNet), the Australasian Association for Digital Humanities (aaDH), and the Japanese Association for Digital Humanities (JADH). Their purpose is to promote the developement and use of computational methods in research and teaching as well as advancement of education in the DH.

1.2 Digital Competence

Demand for translation is growing as producers expand their reach in multiple languages[2]. As most people use laptops, tablets and mobile devices, the translation industry has been developed more opportunities for companies selling their products via web services. In order to support e-commerce successfully, creating and sharing knowledge as well as collaborating with a spectrum of potential users it is necessary to updated academic curriculum for digital literacy[3]. Specifically, translation agencies are more interested in employing applicants with a new range of skills, which is depicted in application forms that include a spectrum of important information such as pairs of languages, linguistic degrees obtained, services provided, translation expertise, etc.

1.2.1 21st Century Skills - labour market environment orientation

All things considered, the world has changed decisively, quickly and permanently in terms of employees` skills important for employers. Technological advancement has made societal shifts essential in the Information Age. Marquis (2013) points out that the University of Melbourne proposes a set of essential competences that should be considered in the Information Age. The competences proposed:

a. ways of thinking (i.e. creativity, critical thinking, problem-solving, decision-making and learning)

b. ways of working (i.e. communication and collaboration)

c. tools for working (i.e. information and communications technology (ICT) and **information literacy**)

d. skills for living in the world (i.e. citizenship, life and career, and personal and social responsibility)

The above-mentioned competences make traditional universities, colleges and higher education focus on developing new methods of teaching and training to keep up with their students and educators (Spangler 2012). It is worth noticing that higher education witnesses students and educators who use a plethora of familiar

[2] According to TTL Report (2013) in the 1980s it was enough to translate content from one source languag (SL) to 10 target languages (TL); then, in the 1990s more digitized documents were translated; approximately from one SL to 25 TL texts; after 2000 the number of TL texts grew up to 40 languages and since 2010 there was a growth both SL texts; there were as many as 6 SL languages that were expected to be translated into about 60 TL texts. It is estmated that between 2010 and 2020 it will be possible to equlize the number of SL and TL texts to 150 languages. (TAUS 2013: 50)

[3] In all these concepts of DH, digital literacy (DL) builds upon the foundation of traditional forms of literacy. It is a combination of digital information, digital competeneces, digital citizens, etc. In this perspective, DL is required for almost any job in which utilising IT is treated as high priority in the labour market requirments.

technologies such as tablet computers, interactive whiteboards, digital projectors, e-learning, open platforms, etc, which is linked to new trends such as "Digitized Classrooms" and the "Opening of Information" (Marquis 2012).

All things considered, higher education needs to be adaptable as well as able to incorportate the latest technologies in the curricula. This factor does emphasize students` skills and abilities as well as their needs to successfully enter the workplace. With a view to the most comprehensive translator competency, Koroseč (2014: para. 13-14) proposes Kelly`s (2005) classification that is limited to the six translator competencies that contribute to improved translator training techniques:

a. language comptence - refers to communicative and textual competence in pairs of languages (SL/TL), taking into account student`s level of language competence both SL and TL;

b. cultural (and intercultural) competence - refers to translator`s acquired competence in perception, myths, beliefs, values, stereotypes shared by the members of their working culture;

c. professional and intrumental competence - refers to terminological research, information magagement, and the use of IT tools;

d. interpersonal comptence and networking - refers to translator`s ability to work in teams;

e. subject area competence - refers to translator`s comprehension connected with looking for information;

f. attitudinal competence - refers to a professional translator`s self-confidence and socialisation;

Having compared a spectrum of translator competencies, it should be emphasised that education sector is continuously updating its curriculum for digital literacy so as to be in line with accelerating technolgical developments. Thus, in terms of didactic strategies, teacher trainers, educators and scholars are expected to bridge communications technology innovations and digital classrooms by creating a learning environment acting as a globally and digitally oriented guide, assistant, mentor and facilitator.

1.2.2 EMT promoting interdisciplinarity

There is increasing demand for multilingual language services requiring quality translation. The European Master`s in Translation (EMT) launched an Annual Report (AR) 2013 in which a group of experts promoted continuing training in language departments and cooperation with the industry. The Working Group (WG) idetified a set of challenges such as organising teacher training workshops, maintaining interactive map of translation programs, employability and comptences.

These proposals a teaching necessity in order to master future trends (WG 2013: 7). In the AR, the WG stressed the growing importance of technological competence which is particularly significant for graduates who are expected to be successful on the market. Thus, to open language student horizons, interdisciplinarity is the key priority (WG 2013: 18).

2. DIGITAL TRANSLATION ENVIRONMENT VS NEW TRENDS IN HIGHER EDUCATION

The availability of computers and the Internet cemented the role of technology in education, particularly in translation courses. There are now more computer laboratories and an Internet connetion in schools/education sectors. Weiss (2014: 2) underlines that it is of high importance to "orchestrate pedagogy and technology" effectively as they can "impact student learning."

This section will include insights on key trends in the segment of translation technology. In the 20th century, translation automation technologies were adopted by the professional industry to support translation service providers. According to Choudhury and McConnell (2013: 8 TAUS report) the coming years herald a new era. Information technologies (IT) "will be combined with machine translation to create new solutions." Step by step translation sector has been evolving from a phase focusing on the translation of paper documents in a traditional manner, to a phase of combining a spectrum of applications and software. In the 20th century most translation tools were sold as licensed software. More rcently, however, cloud based offerings have become more common, thus changing the translation industry.

2.2 Translation tools - new trends

CAT tools have evolved along with the computing industries. In the 1980s, these were stand-alone tools used on a single computer. Then, they were used on a company network and after 1995 they became web based tools delivered via the Internet. (Choudhury and McConnell (2013: 16).

But, in the light of globalisation and the needs of translation market, potential translators (freelancer registration) are asked to choose tools that they use not only as on-premises tools in translation process, e.g. SDL Trados, Wordfast, memoQ, Deja Vu, OmegaT, Across, Passolo, Multicorpora, Alchemy Catalyst, Transit, Lingo Trek, J-CAT, IBM-CAT tool, etc., but translators are required to share their translation memory resources in real-time and collaborate via cloud services.

2.3 Cloud computing

After a discussion of various issues underlying the need to treat Internet applications in a more broad manner, it is important to define the notion of cloud computing (CC). CC is still an emergent idea, and the range of definitions reflects this. Cearley

(2010: 2) and Gartner (2014) define cloud as "a style of computing where scalable and elastic IT-related capabilities are provided as a service to external customers using Internet technologies." Then, cloud computing is subdivided into four deployment models (Gartner 2010, 2014[4]; NIST[5] 2010):

a. public cloud computing - means that a third-party provider deliver services to external customers; it is a style of computing where scalable and elastic IT-enabled capabilities are provided as a service to external customers using Internet technologies;

b. private cloud computing - means the IT provides services to internal customers; it is a form of cloud computing that is used by only one organisation, or that ensures that an organisation is completely isolated from others;

c. community cloud - means exclusive use by a spceific community of consumers from organisations that have shared concerns (e.g. mission, policy, etc.);

d. hybrid cloud - means a composition of two or more distinct cloud infrastructures (private, community, or public) that are bound together by technology that enables data and application portability;

Moreover, UNESCO (2010) underline that cloud computing is among services that are increasingly provided to staff and students as they they are accessed from web browsers. According to UNESCO (2010) cloud computing should be defined by taking into account several key characteristics:

a. remote data centres - cloud services are delivered via the Internet from data centres located far from the end user and their institution;

b. pooling of resources - resources such as data storage, processing, memory and bandwidth are shared between multiple customers and can be allocated dynamically depending on demand ;

c. "infinite" scalability - a key feature is rapid elasticity of cloud computing; there is no need to purchase additional hardware;

d. pay per use - customers pay for the services they use while providers bear the costs of hardware and software provision;

[4] The quoted definitions are published by Gartner.com at http://www.gartner.com/it-glossary/public-cloud-computing and http://www.gartner.com/it-glossary/private-cloud-computing

[5] NIST is responsible for developing standards and guidelines for providing adequate information security. The NIST definition is intended to show broad comparisons of cloud services and deployment strategies.

e. self service - customers can decide what resources they wish to use without discussion with the provider;

In short, CC can be defined as a shared software platform that is purchased by the user as service, not as a product, is a modern trend. In the field of CAT instruments, this means that an agency does not have to purchase a license for CAT software; it only needs to pay for user access to the service provider's servers.

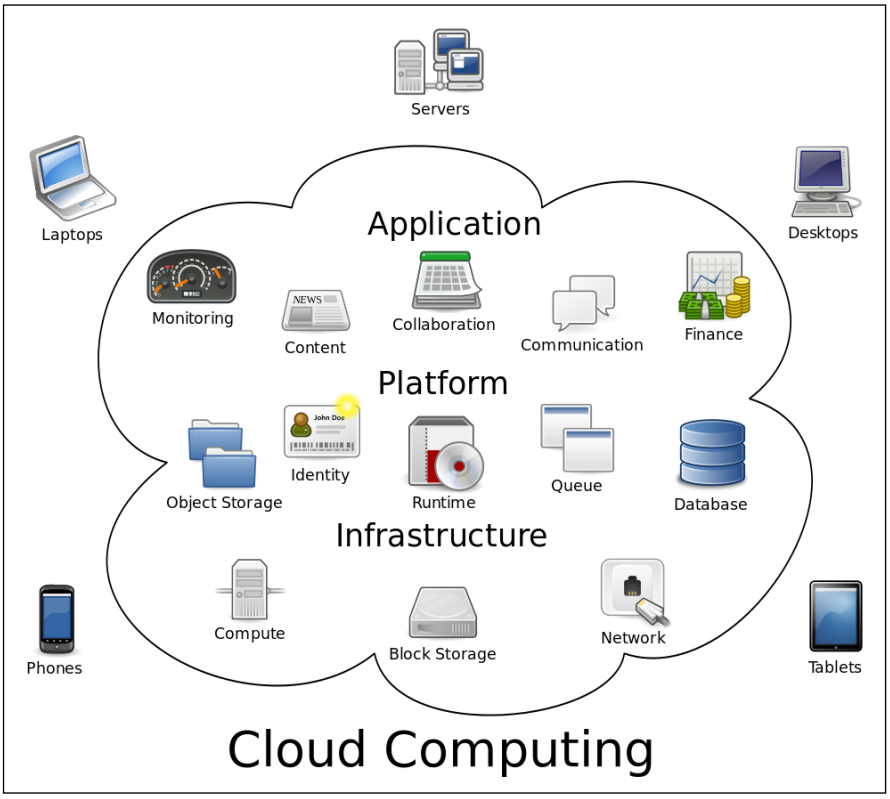

Figure 1. Diagram showing overview of cloud computing,with typical types of applications supported by that computing model (Johnston 2009)

Source:
http://commons.wikimedia.org/wiki/File:Cloud_computing.svg
This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license

In order to sum up the above discussion, see Figure 1 which shows the main ideas of cloud computing. Johnston (2009) presents the CC metaphor, which means that "the network elements representing the provider-rendered services are invisible, as if obscured by a cloud", this is why they are included in the cloud-shaped pattern.

The National Institute of Standards and Technology (NIST) defines a cloud infrustructure as "a collection of hardware and software (...) that can be viewed as

containing both a physical layer and an abstraction layer." (NIST 2010: 1) The former consists of the hardware resources which includes server, storage and network components. The latter consists of the software deployed across the former layer.

2.3.1 Service models of cloud computing

According to the NIST (2010), there are also five essential characteristics and three service models. As with service models, Mell and Grance (2011: 2-3) enumerate them as follows :

a. Software as a Service (SaaS) - it refers to the capability provided to the consumer to use the provider`s applications running on a cloud infrastructure; the applications are accessible from various client devices through either a thin client interface, e.g. a web browser, or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage; e.g. IBM Cloud, Lionbridge Translation Workspace;

b. Platform as a Service (PaaS) - this refers to the capability provided to the consumer to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage; but, the consumer has control over the deployed applications and possibly configuration settings for the application-hosting environment; e.g. IBM Cloud, Lingotek, Global Sight, OmegeT;

c. Infrastructure as a Service (IaaS) - this refers to the capability provided to the consumer as provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software; the consumer does not manage or control the underlying cloud infrastructure but the consumer has control over the deployed applications; (2011: 2-3); e.g. IBM Cloud

Moreover, Mell and Grance (2011: 2) point out five essential characteristics, such as:

a. On-demand self-service - a consumer can provision computing capabilities (e.g. server time and network storage) without requiring human interaction with each service provider;

b. Broad network access - capabilities are available over the network and accessed through standard mechanisms; they promote use by mobile phones, tablets, laptops, and workstations;

c. Resource pooling - the provider`s computing resources are pooled to serve multiple consumers using a multi-tenant model; there is a snese of location independence as the customer has no control or knowledge over the exact location of the provided resources;

d. Rapid elasticity - refers to capabilities that can be elastically provisioned and released; the capabilities appear to be unlimited at any time;

e. Measured service - cloud systems automatically control resource use by leveraging a metering capability; typically this is done on a pay-per-use or charge-per-use basis; (2011: 2).

2.3.2 Benefits and risks of cloud computing

There are some advantages and disadvantages in the field of CC since it is provided as a service using Internet technologies to multiple external customers. According to Gartner (2014) there are several pros and cons of the public cloud. There are positive aspects, such as agility, flexibility, user self-service, cost (perceived and real), opex vs. capex[6], standardisation, simplified sourcing, enable new solutions; in terms of negatives, they are data location, process isolation, portability, trust, licensing issues, financial models, SLA guarantees, bandwidth and latency.

3. CAT TOOLS IN HIGHER EDUCATION

3.1 On-premises CAT Tools vs Web Based Tools

In the 21st century, translation companies are reconsidering web oriented systems as there are new solutions such as cloud based products. Since 2000 there has been a trend to migrate towards web-based environment. Cearley (2010: 2) points out that enterprises are still accustomed to work on on-premises models[7], but "most will move toward private CC models." Generally, CAT tools offer a complete feature set of component technologies (i.e. translation memory, glossaries, document editing, spellchecking tools). There is a range of web-based CAT tools; yet, because of the limited scope of this article, it is not possible to discuss all web-based CAT tools, so only a selected set of those tools will be discussed.

In the light of cloud translation system, web based tools (WBT) are a new class of translation tools whose features increase translator productivity, efficiency, reduce cost as well as the number of errors. So far, however, little attention has been

[6] In terms of moving to cloud, organisations move away from a traditional capex to the opex; capex model means "buy the dedicated hardware and depreciate it over a period of time" and opex model means "use a share cloud infrastructure and pay as one uses it" (http://en.wikipedia. org/wiki/Cloud_computing)

[7] Zydroń (2014: 20) says that "over 80% of the global translation market is run by small to medium-sized enterprises (SME) organisation" that by and large "rely on desk-top CAT tools".

devoted to tools that are offered free and may be implemented in digital classrooms[8]. One of the powerful and popular WBT is the Google Translator Toolkit (GTT), which is offered for translators. GTT enables translators to pre-translate and post-edit texts using machine translation (MT). What is more, there is also possible to translate different formats such as Word, Excel, Power Point, etc. (for more examples see Figure 2).

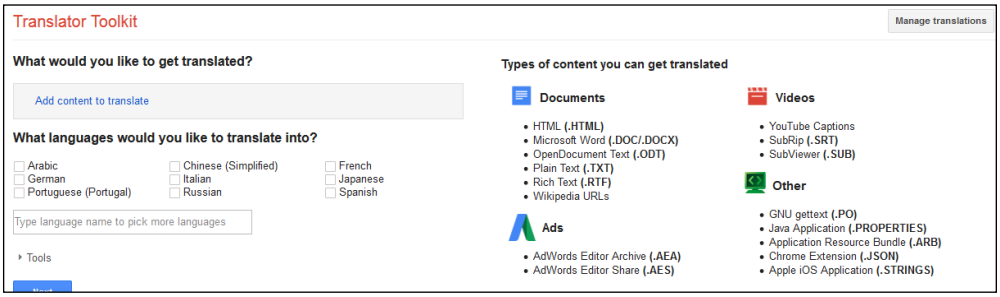

Figure 2. Google Translator Toolkit (GTT) - types of content that can be translated

Source: Own work

There are other web-based CAT tools which are integrated with MT, e.g. XTM Cloud, MemSource, Lingotek, Wordfast Anywhere, Wordbee, etc. Some of them are offered free of charge but the number of (texts/words) to be translated is limited. However, translating massive volumes of content requires the collaboration of translators, reviewers, TM experts, project managers, and so on to maximise the translation effectiveness (Roland 2014: 21). This new approach is discussed in the subsequent sections 3.2. and 3.2.1.

3.2 Team work - collaborative translation

Over the past 60 years, education sector is a collaborative interdisciplinary research environment. The computerised environment/sector, particularly in translation industry, illustrates how new technologies might be implemented in the curriculum. In the light of training trainee translators, it would be a good idea to quote Wheeler and John (2008) who point out that in digital classrooms there are many possiblities and digital capabilities for students whose learning comes from doing, making and problem solving. Thus, if trainee translators are supported with digital tools, their education is much more effective and fruitful. Their digital education material can

[8] According to UNESCO (2010: 10), "the intertia of educational institutions means that they are likely to be slower than business to migrate key services to the cloud." The growing tendency, among students, to deploy the Internet through mobile devices, makes universities deploy "rapidly evolving web-based applications and store their data online." (2010: 10)

be upgraded, edited, revised, selected, corrected or discussed with a range of experts in the 'community translation' (Roland 2014: 21). For example, XTM Cloud and GTT are well-architected CC tools for multiple translators working on the same file at the same time (see Section 3.2.1.).

3.2.1 Collaborative translation techniques

XTM Cloud uses the web to make collaboration easy. This tool supports dynamic translation production team. During project creation, the large files are split up by project managers and assigned to translators to the workflow. Each translator is automatically notifeid of their new tasks via email. Moreover, it should be emphasized that during translation process all the translators work online together. Before translating, several steps need to be performed, such as entering Customer`s details, importing TM, importing existing Terminology, and creating User accounts. If the translation project is based on collaboration with other users, the project manager is obliged to create accounts for them (see Figure 3).

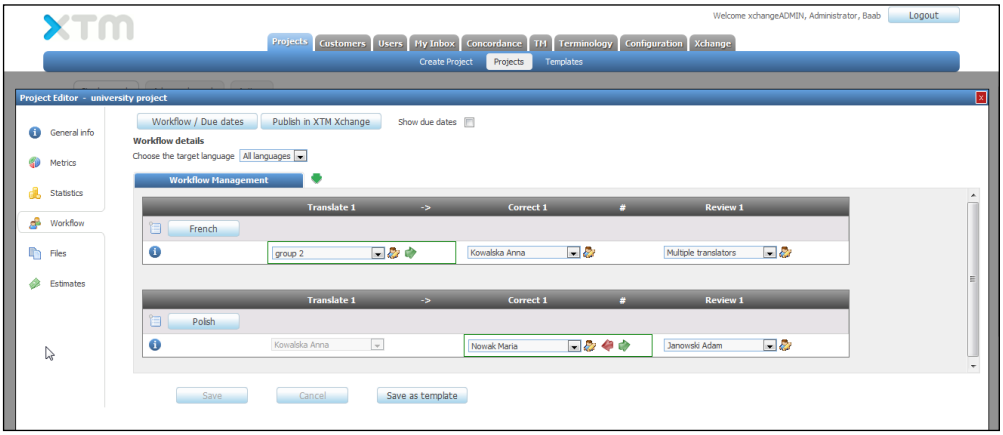

Figure 3. Screenshot of XTM Cloud Workflow Mangement
Source: Own work

The role field allows the project manager to determine the type of user (see Figure 3 and Figure 4). This is why the roles are selected and assigned to each user. Multi-tenancy makes every user benefit from real-time sharing the collective results, which delivers the on-demand and elastic scalability of the cloud with the 24 x 7 relibility and performance.

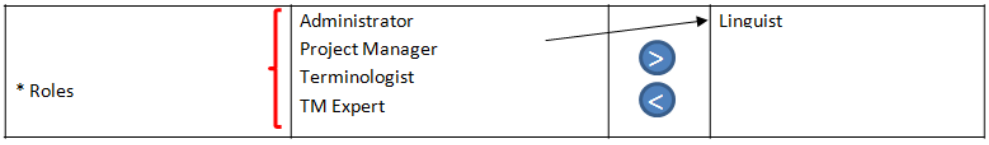

Figure 4. Role field in XTM Cloud. Adding a new user

Source: Own work

This approach reflects the orientation that collaborative work should not be ignored as this is students` future professional environment as CC tools will become increasingly important in translation industry.

3.3. Survey

This section discusses the opinions of 15 students that have been members of the Academic Group of Implementing Good Practices using New Technologies UniCAT (*Koło Naukowe Studentów Wdrażania dobrych praktyk z wykorzystaniem nowych technologii UniCAT*) that was launched in September 2013 at the Department of Foreign Languages. *UniCAT* is designed in order to offer a range of possibilities to implement more CAT tools that have proved to be useful not only in the translation industry but also in the labour market and education sector. Furthermore, *UniCAT* participants are familiarised with audiovisual translation, subtitling, digital usability and accessibility as well as cooperation with charity organisations such as Translators Without Borders (TWB).

Participants of the new academic group were asked to provide opinions as to how machine translation (MT) may prove useful in cloud computing. Fifteen students answered the questionnaire that was conducted in May 2014. With regards to the participant`s subjective opinion on the effectiveness of deploying digital infrastructure and technical support (particular for faculty), the results are presented in Table 1.

Analysing the results presented in Table 2, the majority of *UniCAT* participants were satisfied rating the online CAT tools with 1 and 2, which shows that such cloud tools are urser-friendly, easy, intuitive and advanced. Taking into account the issue of interoperability (supporting translators with transferring digital files from one digital tool to another without any problems), 7 students (39%) rated Wordfast Anywhere (WA) as intuitive and easy. As many as 9 participants (50%) rated GTT with a 2, and 10 (56%) claimed that GTT was easy. Then, as many as 9 participants (50%) were satisfied with WA, rating this cloud-based tool as user-friendly. In the field of friendliness, 8 (44%) claimed that GTT was user-friendly. Students were also familiarised with XTM Cloud, yet only WA and GTT have free access without any time limit. This questionnaire provides evidence that online-accessible tools are basically a collaborative web-based translation memory having progressively made its way into contemporary translation and digital classrooms (Kelly 2005: 15). As students like learning-by-doing, which should be of high priority in translator training, this range of extra course time provides them with the possibility of learning and implementing translation strategies in the real time. Taking into account the above mentioned CC tools, the emerging strategies make both students and trainers forward-thinking, which "predicts the co-evolution of education and technology up to the year 2040." (Marquis 2012)

Table 1.

Evaluation of selected online CAT tools – the opinion of UniCAT participants (with -2 being the lowest and 2 the highest)

Wordfast Anywhere						
	-2	-1	0	1	2	
simple	0 (0%)	4 (22%)	**7** (39%)	6 (33%)	1 (6%)	**advanced**
non-intuitive	0 (0%)	1 (6%)	5 (28%)	**7** (39%)	5 (28%)	**intuitive**
difficult	0 (0%)	1 (6%)	4 (22%)	**7** (39%)	6 (33%)	**easy**
user-unfriendly	0 (0%)	0 (0%)	**9** (50%)	5 (28%)	4 (22%)	**user-friendly**
Google Translator Toolkit						
	-2	-1	0	1	2	
simple	5 (28%)	2 (11%)	**6** (33%)	1 (6%)	4 (22%)	**advanced**
non-intuitive	0 (0%)	1 (6%)	5 (28%)	3 (17%)	**9** (50%)	**intuitive**
difficult	0 (0%)	2 (11%)	4 (22%)	2 (11%)	**10** (56%)	**easy**
user-unfriendly	0 (0%)	1 (6%)	4 (22%)	5 (28%)	**8** (44%)	**user-friendly**

Source: Own work

CONCLUSION

Globalization enables users to be involved in the global information society. Technology advancement connects computers and digital content in digital calssrooms. Even if many translators as well as academic teachers have demonstrated negative attitude towards adopting new digital tools, the higher education should not be reluctant to implement innovative programs into higher

education translation programmes. In the 21st century, translation technologies will be an important segment of opportunity for many firms to follow the trends towards cloud service, shared platforms, and open business models. This direction should be treated as a paradigm as there is an illustration of similar solutions and actions that provide a fremwork of concepts and procedures that education sector is systematically taking into account.

The emerging strategies discussed in this paper provide a framework of patterns for scholars who are forward-thinking and insightful. In this perspective, a new issue of employing in translation sector and new curricula need to be tailored and integrated.

This is why, to understand the most fundamental 21st century skills for trainee translators to be successful in their career, it would be a good idea to discuss the EMT competences proposed by the European Commission (EC) , which "predicts the co-evolution of education and technology up to the year 2040." (Marquis 2012) Cloud computing and social media can be treated as new territory and important distribution channel for products, web services and scientific research.

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IMPLEMENTING BLOGS FOR TEACHING ACADEMIC WRITING SKILLS IN MULTICULTURAL GROUPS: ENLISH M.A. STUDIES COURSE AT THE UNIVERSITY OF SOCIAL SCIENCES AND HUMANITIES (SWPS) – A CASE STUDY

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Abstract: *"A shift is taking place in the focus of pedagogical practice on university campuses all over the world as students across a wide variety of disciplines are learning by making and creating rather than from the simple consumption of content "(Horizon Report 2014:14). For the past ten years, we have observed an enormous influence of technology development on the methodology and practice of teaching academic writing skills. The shift has occurred from paper and course book based activities through blended courses on the Moodle platform to the implementation of blogging and hands-on student experience in e-material design. The author has observed that this development has led to very positive outcomes in terms of the effectiveness of teaching writing skills and students' attitude, in general, to e-learning in the academic context. The paper focuses on the example of the successful implementation of online blogging in the multicultural group of M.A. English studies students thanks to the development of intercultural competences, collaborative work and intrinsic motivation.*

Keywords: online blogging, academic education, writing, intercultural competence

1. INTRODUCTION

An academic writing course sequence is of fundamental competence building importance both on the B.A. and M.A. levels. Jordan (1997: 164) believes, "As [it] is so important for students of all kinds, and as it is such a wide umbrella term, it is hardly surprising that there is range of approaches and types of practice for it. Sometimes these depend upon an underlying philosophy, sometimes upon a starting-point of the students, sometimes upon the purpose and type of writing, and sometimes simply on personal preference." There is a wide choice of academic

writing course books and online materials, such as: *Writing Academic English*, and *Introduction to Academic Writing*, by Alice Oshima and Ann Hogue, *Sourcework. Academic Writing from Sources*, by Nancy E. Dollahite, Julie Haun, Ilona Leki's, *Academic Writing. Exploring Process and Strategies, Owl at Purdue* – the best online academic writing lab, to mention just a few.

Most of them employ the product approach. According to Jordan (1997), this approach is also known as "rhetorical- functional" or "functional" and has "an initial concern with sentences and paragraphs," which serves as a preliminary stage, leading in effect to "essay development with its structure of introduction, body and conclusion." (Jordan 1997: 164) In fact, in this approach, learners are given model texts and various drills, so that learners produce "a similar or a parallel text" (Jordan 1997: 165). The second prevailing approach (comp. Leki's course book) gives emphasis to the writing process itself, and thus is more suitable for more advanced and experienced students. It "[encourages] individuals to take more responsibility for their own learning. By means of discussion, tasks, drafting, feedback, revisions and informed choices, students can make clearer decisions about the direction of their writing." (Jordan 1997: 168) Moreover, the tasks involve: self-editing, peer review, drafting, revising, editing, which all add to the learner's autonomy.

All of academic writing course books, irrelevant of the employed approach, devote a lot of attention to the theory and practice of using and documenting sources for academic purposes. The basic writing course syllabus will focus first on the skills of summarizing and paraphrasing, and the issue of plagiarism.

However, the question arises whether in the M.A. academic writing course curriculum there is a need to use additional online activities that would add extra value to regular course books in boosting reading and writing skills by means of hands-on experience. It is also worth discussing what contents would be particularly useful for digitally fluent students with advanced learning skills. This issue becomes particularly worth addressing in the times of many foreign students deciding to study in Poland and the current need to incorporate the intercultural competence in the syllabus.

2. ENGLISH STUDIES M.A. WRITING COURSE CURRICULUM

The M.A. students, who are required to develop competence in academic reading and writing sufficient to complete and defend M.A. theses should be able to "read for information, study and contextualize academic texts, write, present and justify [their] opinion, compare and contrast [their] evidence and opinions, evaluate ideas, document sources in an appropriate style. " (SWPS "ARAW1":2013-2014) The authors of a renowned academic handbook, *The Craft of Research*, Booth, Colomb and Williams provide a core structure of any academic, political, commercial written argument, whose particular elements should be the learning outcomes of a writing

skills course, i.e. claim because of reason based on evidence (2008: 103-150). These scholars teach how to formulate opinions as a result of our analytical skills based on research and with regard to our readers. These experts also pay attention to developing social competences, such as: time management, team work, self-study skills, copyrights issue, etc. One chapter is devoted to style. It is not surprising as Joseph Williams is the author of the highly acclaimed *Style. Ten Lessons in Clarity and Grace.*

In addition to printed course books, academic teachers have access to academic online resources, some of superb quality (*Owl at Purdue Writing Lab*, or additional course book materials), either of general access type or restricted. Many academic centers work on e-learning platforms, linking to these resources and/or providing their own tailored texts and drills. For the past ten years, we have observed an enormous influence of technology development on the methodology and practice of teaching academic skills. The shift has occurred from paper and pen based activities to computer based resources and drills. It is visible in the way the documentations styles (MLA, APA, Chicago) have adjusted to these changes and in the way the Internet has changed the research process. Booth, Colomb and Williams in an interview promoting the fourth edition of their highly acclaimed *The Craft of Research*, say:

> *When we wrote the first edition, online research was neither as easy nor as common as it is now. In fact, it was little more than a crapshoot. You were unlikely to find much, and couldn't trust what you did find. So, while we offered some advice about using the Internet carefully, our main advice was to stick to libraries. Today, online research is easy; it's the first—and often the only—place students go for sources. But it's still a crapshoot. You'll find more reliable sources than ever before, but you'll still find worthless ones, and a lot more of them. So more than ever students need to know how to tell the difference*.("An Interview": 2014)

This paper focuses on process approach as employed in *Writing Skills: Study and Teaching* course, aimed at the SWPS M.A. English Philology students, taught in the academic year 2013-14 by the author. The course aims were, among many "to acquaint students with various methods and techniques of teaching writing used in different contexts for learning, to provide students with critical and analytical skills that will help them conduct a comparative evaluation of different teaching methods and language teaching materials." (SWPS "Writing Skills" 2013-2014)

3. STUDENTS BECOME E-AUTHORS

It was a blended course, which involved self-study, obligatory Moodle based activities. The course was a part of the specialization module, i.e. Teaching English as a Foreign Language. The group members were very experienced in ICT usage.

They had been trained not only in the Moodle based tools, but also in creating their own materials with the use of technology, including many hours spent on the Interactive White Board. Therefore, it was an ideal group to provide them with "hands-on" experience, to make them learn by making rather than just consuming what had been prepared for them. Some of these students were the SWPS B.A. studies graduates, so their experience in the e-learning platform spanned over five years of the studies program. It is undeniable that the shift from users to makers has changed the students' perspective by shifting from extrinsic to intrinsic motivation.

The students enjoyed creating their own quizzes, being sometimes stricter than their e-learning supervisor. They even asked for more than initially planned, practice in creating their own Moodle based writing activities. That was surprising as we observed students' rather negative attitude towards obligatory e-learning. The possibility of creating own online materials has given these future teachers motivation to develop their own competences by the use of their creativity, interests and skills. It also allowed for shaping intercultural competence (Fig.1). Moreover, it has positively changed their attitude to e-learning in general. It resulted in their more emphatic attitude to the creators of the e-learning self-study materials as a result of a better understanding of the medium.

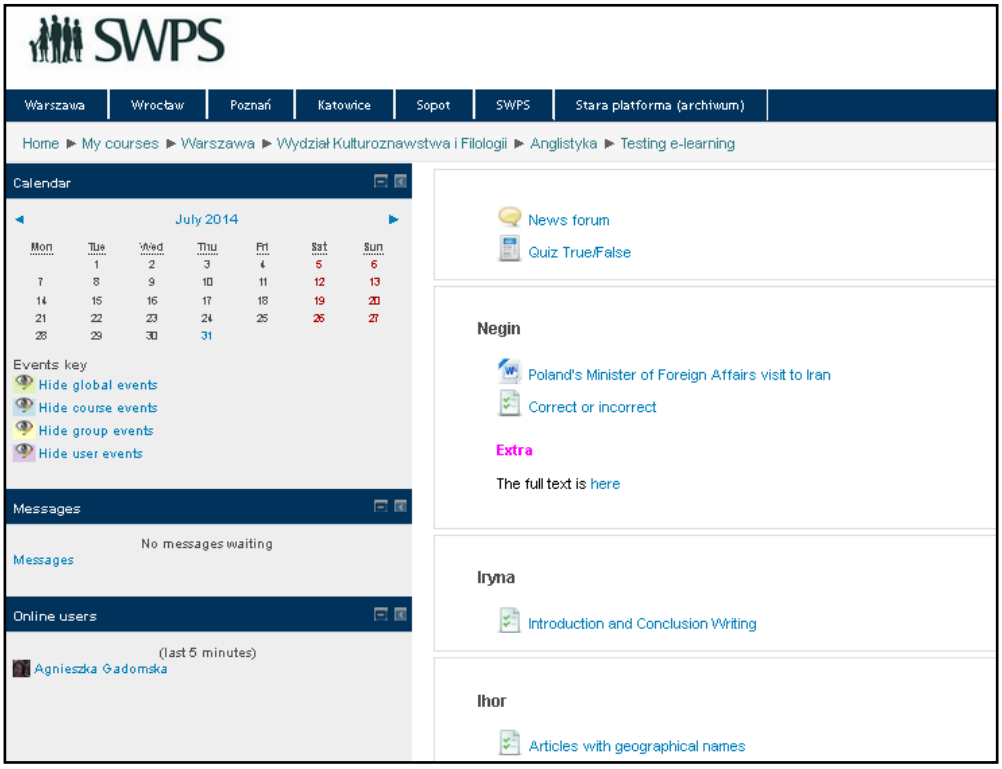

Figure 1. Testing e-learning. Students as authors of the e-content on the SWPS Moodle platform

Source: *www.swps.edu.pl*

4. SHAPING INTERCULTURAL COMPETENCE

ICT gives both teachers and learners a unique chance to incorporate into the syllabus specially tailored materials. All available resources for teaching writing are targeted at general audience and are written by either British or American authors. Therefore, there is no content related to students' native culture or language. Shaping communication in the mother tongue or intercultural competence are very important for the development of language skills and foreign language education. Creating original resources helps to meet students' expectations and interests and in effect boost their reading, writing and speaking skills.

According to Hanna Komorowska (2006: 63-77),

> *Brief, information oriented, business-like approach to socio-cultural knowledge is considered insufficient. In the European documents knowledge is seen as a sine qua non for a more important aim, i.e. the development of intercultural competence in the young people. This involves skills to observe, to suspend judgment, to reflect on one's own culture, to compare behavior and cooperate with representatives of another culture in spite of differences or even in spite of the lack of acceptance (...) Providing a variety of cultural content is not enough. What should not be forgotten is the evaluation of the educational attainment in this field. This can be done in the form of projects, mini-essays, logs or portfolios to assess the learner's ability to use different sources of information, deal with discrepancies, identify stereotypes and situations of potential conflict as well as to assess his/her capacity to explain an aspect of a foreign culture to a person from one's own culture or to reflect on aspects of one's own culture when dealing with representatives of another culture.*

The group in question consisted of 19 foreign students (from Ukraine, Nigeria, Russia, Iran) and 7 Polish students. Having at least extra 15 hours of online work at my disposal, I thought about creating a special blog, a project whose primary aim would be to boost the students' writing habit. In the academic writing curriculum there is little time to practice creative writing, journal writing or any other activity that will encourage students to write for pleasure and every day. Therefore, with the focus on the use of multimedia based technologies and having a group of very well trained in ICT tools, international students, I have decided to open a blog, entitled *Writing Class M.A.- Using Blogs for TEFL* on Wordpress.com.

5. USING BLOGS FOR TEFL

As I believed the blog would be our in-class journal, meant for language practice with feedback, comments and communication channel, I kept the blog restricted only for the use of class members. The students were required to post at least three

blog posts and three comments, but in fact they posted many more throughout the semester (Figure 2).

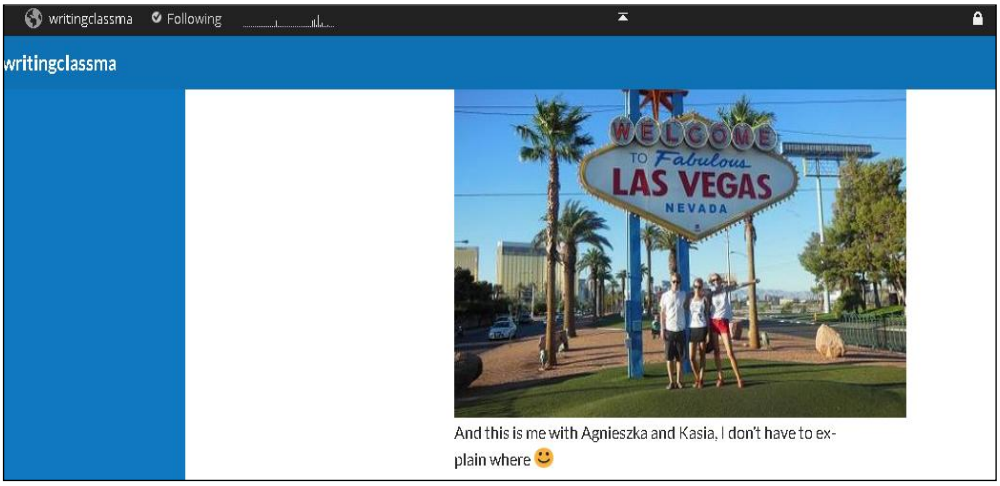

Figure 2. Writing Class M.A. blog
Source: www.wordpress.com

Before starting the blog, students had one class training in blogging and discussed the possible topics they wanted to share. It turned out that at least two students from the group had already had their own blogs devoted to their hobbies (cooking, fashion and video games) and that all students were very eager to start the new project. Blogging by all means utilizes the process approach to mastering writing, which is learner-centered and boosts learner's autonomy by encouraging to take responsibility for one's own writing (Jordan). It also uses, such activities as: discussion, peer and teacher feedback, drafting, revisions. It is highly motivating as the medium is very popular among students, who use it (actively or passively) in their spare time and the content is of their own choice. Users also "can make clearer decisions about the direction of their own writing" (Jordan 1997: 168). Apart from the text, they provide pictures, share links to other resources and leave comments. Academic writing classes are usually considered by students to be demanding, difficult, repetitive and sometimes boring. Moreover, the prevailing style is formal or semi-formal, thus, giving little space to spontaneity, fun and pleasure. It is writing to prove one's opinions against well done research. It is evaluated and graded. Therefore, blogging by definition allows more freedom, creativity and is a proof that students are sometimes even more digitally fluent than teachers, which in effect boosts their motivation.

Writing Class M.A. blog had 19 authors and one editor; therefore, it was a mix of topics, cultures and interests. I have observed that even the most silent students in a regular class were open and active on the blog's dashboard. Starting modestly (also due to the teacher's lack of previous experience in blogging), the project self-fuelled, developing each day with new posts and comments. The final effect can be

compared to a salad bowl cultural concept. Each author utilized his or her own cultural background, shared his or her own hobbies, talents, opinions and knowledge. The emphasis was not on the structure and form (because this was automated to a large extent) but on the content, attractiveness and response to the readers' needs and expectations. Booth, Colomb and Williams in *The Craft of Research* introduce the journalistic formula to be used in writing research papers: I am writing on the topic of… because I want to find out…. (what? who? where? why? etc.), so my readers understand better …… (what?) (2008: 29-66). While it is very hard to convince M.A. students that they should have the audience in mind when writing for academic purposes, blogging makes it apparent that in the writing process, readers play a crucial role. Therefore, it is a very effective tool in teaching academic writing skills.

The status of students, i.e. as authors rather than contributors gave them more satisfaction and freedom in, for example, illustrating their texts by figures, photographs; however, they were obliged to document each external source used. Having had regular classes with the same group during the previous semester, I learned less about them than from the blog. It shortened the distance and gave a unique opportunity to learn about their amazing cultures, undeniable talents, interests and discoveries. It made the official school context less formal, and life-bounding experience. For example, the bloggers shared recipes (process paragraphs) from different cuisines, descriptive passages about Italian, Nigerian, Iranian, Ukrainian, Polish, American, Chinese cultures, argumentative posts about methodology of teaching, ICT in teaching, motivation, politics, history, work and travel experience, reviews about video games, literature, films, etc. So they practiced different genres and the language. They reflected as authors on their own culture and on the cultures of other group members (posts, comments). They "translated" the elements of their own culture to the group's needs (Figure 3-7). It is undeniable that the success of this blog resulted also from the fact that it was just one of the tools used in the blended learning course. Other activities involved the e-learning self-study component and 30 hours of regular class work.

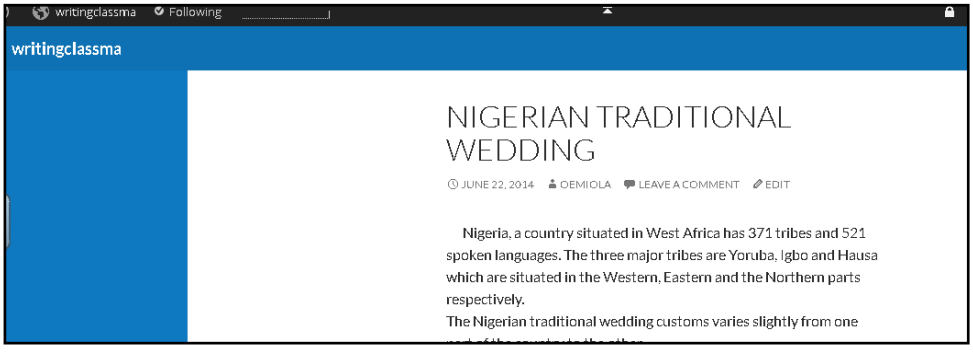

Figure 3. Writing Class M.A. blog

Source: www.wordpress.com

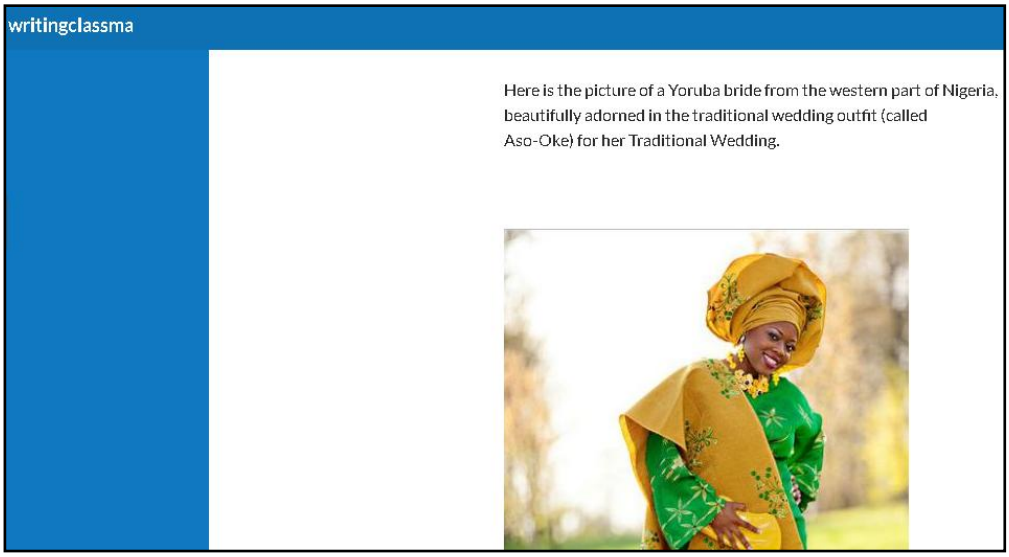

Figure 4. Writing Class M.A. blog

Source: www.wordpress.com

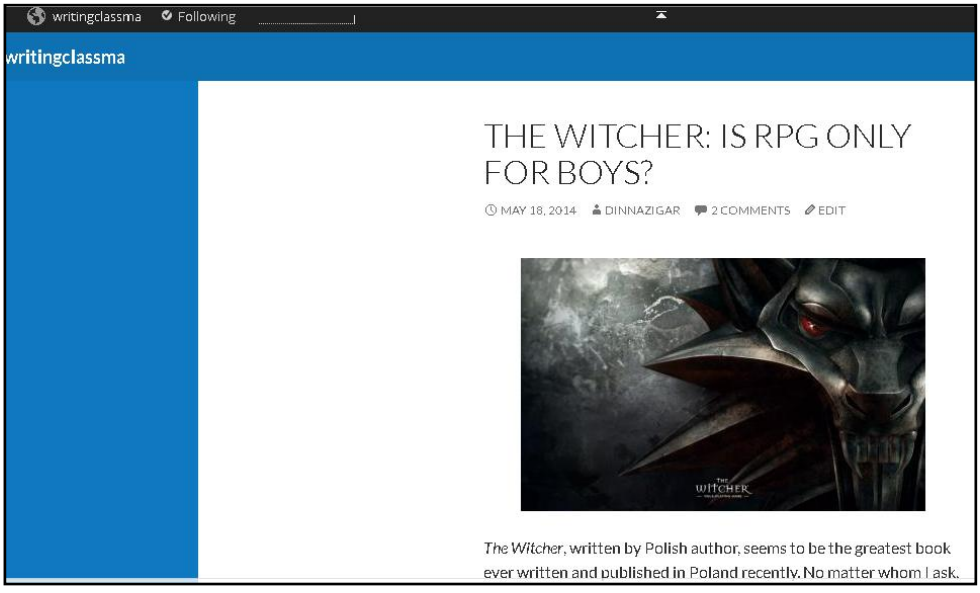

Figure 5. Writing Class M.A. blog

Source: www.wordpress.com

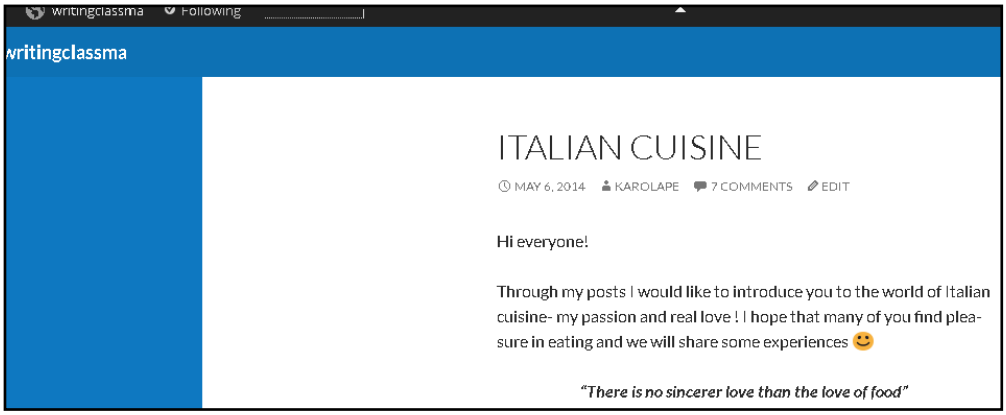

Figure 6. Writing Class M.A. blog

Source: www.wordpress.com

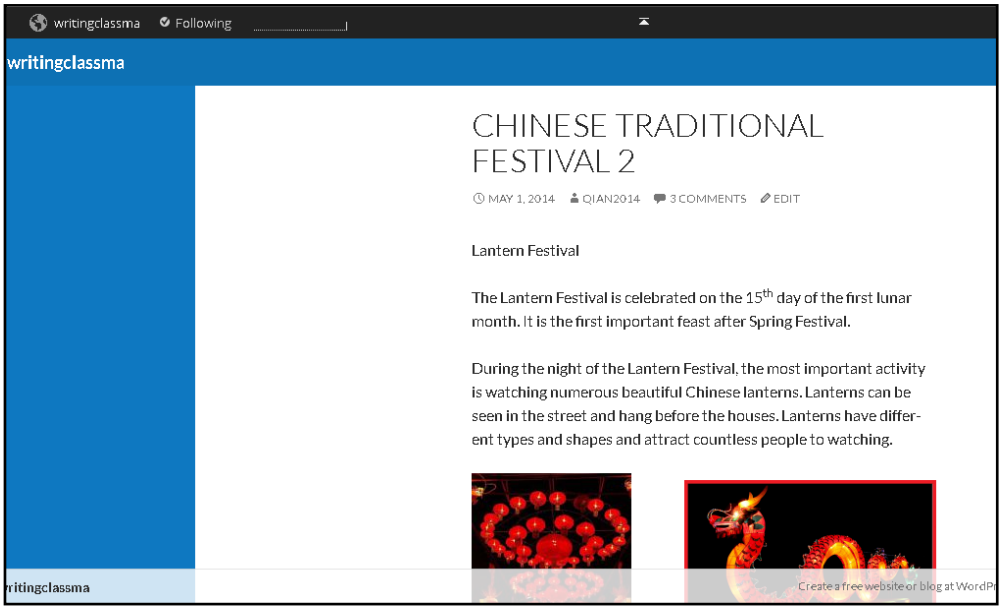

Figure 7. Writing Class M.A. blog

Source: www.wordpress.com

6. CONCLUSION

The authors of *Horizon Report 2014* believe that

> *There is a growing trend on university campuses in which students are doing more content creation and design, across the spectrum of disciplines. More colleges, universities, and libraries are developing environments and facilitating opportunities to harness this creativity and building physical spaces where students can learn and create together, integrating content-and product-centered activities as part of their instruction. This trend is gaining strength and should reach its full impact in about three to five years.* (2014: 14)

The author has observed that this development has led to very positive outcomes in terms of the effectiveness of teaching writing skills and students' attitude, in general, to the use of digital technologies in the academic context. It also helped in shaping intercultural competence by personalizing the learning experience (the concept also promoted by the American authors of *Horizon Report* 2014). This learning objective is becoming more and more important especially nowadays when we observe a growing number of international students joining Polish academic institutions. As Hanna Komorowska (2006: 68) claims, one of the aims of intercultural education is:

> *to raise the learner's awareness of the influence of his/her own culture on his/her*
>
> *perceptions of self and others, to raise the awareness of differences and of stereotypes, to develop skills to observe, interpret, sustain judgment and cooperate with others in spite of a possible lack of acceptance, to train strategies of behavior and communication appropriate in a given context.*

Online blogging seems an ideal genre for boosting not only language and communication skills, but also social, cultural competences in foreign language education, especially in mixed nationality groups. It has to be observed, however, that these aims require training in digital fluency of teachers, shifting their role from sole content providers to content coordinators and supervisors, giving learners more "hands-on" practice and creative freedom. It is hoped that such an attitude will result in a highly rewarding experience, as it was the case with the M.A. writing class blog (Figure 8).

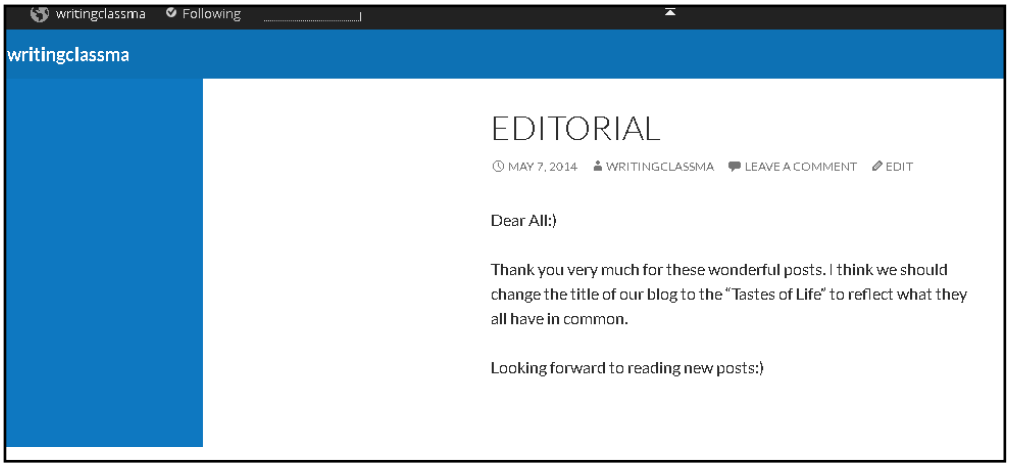

Figure 8. Writing Class M.A. blog

Source: www.wordpress.com

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IV. DISTANCE LEARNING OF SCIENCE AND IT

E-LEARNING IN HIGHER EDUCATION - A CASE STUDY

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Abstract: *The article discusses the use of the Moodle platform to support the teaching process at the Faculty of Chemistry of the Adam Mickiewicz University during the project AMU: A Unique Graduate = Possibilities. Improving the didactic potential of Adam Mickiewicz University through innovative education in English, interdisciplinary approach, e-learning, and investments in the staff" (co-funded by the European Union within the European Social Fund). The platform is currently used to support the classes conducted in a traditional way.*

Keywords: e-learning, b-learning, Moodle, chemistry

INTRODUCTION

The generation, which is currently beginning their studies cannot imagine life without the internet - one of the most important sources of information. For young people it is not only a meeting place, but also a space where they can deepen their knowledge and develop their interests. Through the Internet they communicate with others, make purchases and transfers, order food, arrange meetings and read the news. For them, Internet education is an additional use of this medium.

Accustomed to easy access to the contents on the Internet, and their repeated playback, they are discouraged by situations in which the teacher only briefly shows the image (sometimes poorly visible or in low quality), or they are expected to redraw a complex table or graph, or the teacher speaks about a film or an image, but does not show it. E-learning is an attempt to rise above these limitations, adapting the learning process to the mentality and habits of ~~a~~ generation 2.0.

E-learning throughout the world is growing rapidly, contributing to changes not only in the educational systems of individual countries, but also in other areas. With e-learning we learn, work, use cultural goods differently (Penkowska 2010).

Successively conducted analyses show that a well-functioning education system is the foundation of prosperity and prospects of the development of the modern state. This system should be developed and improved in order to allow everyone to educate themselves throughout their lives, because knowledge and skills gained in school will be insufficient for life. At the same time the belief that the educational system based on the traditional idea of the teacher - student relationship in the classroom system, developed in the nineteenth century, does not meet the challenges of the twenty-first century is becoming more and more popular (Susan, 2006; McInsosh, 2005).

Therefore, more and more universities, both public and private, begin to use e-learning platforms in the educational process. They offer solutions at different levels, ranging from simply sharing course materials in electronic form available on the Internet, to tutoring systems at every educational stage (Najnoszewski 2003).

1. THEORETICAL BACKGROUND

According to the constructivist learning theory the learners themselves should organize the content - "redesign it" for the benefit of their own education. Therefore, it is opposite to early constructivism in architecture which concentrated on building something and thus visualizing perfection in a certain fixed structure design. The task is to constantly redesign, similarly to playing with blocks - in this sense, the constructivist approach owes much to the theory of play by Johan Huizinga (2008). Two different views dominate here. Some authors are inspired by the epistemology of Immanuel Kant (2010), according to which the object of cognition is constituted by the knowing subject, engaging him in a category of causality, time, space, or the moral sense. Sociologizing Marxist followers of this approach often refer to the co-creation of reality by the subject of knowledge which is understood as a social entity (eg, a group or social class; Siemek 1977) – a similar line of reasoning was developed by early postmodernists such as Jean-Francois Lyotard (1979). However, Kant seems to approach constituted objects with greater understanding than constructivist treat his followers (Which, 1993). Kant's approach to constructivism in "e-mentoring" was presented by Zbigniew Meger (2006).

Another theoretical basis for the adoption of the constructivist model of education is the belief that knowledge is now so complex that a teacher cannot "teach" in the strict sense – he or she can only support the search for knowledge by students, either individually or as part of group work (Bałuć 2011).

According to the assumptions of constructivism, widely recognized as a fundamental theory about teaching and learning through the Internet, in this system the role of the student and the teacher is substantially changing. The learner is the

subject in this process, and knowledge is a dynamic process of its interaction with the world. The process of acquiring knowledge is the discovery of the laws governing reality. Online lecturer-instructor accompanies the student in the process of exploring the world and helps him to understand the objective reality and apply the acquired knowledge. This places significant demands on the teaching materials which should be designed to assist in discovering the reality. That is why the content of the lecture is replaced by a large number of examples and tasks which require the formulation of conclusions and observations and the search for alternative solutions. A student who has to find a solution to the problem, tries to acquire for this purpose necessary knowledge. Doing so is more efficient than receiving a portion of information to remember, and only later learned how to apply them.

In the United States and in many countries that have modeled their education systems through the Internet based on American solutions and experiences, it is assumed that the foundation for the online courses' creation is Instructional Design. It sets out the principles of the theory of educational curriculum leading to developing students' activity. Gagné formulated universal 9 steps (basic components) of instruction, generally regarded as necessary in the design of online courses. These include:

1. Motivate the Learner;
2. Explain What is to be Learned;
3. Recall Previous Knowledge;
4. Present the Material to be Learned;
5. Provide Guidance for Learning;
6. Active Involvement;
7. Provide Feedback;
8. Comprehension Test;
9. Provide Enrichment or Remediation (Zając, 2004).

2 A CASE STUDY - UNIVERSITY-WIDE PLATFORM

Currently, at the Adam Mickiewicz University a university-wide platform is being created, which will brings together all departments, including the Department of Foreign Languages, the Ecological Station, Library, Career Office Services. As part of the project *UAM: Unique Opportunities Graduate = Opportunities*" server was purchased and Moodle platform installed. Each of the 13 departments represented by the coordinator (Department coordinators, 2014). The E-learning platform consists of separate instances of Moodle.

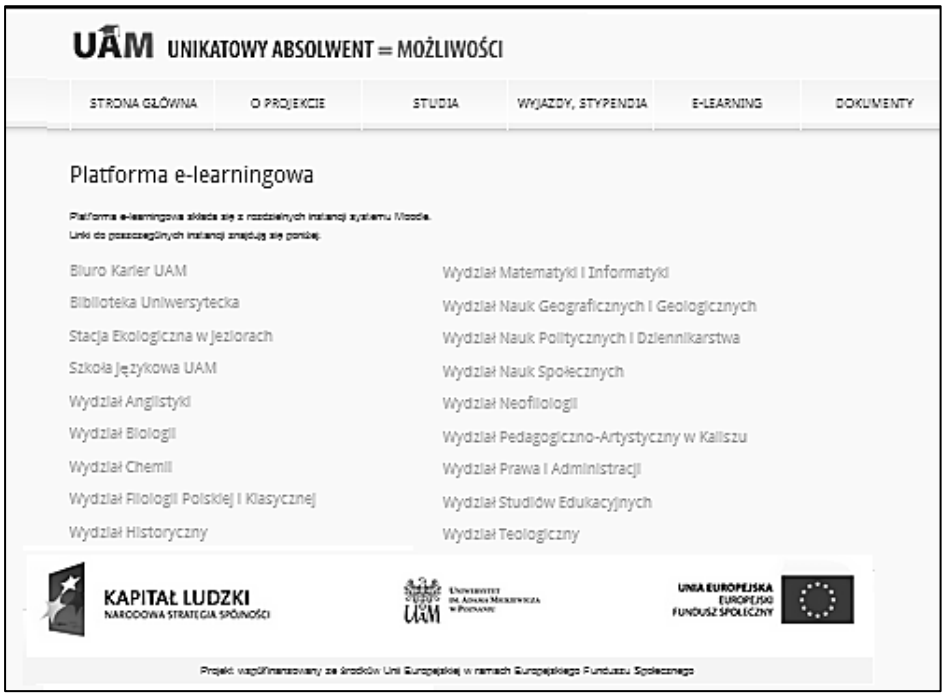


Figure 1. Homepage Moodle AMU created during the project

Source: Author's archives

BRIEFLY ABOUT THE PROJECT

"UAM: Unique Graduate = Opportunities" is the largest project funded by the European Social Fund, implemented at the Adam Mickiewicz University. In this project, new specializations and doctoral studies are launched, an e-learning platform is built and teaching staff of AMU are educated. It all aims to make it easier for AMU graduates to find work and be valued employees. The Project *"UAM: Unique Graduate = Opportunities. Growth of the Adam Mickiewicz University's didactic potential through innovation-oriented education in English, interdisciplinarity, e-learning and investment in human resources"* started on 1 July 2010 and is going to end on 31 December 2015. It was funded under Priority IV Higher Education and Research, Measure 4.1. "*Strengthening and developing of the didactic potential of university and increasing the number of graduates in fields of key importance for knowledge-based economy*", the Sub-measure 4.1.1 Strengthen the capacity of university teaching (Contract No.: UDA-POKL.04.01.01-00-019/10-00).

2 1 Preparing content

Preparation of educational electronic materials for the courses can be approached in two ways:

- in an organized form - where each item is a separate entry implemented by a team of specialists,
- in an individual form - where the teacher herself/himself, after training, creates educational materials for matters presented by him.

  Materials are developed, tested and refilled while working with students (blended learning).

Constructing the electronic educational materials by teachers themselves (individually) somehow forces them to improve their skills in this area. Courses on techniques and technology of e-learning and workshops on the use of IT tools will bring many benefits in the form of much higher efficiency in e-learning and improving e-courses planning skills. Courses created by the teachers can also be a great foundation material for the production of professional and high-tech e-learning courses (Komorowski 2006).

Therefore, academics (professors and visiting professors, assistant professors, assistants), teaching staff (senior lecturers, lecturers, teachers, instructors), qualified librarians and certified employees of documentation and information science (curators, documentary certified, qualified curators, library assistant professors, assistant professors of documentation and information science, library assistants, assistants, documentation and information science) were offered five-week e-learning courses prepared as a support, while creating and managing their courses. The course's programme includes preparing digital materials, e-learning platform handling, distance learning methodology, legal issues, and specialized courses.

A detailed programme of the course:

"Law and new technologies"

1. Institutional cooperation during the preparation of materials

2. Preparing materials for remote and complementary courses

3. Intellectual property in the process of creating materials for distance education

   3.1. Basic legal concepts of intellectual property protection

   3.2. Standards of the protection of property

   3.3. Licenses - types, characteristics, legal opportunities to use

   3.4. Commercial and noncommercial software - application in designing and creating materials for distance education

4. Copyright and ancillary rights

   4.1. Scope and protection

   4.2. The content of copyright

   4.3. The transfer of rights

4.4. Protective mechanisms

5. Electronic agreements,

6. The intellectual and industrial property

"Composition of contents, formatting materials"

1. The organization of content,

2. Designing the presentation of content,

3. Text collection and formatting,

3.1. The consequences of a format transfer,

3.2. The basic principles of typography,

3.3. The functionality of colors,

3.4. The importance of templates,

4. Power Point

"Methodology of e-learning"

1. What is e-learning?

2. What is a b-learning?

3. E-learning as a process

3.1.Skills associated with traditional teaching,

3.2. Skills required for e-learning

3.3. The ability to communicate

3.4. Teamwork and learning in collaboration

4. The taxonomy of learning objectives

5. The principles of e-courses' construction

6. Courses in b-learning system

7. Evaluation and feedback

8. Evaluation

8.1. Technology of the on-line evaluation,

8.2. Technical solutions for web evaluation

9. The standardization of materials

10. The role and obligations of the system of distance education

11. Courses' manuals

"CMS - the creation and management of course material using tools Moodle"

1. Content Management System, which is about creating materials

    1.1. Icons, or how to edit the resource exchange

    1.2. Add a resource

        a) Insert a label.
        b) Create a text page.
        c) Create the HTML page.
        d) Link to the file and the Web page.
        e) Display directory of files.
        f) Add the IMS package.

    1.3. Add Member

        a) Poll
        b) Database
        c) Chat
        d) Forum
        e) Vote
        f) Lesson
        g) Quiz
        h) Glossary of Terms
        i) Wiki
        j) Tasks

"LMS - the management of the learning process using Moodle tools "

1. How to manage the process of teaching on the platform?

2. Assigning students to a course

3. Me and my student, or how to communicate through the platform

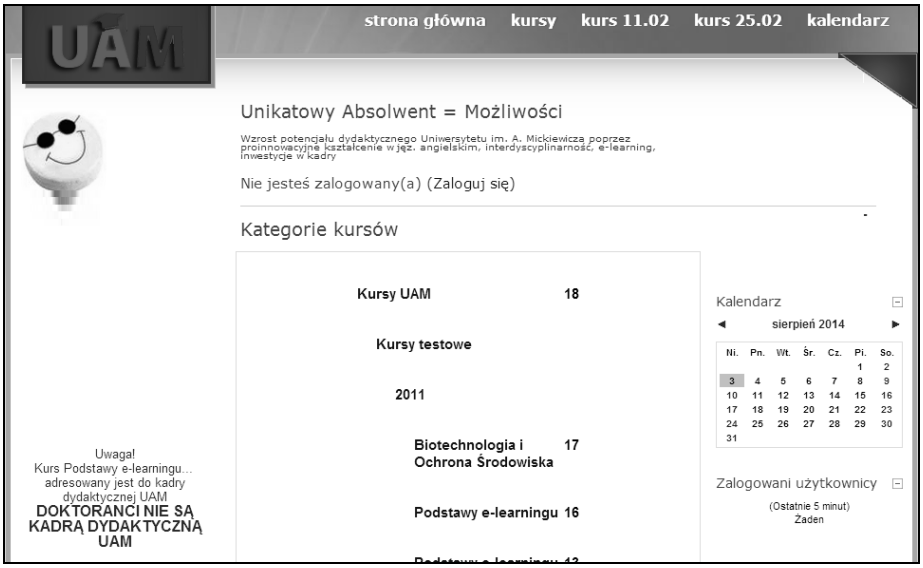
4. Division into groups, group work

5. Activation of students

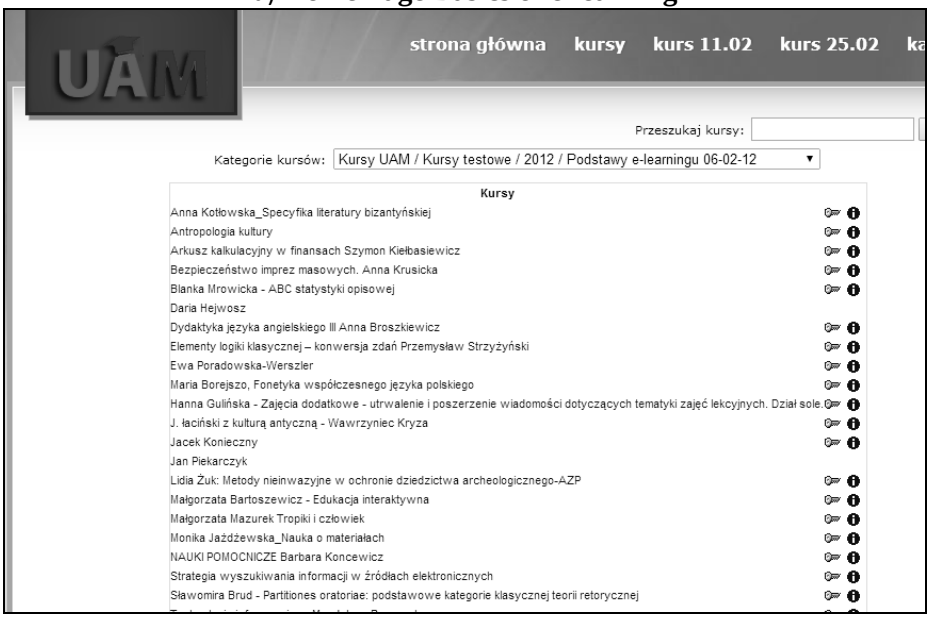
6. Evaluation and control of the learning process

The second part consisted of creating your own course and checking the acquired knowledge and skills in practice – which resulted in constructing about 360 test courses.

Upon completion of the course, each participant receives his certificate, which is required by the University (regardless of previously held qualifications) to create and conduct classes supporting full-time education provided in the curriculum, in the form of blended learning.



a) **Home Page Basics of e-learning**



b) **Sample courses created during the training**

Figure 2. Platform used in the project

Source: Author's archives

2 3 The use of platforms in the department of chemistry

So far the Department of Chemistry Education has had two Moodle platforms, which were used since 2005 to conduct courses for students and teachers in the

blended learning form. One of them served only the purpose of making the course accessible, the second was a test platform on which participants created their own courses, learned how to manage them, and after the end of the classes courses were accessible for a year.

In 2008-2010, in collaboration with Microsoft Poland in the framework of the Partnership for the Future, the teaching staff of the Department of Chemistry Education also tested SharePoint platform during classes, examining its educational usefulness. With the use of the available LMS tools, courses for ~~the~~ students of the Faculty of Chemistry (Adam Mickiewicz University), students of the Faculty of Educational Studies (Adam Mickiewicz University) and for teachers of chemistry were created and conducted (Bartoszewicz, Gulinska 2010; Gulinska, Bartoszewicz 2013).

Figure 3. Faculty of Chemistry, Adam Mickiewicz University Moodle Platform's Homepage created during the project

Source: Author's archives

Currently, all courses are accessible on the platform, and their number is expanding, and so in the academic year 2013/2014 on the platform the following courses were offered:

- for BA students
  - Visual Basic

    Mentor: Dr. Wieslaw Stem. Programming course in Visual Basic for third year students specializing in Chemistry with the applications of information technology. Classes - 45 hours.
  - Information Technology School

    Mentor: Dr. Małgorzata Bartoszewicz. Fifteen-hours course for second year students - the course is a part of pedagogical subjects, in accordance with EU requirements relating to e-learning.
  - Chemistry teaching,

    Mentor: prof. dr. Hanna Gulinska.
  - Essentials of Chemistry - accounting exercises

    Mentor: Romuald Bregier. The course is designed for the first year students, and consists of 30 hours of instruction (from which 16 hours within eight thematic modules)
  - Bioinorganic Chemistry

    Mentor: Dr. Renata Jastrzab. Fifteen-hours course for students in their second and third year covering the issues discussed during the lecture.
  - Teaching aids in chemical education - classes

    Mentor: prof. dr. Hanna Gulinska. The course is dedicated for students of *Chemistry and Nature* and those who selected the path of training to become a chemistry teacher.
  - Teaching aids in chemical education - classes

    Mentor: Dr. Małgorzata Bartoszewicz. The course is dedicated for *Chemistry and Nature* students and those who selected the path of training to become a chemistry teacher.
  - Herbs used in cosmetics

    Mentor: Agata Wawrzyńczak. The course aims to provide basic knowledge of the chemical composition of selected medicinal and cosmetic plants. It will also allow to know the types of plant materials and processing methods to the needs of the cosmetics industry. The standard of cleanliness and the processing of raw herbs will be also discussed
- for MA students
  - Chemical aspects of brewing

Mentor: Dr. Renata Hawk. Lecture with additional materials consist of content describing the process in the manufacture of beer in chemical terms.

- Information Technology II in the school

  Mentor: Dr. Małgorzata Bartoszewicz. Fifteen-hour course for MA students - the course is a part of pedagogical subjects module, in accordance with EU requirements relating to e-learning.

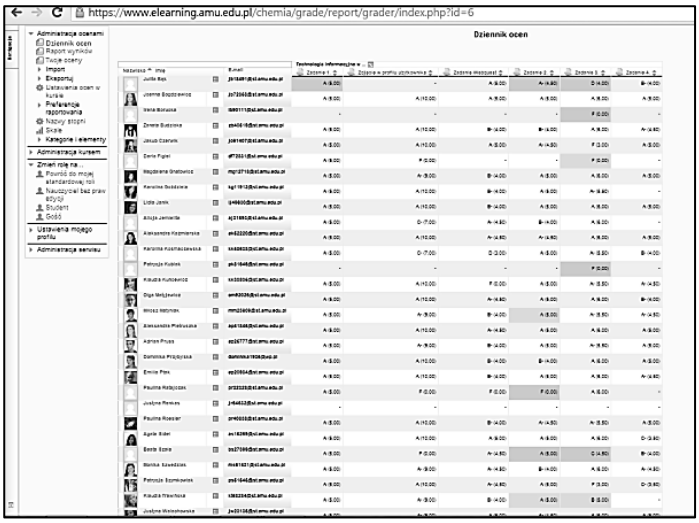
- for PhD students

- Modern methods of teaching chemistry

  Mentor: prof. dr. Maria Ziółek. The course's aim is:

  - familiarizing doctoral students with the changes implemented in the European Higher Education (EHEA);
  - familiarizing with the European, Polish and the National Qualifications Framework and the benefits of their implementation;
  - the knowledge of the management of training quality and development of own training's quality
  - developing skills of creating syllabuses, including proper defining the effect of training and correctly assigning ECTS points;
  - developing the ability to choose the right learning and assessment mode, matching complex educational effects;
  - preparing students to choose and define correct evaluation criteria;
  - developing the competence to use non-conventional ways of training and assessment.

a) Sample course's structure



b) Student's grades

Figure 4. Sample course's page available in Moodle platform
Source: Author's archives

Preparation of good teaching materials for Internet training requires much more time and effort than for traditional teaching. However, it is worth noting, that the carefully prepared materials greatly simplify the actual process of teaching, and the use of courses does not end with their one-time application. They fall permanently into the relevant field's curriculum.

Among the participants e-learning courses (which were prepared, implemented and completed within the project) evaluation studies, designed to assess their quality and attractiveness are conducted.

CONCLUSION

E-learning is a modern way of teaching, adapted to the needs and demands of the present. It saves time and allows you to teach on an individual basis and keep track of the progress of learners. Although the preparation of the course requires more time, these classes can be much more interesting than the traditional and are, in fact more diversified (e.g. in terms of the choice of materials) and require student's active participation. Free access to the materials allows to participate in the course whenever and how long one wants. The teacher has a better and more frequent contact with students and is able to keep track of their progress. Many virtual classes help students overcome shyness and engage in a discussion or ask a question.

However, we must remember that in natural sciences (chemistry, biology, physics) the actual experiments cannot be entirely replaced with virtual, since these do have such a didactic value as a real experiment. Studies have shown that computer support triggered positive emotions in learners (Kozielska, 2008).

This is why it is important to favour during studies the development of these key competences, which will be particularly useful in the career chosen after the completion of the studies, and in this case particularly competences related to the use of information techniques. An effective use of these techniques aims to help adapting to living in the modern digital world.

Through distance learning another competence is being developed - the ability to self-learn and continuous willingness to self-improvement. It is closely linked with the idea of lifelong learning, which is one of the European Union priorities in the ongoing decade, (as highlighted, inter alia, in Europe 2020 Document, which is a continuation of the Lisbon Agenda, adopted on March 3rd, 2010 by the European Commission, Marshal, 2011; Chmielecka, Dąbrowski, 2013).

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SCIENTIFIC COMPONENT OF MASTERS ICT COMPETENCE IN MODERN UNIVERSITY

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Abstract: *The article is devoted to a systematic approach to the formation of the ICT competency of masters in the modern university: development and approval of corporate standard identify necessary and sufficient conditions for its software, development of tools for the evaluation of the ICT competency formation of masters and mechanisms for the integration of ICT in education system. An example of one of the ways of forming the ICT competence of masters in the process of scientific activity by training on a specially designed course of study, which can serve as an example of open course in informal learning, and system evaluation of their formation through the use of the University e-learning resources.*

Keywords: competence, the standard, model of ICT competence, educational electronic environment of the University, e-portfolio of master.

INTRODUCTION

The widespread introduction of information and communication technology (ICT) is a condition of the release of higher education at the level of international standards. This is determined, in particular, that the quality of specialist training of modern university is largely dependent on the ability and willingness to use ICT in order to obtain the necessary knowledge and producing new ones.

The latest technology affect education as it was indicated in the report of New Horizon Report Insists Teachers Use Tech (http://gettingsmart.com/2014/06/new-horizon-report-insists-teachers-use-tech). In particular, the new trends include:

- rethinking of the teachers role - he must be a partner in the learning process;

• desire depth study: in-depth training for students is learning by doing and develop a sense of self-efficacy, the development of critical thinking and effective communication (Fullan 2014).

• focus on open educational resources;

• increased use of mixed (hybrid) learning;

• the use of intuitive technologies;

• rethinking of educational institution - both schools and university.

Integrating ICT in the activities of modern educational institution requires and causes changes in the educational process and scientific research; formation of the ICT competence of teachers, students and researchers; creation of open information learning environments as catalysts to improve the quality of ICT competencies of participants of the educational process of the University in order to develop their skills of XXI century (National Strategy of the Educational Development in Ukraine 2013).

A significant amount of scientific publications are devoted to the issue of higher education informatization (Bykov 2012, Smirnova-Trybulska 2012), the creation of open electronic environments education (Bykov 2010, Morze, Kuzminska, Protsenko 2013), the reorganization of the educational process (Zhaldak 2010, Manako 2013), the use of distance learning technologies (Meyer, Katrina 2014, Dias, Balula 2014). However, in practice there is still a significant gap in the institutional environment of solving their technical problems - ICT alone will not improve performance, but offer opportunities for a large number of new applied technologies.

Issues relating in particular with working off technologies of support acquisition of ICT competency of masters does not lose relevance, since the preparation of masters is increasingly aimed at overcoming the mismatch of model of training future specialists and dynamics of the subject area (in this context ICT); on the needs of the modern labor market, including - the emergence of new professions and Informatization of key business processes within existing; to acquire the skills and ability to make decisions under uncertainty and to effectively use modern ICT for research, including scientific.

The purpose of this article - to offer a systematic approach in shaping the ICT competency of masters and an example of its implementation in the process of science.

Hypothesis of the study, conducted at the Borys Grinchenko Kiev University, is suggested that the formation of the professional level of ICT competence of scientists (masters and postgraduate students), which is a component of professional competency necessary to define appropriate objectives and requirements, establish a system of monitoring and evaluation , which may include corporate standard, evaluation instruments, requirements for environment and the training system.

1. SKILLS FOR FUTURE AND CORPORATE STANDARD OF ICT COMPETENCE OF UNIVERSITY MASTERS.

The results of the Institute for the Future (The Institute for the Future - IFTF) together with the Research Institute of Phoenix (The Phoenix Research Institute) can provide the basic skills of the future, which workers will be required to have in 2020 (Future Work Skills 2011):

- extraordinary thinking;
- social intelligence;
- innovative and adaptive thinking - the ability to think outside the set trajectory;
- Intercultural competence - equally effectively communicate with all business partners and customers, regardless of cultural differences;
- computational thinking;
- the ability to filter out unnecessary information - quickly process and summarize large amounts of data;
- ability to work with modern media;
- knowledge is not limited to their own narrow specialization;
- ability to work remotely.

In addition to the general skills and competencies that will be essential to the successful work of a specialist, regardless of industry specialization include (http://sco.lt/5aIy3N): systems thinking, customer focus, interdepartmental communication, knowledge of several languages and different types of cultures, skills management of projects and people - from local groups to communities, the ability to work in a multi-tasking and conditions are constantly changing, thrifty production skills, art skills.

That is why education needs major changes and innovation, in particular relating to the quality and effectiveness of the educational process.

The problem of quality assurance is continuous in Bologna, Turin and Copenhagen processes, appropriate programs activities implemented at the regional, national and sectoral levels, and at the level of individual schools. Currently, one of the most developed quality management systems (QMS) is a system that meets the standards ISO 9000. In particular, the recognition of the effectiveness of implementation of QMS university is its certification in accordance with ISO 9000: 2000 (http://www.kpms.ru/Standart/ISO_Education.htm). But, unlike the strictly regulated procedures implementing and documenting key business processes of the institution and organization of internal audit for compliance with standards ISO (Zaporozhchenko 2011), monitoring and periodic evaluation of educational programs and qualifications, systematic assessment of students' knowledge,

competence of teachers, educational resources, system informing - is the base of European standards and recommendations of European Network for Quality Assurance in Higher Education (ENQA) [http://www.enqa.eu].

Table 1.

Model of ICT competence of master and criteria of its effectiveness

Aspects of activity of Master	Level of acquisition of ICT competence	Signs	Indicators of evaluation of the acquisition of a certain level
Study of ICT	Basic	Basic knowledge and skills Basic tools	Results of tests for independent verification of levels of basic tools created by the University, and examinations in professional disciplines
	Advanced	Improving knowledge and skills Sophisticated tools	Results of tests for the Microsoft IT Academy; survey to determine the capacity for evaluation of network resources appropriate to the task and the ability to use ICT for teaching, research, and everyday life
	Professional	The ability to self-ICT	Number of successfully completed courses for self-study located in external portals, including English; evaluating the quality of the selection of courses and tools for self-education and communication through questionnaires
Educational Activities	Basic	Application of knowledge and skills	Results of studies using ENK in LMS Moodle and Web 2.0 services
	Advanced	Solving problems competency of educational character	The results of the self-study assignments, course projects and the use of ICT for solving and presentation of results; evaluation of the quality of performance and protection undergraduate work; survey of students' satisfaction on the proposed university e-resources
	Professional	Solving problems competency of professional purposes	The results of the course projects, training and pre-diploma practice; evaluation of the quality of performance and protection of bachelor work; questioning students for involvement in improving the educational process by ICT enrichment

Scientific activities	Basic	The use of scientific communication	Results of students questionnaire on the degree of awareness and use of scientific communication: repositories, scientific metric databases, e-libraries, e-journals, as well as opportunities and participate in online conferences
	Advanced	Scientific cooperation	Results of the questionnaire to determine the effectiveness of the use of e-communications, in particular depositary University and the electronic journal for writing essays, coursework and of bachelor work; ability to build e-communication
		The ability of application of e-Science	
	Professional	Presentation of research results in the form of research project	Assessment results (quantitative and qualitative) of student participation in the thematic online conferences and webinars, the ability to create online scientific publications and present research in network
Social and cultural activities	Basic	Knowledge and skills of citizen knowledge society	Results of the questionnaire for understanding the role of social networks and services to represent their ideas, the ability to communicate and establish cooperation with the preservation of their own identity and respect to network members
	Advanced	Solving general tasks competence	Results of participation in social projects of university, evaluation of social activities and observance of network etiquette of students
	Professional	Presentation of the portfolio	The results of the evaluation of portfolio: teaching, research and social activities of student

Source: Own work

ENQA-standards do not contain ready-made solutions, are descriptive (framework) character on the approach to the principles, techniques and methods in the field of quality assurance of education. A major focus is the participation not only of teachers and employers, but also students in the management and evaluation of the educational process. A feature of these standards is the requirement for universities to develop official (legal) regulations: specific plans of the institution (e.g. http://www.univ.kiev.ua/ua/n20101108/), software quality assurance and corporate standards. One such standard is the standard of ICT competence for masters (Table 1) of Borys Grinchenko Kiev University (http://kubg.edu.ua/), which is based on the recommendations of UNESCO (Structure of the ICT Competency of teachers 2013).

Scientists distinguish between special and key ICT – competence. Key information and communication competence - the ability to effectively use ICT in teaching,

research and daily activities to address the informational and professional tasks. Special ICT competence - is regarded as the student's ability to apply in a particular life, education and research situations, including problematic acquired knowledge, skills, methods for the selection of appropriate ICTs and their use for finding the necessary data, analysis, organization, conversion, storage, transfer in compliance with ethical and legal standards and meet the challenges of the subject area (Morze, Buinytska 2014). In this articles we will consider ICT competency of master as a key competency.

To ensure the specified corporate standard ICT competence of Masters at the University must create a system of its formation and provide appropriate conditions for this. One of the ways of forming the ICT competency of masters is their special training. Analysis of the requirements for masters in Ukrainian universities (http://pon.org.ua/socialny-zahyst/studentski-pytannja/414-zatverdzheno-koncepciju-organizaciyi-pidgotovki.html) gives reason to believe that this scientific activity is a generator of new knowledge and the basis for innovative development. However, the current situation with respect to science universities in Ukraine requires a serious rethink: the organization of scientific activity is in poor funding and resources is often formal, scientific activity divorced from teaching and research, and therefore the most modern masters of Ukrainian universities are not able to join the real scientific work. Quite often a training course chosen by the student "Methods of Research" program which provided the use of ICT, is a single that provides training of scientific research including of master. However, the rapid development of ICT leads to the formation of world space online communications, and this must be considered in shaping students' ICT competence, including in the implementation of research activities, because now more scientific institutions and individual scientists are supporting the open access and transfer the scientific communications and resources into the network. That is why we believe that specialized training on the use of online tools (at the level of the course or module) is effective in shaping ICT - competence. But the introduction of such a course for ICT support research activities may result in improvements in other components as systematic acquisition of ICT competencies provides interconnection and interpenetration of different aspects of the masters activity.

On the recommendation of ENQA learning outcomes stated in terms of competencies, so to construction of system of forming ICT competence must precede the definition of competence (Table 2), which is the basis for the acquisition of the professional level of ICT competence: the students acquire baseline already at the end of the first year, and depth - at the end of undergraduate studies (Morze, Buinytska 2014).

Table 2.

Competencies of masters needed to perform research activities

The level of acquisition of ICT competence	Requirements for the outcomes (competences)	Examples of courses that provide the relevant competencies for students
Baseline (1st year undergraduate, tentative)	- Ability to: - to study experience of leading countries in the field of education informatization, the construction of the information society; - to collect, analyze, systematize scientific and technical data, synthesize advanced domestic and foreign experience of the identified issues; - use of means of scientific communication to find the desired information: institutional repositories, digital libraries, e-journals, e-conferences, specialized search engines; - handle source research: organize information, make excerpts, abstracts, - organize and categorize received in the course of research data and evaluate their chance; - use the electronic catalog UDC	- Some themes or modules of courses: "I'm a student", "Introduction to the profession", "Library", "Fundamentals of Information Technology", "Information", etc.; - The task for self-study requires to compile a bibliography on the theme, comparative tables or table summarizing etc. - Term papers and projects from different disciplines
Advanced (bachelor)	Ability to: - Present results at scientific seminars, training and research activities based on the use of ICT; - To participate in e-conferences and webinars. Skills: - Carry out a statistical study	- Some themes or modules of courses: "Information Technology", "Information", etc.; - The task of self-study, for which you need to make a bibliography to the subject, classification scheme of some concepts, presentation,

	of the results of studies using information technology; - Present the results of research in reports, articles, essays, reports, etc.; - use in scientific work charts, diagrams, tables, bar graphs; - Apply business tools of computer graphics to interpret survey results; - To analyze the results of a study to prepare a presentation	plot, make a report, etc.; - Term papers and projects from different disciplines; - Work of Young Scientists; - Educational seminars and conferences, including online, and webinars: upon completion of the training course of studying a discipline, professional conference of the institution, national professional conferences, etc.; - Final bachelor study
Professional (Master)	Ability to: - Use the methods and technologies of training and research; - Choose of materials for research topic and save the results obtained in the network; - Create scientific publications and publish it in an electronic magazine; - Present the results of research of Masters in e-environment of the university; - Present a portfolio of master-graduate	- Some themes or modules of courses: "Modern Technology", "The methodology of scientific research", etc .; - The task of self-study, for which you need to make a bibliography to the topic, write a research paper or thesis, a short description to the topic, create a blog research, etc.; - Term papers and projects from different disciplines; - Work Society of Young scientists and other university departments; - Educational seminars and conferences, including online, and webinars: upon completion of the training course of studying a discipline, professional conference of the institution, national professional conferences, international projects, etc.; - Final master study and its defense

Source: Own work

At the University for monitoring of the formation of a professional level of research activity of students used the e-portfolio of students and for evaluating - the actual defense of master's work.

It is clear that the formation of the ICT competency of masters occurs during the learning process and in extracurricular time and requires both necessary and sufficient conditions.

The necessary conditions for the formation of ICT competence of Masters in Borys Grinchenko Kiev University are (given only conditions relating to topics of this article):

- Creating an e-learning environment of the University (http://kubg.edu.ua/rusursi.html), acquaintance of all participants of the educational process of its structure and resources;

- The use by the teachers certified e-learning courses, social networking and web 2.0 services;

- Creating personalized e-learning environment of master;

- The creation of e-portfolios of master and his analysis;

- Availability of approved corporate standard ICT competence of masters University;

- Availability of approved design requirements for master's works, which includes regulations of corporate standards as well.

The experience of an experiment on creating of the conditions under which masters of the University acquire ICT-competence are the following sufficient conditions:

- Training and exams in the IT Academy (http://kubg.edu.ua/resursi/rusursi/microsoft-it-academy.html): obtaining certificates, including international standard);

- Solving of competency problems (of educational, research and professional nature) as part of the Rector's control and students' independent work (Morze, Kuzminska 2013);

- The introduction of a special course for Masters "Presentation of science activities of masters by means ICT" (http://wiki.kubg.edu.ua/%D0%9D%D0%B0%D0%B2%D1%87%D0%B0%D0%BD%D0%BD%D1%8F_%D0%BC%D0%B0%D0%B3%D1%96%D1%81%D1%82%D1%80%D1%96%D0%B2).

2. THE COURSE "PRESENTATION OF SCIENCE ACTIVITIES OF MASTERS BY MEANS OF ICT" IN THE SYSTEM OF FORMATION OF THE PROFESSIONAL LEVEL OF ICT COMPETENCE OF MASTERS

To determine the information needs of the masters of the University and of constructing a system of information support of scientific research and the formation of ICT competence in terms of electronic information-educational environment of the University was conducted an online survey. 136 masters answered the questions (https://docs.google.com/a/kubg.edu.ua/forms/d/1wNPQpU0bykCxAKBVooy6dWy9etIn0Iuz0BNzYGPQLtY/viewanalytics), which can be grouped into two groups: the use of Internet resources in education and everyday life and determine the status and problems of the use of components of an e-university environment (http://kubg.edu.ua/2012-08-15-10 -06-19.html). According to the survey it was found that most students (96%) use the Internet daily, but 64% of network time spent on self-interest, communication with friends, etc. However, 98% of the masters believed that the transfer of training in an electronic form contributes to the efficiency of the educational process and creates the conditions for job search, training and others. 33% of the students prefer to communicate with teachers via e-mail, 24% - in social networks, but 24% believe the most effective is full-time communication. Approximately the same situation with access to educational materials - 49% of the respondents prefer e-mail. Unfortunately, the issues concerning the use of online resources for research (Figure 1), actualized the issue of specialized training and assistance to masters in the use of institutional repositories, e-libraries, scientometric database for implementation requirements of training of masters at modern level.

The basis conditioning preparation of the Master to the implementation of research activities is manufacturability of process. At the top level of abstraction of any educational technology training are the following phases: diagnostic, design, analytical.

The diagnostic stage shows readiness of masters of 1 year for acquisition the entry-level professional competence and mastery of the master's program, which involves formation of comprehensive, professional and specialized competence, the ability to innovate in the field of IT in education. To identify competencies that meet the basic level of ICT competency of masters the University conducted pilot monitoring (Morze, Buinytska 2014). These competencies that meet the advanced level, can be found at the entrance exam through the portfolio, which includes a description of projects carried out with the use of IT, development of models for solving professional problems, challenges, unusual situations, presentation materials and results of participation in professional conferences, social projects and so on.

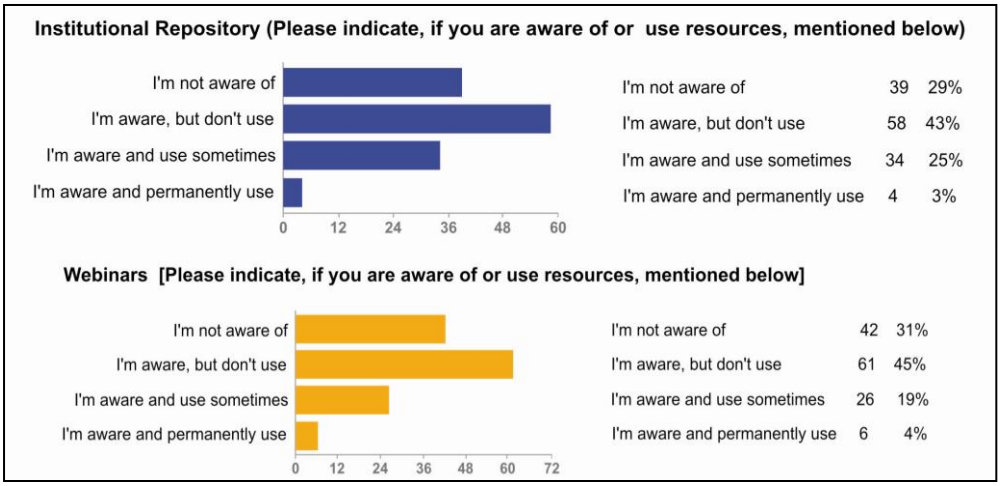

Figure 1. The results of the questionnaire of masters for use of institutional repositories and webinars

Source: Own work

The next stage for acquisition of masters of the professional level of ICT competence in the scientific activity of a preparing of master's thesis is projecting, schematically represented in Table 3. According to the survey of Masters and analysis of training programs was found necessary to develop a special course "Presentation of science activities of masters by means ICT" (Figure 2).

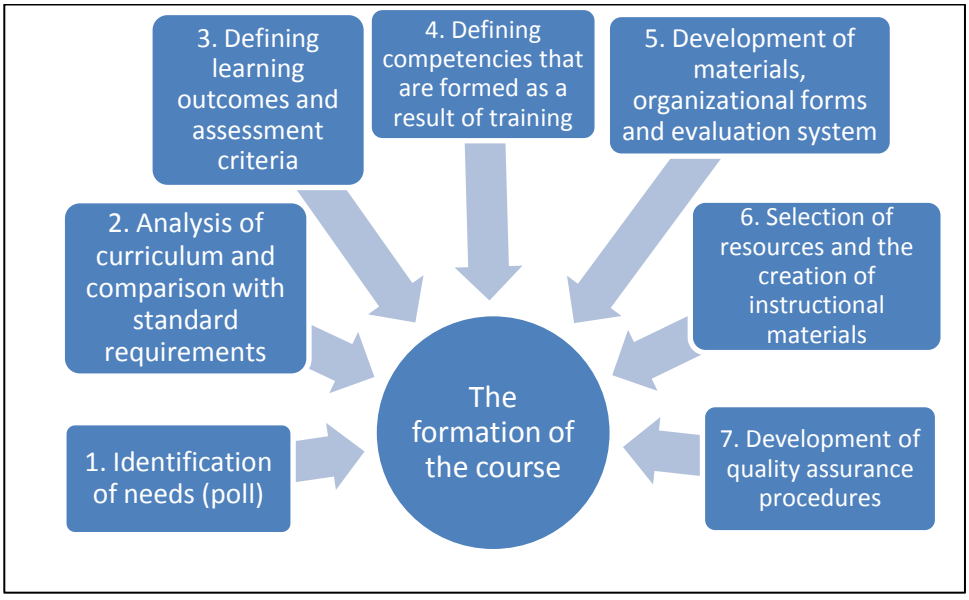

Figure 2. Algorithm of formation of the course "Presentation of science activities of masters by means ICT"

Source: Own work

In developing this course were taken into account the examples of European practice of the formation of learning outcomes (Alisultanova 2010).

Table 3.

Masters activity, required competencies and ICT support

Block number	Activities of masters in conducting research and writing of the master's work	Competencies that are formed as a result of activities	Course topics «Presentation of science activities of masters by means ICT»
1 Definition of the research topic and the necessary tools	Independent study of masters in determination of subject study and mastery of the conceptual apparatus of the domain	Competence with respect of research activities	Theme 1 Working with components of the e-environment of the University Theme 2 Using Google Apps
	Discussion of trends and research stages	General scientific competence	
2 Conducting research	Independent study of masters in conducting research master	Project competence	Theme 3 Selection of materials on research
	Presentation of interim results, discussion group	Communicative competence	Topic 4: Scientific publications of masters
3 Presentation of research results	Presenting research and defense of master's thesis	Professional competences	Topic 5: Placement of masters articles in e-university environment Theme 6 Presentation of scientific research and its results

Source: Own work

The first block is carried out mainly in the form of interviews with masters. In its framework are defined areas of research and emerging individual educational path. Interviews are conducted on graduating department or by individual counseling, online as well. In this block, significant problems and concepts of the subject area of master study can be summarized by manager or responsible person in the form of

online lectures, webinar or forum. In addition, in a joint discussion with the teacher and student determined the plan of study and IT facilities to be used (in some cases pick up or learn the basics) to perform a master study. In the latter in assistance is the course "Presentation of science activities of masters by means ICT", which contains 6 topics and carried out in two sessions: the first appropriate conduct in the first semester for Masters of first year, the second - in the second semester of the first year or the first semester of the second.

The second block (Table. 3) provides for independent work students with the studies of its own research and conducting, selection of information technologies that are used to solve professional tasks in a particular subject area and as a tool for scientific research. Independent work of students is carried out under the guidance of teachers - the heads of master works, which provides counseling and ongoing monitoring. For the efficiency of ICT support and acquisition of competences, masters can use the course material "Presentation of science activities of masters by means ICT" that is located in the university environment, get expert advice of education informatization lab (http://kubg.edu. ua/struktura/pidrozdili/ndl-informatizatsiji-osviti/pro-pidrozdil.html). In this unit significant role played by formation of informational educational environment of the university, including electronic library, tools for access via the Internet to the teaching materials of its education programs, and so on. Note that the course materials "Presenting science master ICT" are posted on the wiki portal of University (http://wiki.kubg.edu.ua/).

In the third block within an individual or collective self-study students spend on graduating department prior protection of master works. Previous protection precedes writing (alone or in collaboration with the supervisor) and the publication of scientific articles of masters (http://masters.kubg.edu.ua/). The purpose of the preliminary protection following the submission of the results of research on the web - to promote professional and specialized competencies specific to the science activities of masters. Protection of master's thesis at the University prior obligatory check for plagiarism and placement work in repositories (http://resbase.kubg.edu.ua/), and the protection is accompanied by a computer presentation and is subject to (optional) discussion on the web.

The final stage of preparation of masters for acquisition of professional level of ICT competence is the analytical phase, which includes external (by expert) and reflective (by students) assess the level of acquisition by alumni the ICT competence and readiness for professional activity with extensive use of IT tools to support it.

Evaluation is carried out on accumulative schemes and should include: current and complete student achievement in the performance and protection of the master's work, estimated the e-graduate portfolio of masters, which contains a description of completed projects, including networking, practice reports, reviews by external experts, certificates results obtained by distance learning, theses conferences etc. Self-achievement of masters, which is manifested in the analysis of the results obtained at the end of the course of study and implementation of master studies

necessary to correct material and enriching professional experience of teachers and researchers. Thus, the results of the final survey of masters (conducted at the end of the course "Presentation of science activities of masters by means ICT"), 96% find it timely and suggested materials and forms of work such that will help better present the results own educational activities (Figure 3). In addition, 71% of the masters noted the benefits of using components of the e-environment to improve the quality of university training; 69% - knowledge and skills for writing research papers and registration of bibliography; 73% - instructions and access to scientific metric database for qualitative analysis of studies of the problem; 56% - use wiki portal of the University to work on the course material and the organization of community of practice.

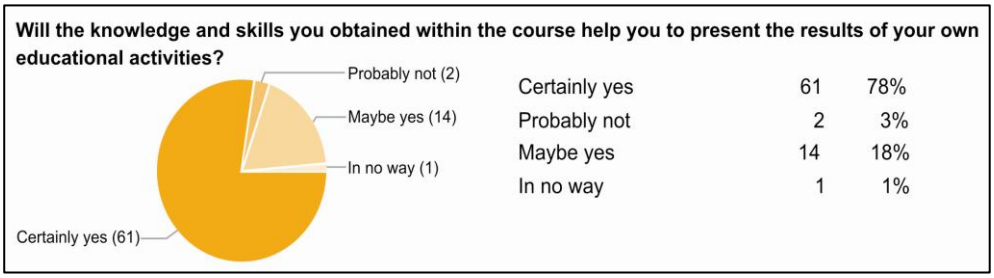

Figure 3. Reflection Learning Courses «Presentation of science activities of masters by means ICT»

Source: Own work

CONCLUSIONS

The analysis of relevance and approaches to the formation of ICT competence of masters of Borys Grinchenko Kiev University, development models and technologies of its implementation, as well as conducting the corresponding experiment leads to formulate the following conclusions and generalizations:

1. To provide quality modern education it is advisable to combine the use of QMS ISO standards and European standards and recommendations ENQA. To adapt ENQA standards for specific university needs to develop and adopt regulations and standards.

2. Modernization of the structure, content and organization of education on the basis of competence-based approach, the development of research and innovation in education, improving the quality of education on the basis of innovation; informatization of education, improvement of library and information resource providing education and science are the priority areas of Education of Ukraine, because the development of standard ICT competence of masters University defines specific Results of training.

3. To implement an effective training system for masters is necessary to analyze requirements for training masters (standard ICT competence) to determine the information needs of masters (questionnaires, surveys) to develop criteria for evaluation of specific activities and create e-resources to ensure compliance.

4. Use of ICT in the implementation of research activities (such as conducting research by the master) requires additional training masters. One way is to develop a special course and conduct of its several sessions according to the stages of the master's study.

5. Creating and using experimental course "Presentation of science activities of masters by means ICT" has proven its effectiveness in the preparation and defense of master study, as evidenced by student reflection and increasing quality of preparation their works.

Further studies are required to supplement the course "Presentation of science activities of masters by means ICT" by additional modules that can be used depending on the needs of students and the profession. These include, for example, ICT in support of conducting of experimental master studies (such instruments vary according to specialty and specialization masters) and the use of e-portfolio of for employment and establishment of contacts, including scientific ones.

Replication course "Presentation of science activities of masters by means ICT" - training in NUBiP Ukraine (http://agrowiki.nubip.edu.ua/), provides grounds for the spread of the experiment to other universities through the definition of information needs and training requests ICT- support of science activities of master and creation an open-distance course (MOOC).

ACKNOWLEDGMENTS

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MOBILE TECHNOLOGIES – KIND OF ONLINE TECHNOLOGIES USED IN REAL EDUCATION

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Abstract: *At first sight, the world of online technologies may seem a bit confusing. This paper introduces the iTunes U platform as a mobile learning tool in the context of broadly conceived online technologies that can be used in real education. Moreover, the paper deals with the concept of a course in the iTunes U environment and introduces particular models of the iTunes U use.*

Keywords: mobile learning, iTunes U, iPad, mobile classroom

INTRODUCTION

Today's society can be characterized by a rapid development of all forms of technologies – from the continuous development of hardware to the enormous number of traditional offline software applications to the boom of free Internet services. Nowadays, institutions of education cannot rely on only one system used for the management of studies. In the majority of cases, the education process should be flexible and should contain the latest trends and devices (Zounek 2012].

If we limit ourselves only to the latest online applications that work on the principle of the Web 2.0 system (the traditional LMS e-learning environment works on the same principle), we can characterize – from the pedagogical standpoint – the so called Integrative Learning Technologies (ILT). The ILT represent a wide spectrum of web tools, systems and mobile technologies, which support the integration of technologies and pedagogical approaches in all phases of the education process. Within the scope of this concept, we think of technologies as of an integral part of the education process, not only as an "accessory" of teaching or learning. The ILT concept helps make online technologies more transparent and at the same time provides a general framework for considerations and the use of these technologies in education. The ILT contains a wide variety of different tools and systems, which differ in the purpose, functions, difficulties, and the possibility of their implementation into education.

We will try to simplify this wide area and present the functional pedagogical typology of the online technologies. This ICT-based typology consists of the following chapters:

- Online tools;
- Online systems for the support of education;
- Means carrying educational content;
- Mobile technologies tools.

We will focus in detail on the last of the abovementioned chapters – mobile technologies.

1. MOBILE TECHNOLOGIES TOOLS

Nowadays, this topic is known as mobile learning or m-learning, which can be described as the education process being supported by a mobile device where the learner is not bound to a particular place. If we take into account that these devices can be connected to the Internet through wireless connections or mobile operators, or be connected to one another, we are facing technologies that offer interesting solutions for both students and teachers.

Mobile learning is an example of the use of modern technologies, which extend the possibilities of other technologies in education. Mobile learning is not an alternative to e-learning (in all its forms) as it completes it by integrating mobile devices. The education process itself uses many devices, which are always related to the aim and content of subject matter and to the capabilities of the participants of the education process.(Zounek 2012)

As far as m-learning is concerned, tablets, which are a fine example of being mobile and functional at the same time, are becoming more and more popular. It is a small device, which is suitable for being used both inside and outside of classic classrooms. Tablets represent a natural and comfortable way for students to interconnect their work with both digital and printed sources, working in a group, and individual task solving – all this can be done with no special restrictions. The advantages of the practical use and incorporation of a particular m-learning tool – the iTunes U platform – are introduced in the following part of the paper.

2. iTunes U MODELS OF USE

The iTunes U is a platform designed by Apple Inc. and intended for the use at schools. It contains tools for teachers, students and schools and it is fully adapted to the m-learning model. Even though the name iTunes U is derived from the word “university”, practice proves that the usage area of the tool is much wider. As far as

teachers and students are concerned, there are now several different models of the iTunes U use.

3. iTunes U FEATURES

The entire iTunes U tool consists of two main parts – a web application intended exclusively for the creation of courses, and an application for the iPad tablet, which can be used for the studying itself and, as for the teacher's account, for managing of courses. The application also has a version for the iPhone cell phone and the iPod touch device respectively, which cannot create or modify courses and is intended solely for studying. The tool can be used only when one has a valid Apple ID, which is an Apple inc. free registration account. This account is used for identification when logging in to individual courses and for synchronization of notes.

The entire tool is free and offers teachers as much as 20 GB of space for storing their materials in 12 courses. The number of students in one course is restricted to 50. When a school, which is entered in the Register of Schools, registers to the system it acquires unlimited space for storing materials, unlimited number of students in courses, unlimited number of courses for each teacher and the possibility to publish public courses. (Valstad 2010).

4. iTunes U COURSE DESCRIPTION

The iTunes U enables the creation of courses, which can be saved in a device with the iOS operating system – the most common device being the iPad. The course is designed as a study guide with partial tasks for a student. The course can also contain inserted materials and links to study sources such as:

- Text documents (Microsoft Office, iWorks, PDF);
- Electronic books (ePub, iBooks);
- Audio recordings;
- Video recordings;
- Links to applications for the iPad;
- Links to websites.

A Student downloads the course to their iPad, i.e. an outline according to which they work. In the outline they can tick the already solved tasks. Students can also download all the materials to their iPads – therefore, there is no need to be connected to the Internet when one wants to study. The course on a student's iPad can also be used as a notepad since a student can write down notes to the course. The notes are always related to the part of the course that a student is solving at the moment. In the case of audio and video recordings, the notes are saved with a

timestamp. Therefore, a student can watch the recording of a lecture and add notes to the problematic parts. When watching the recording again, a student can choose the part of it they want to watch.

5. PUBLIC AND PRIVATE COURSES

Basic distinction of course types is whether they are public or not. The courses are divided into public and private with the main difference being the possibility of managing the signed-up students and the possibility of discussion.

Only a registered school can create public courses; such courses are published in the iTunes U online catalog, which is available from the iTunes application on the iPad. Such courses are available to each student and their author cannot see the list of signed-up students, they can see only the number of students. The administrator of the school iTunes U site is informed about statistics based on the Apple ID (nationality, type of device, frequency of downloading…). Such courses are often used as a support of distance studies, for an informal education of the MOOC type, or as a school presentation.

As far as the private courses are concerned, a teacher has a tool for managing the signed-up students at their disposal, which means that they can see names and the Apple ID of the students. Therefore, a teacher can authorize course registrations, block the access for particular Apple IDs, and can also see basic data about a student's approach to the course. The second tool intended only for the private courses is discussion, which is possible between all the signed-up students and a teacher, who can also moderate it.

By default, all the created courses are private. If a teacher (the author of the course) wants to make a course public, they must ask the administrator of the school iTunes U account to do it. By moving a private course to the catalog, it becomes a public course and cannot be made private again. With a course becoming public the list of signed-up students is deleted.

6. iTunes MODELS OF USE

While the main function of the iTunes U is the creation of study plans for students, practice proves that it can also be used in other ways. It depends mainly on the availability of end devices such as the iPad, the iPhone, and the iPad Touch. Nowadays, there are three models of use of devices with the iOS operating system. These are:

- One device in a classroom operated by a teacher;
- Shared mobile classroom;
- The 1:1 concept – each student has their own device.

In each of the models the iTunes platform can be used in a different and specific way.

7. ONE DEVICE IN CLASSROOM

The statistics of the Czech School Inspectorate show that the use of ICT in education by a teacher is prevailing. (CSI 2012)

Part of the reason most certainly is school amenities. We can assume that in the model of frontal teaching the mobile devices will partly replace the commonly used PC workplace. In such a case, an iTunes U course can be used as a tool that makes the classic preparation for a class easier. A teacher can create a class plan (in the form of partial tasks) and check that they are solved during the class.

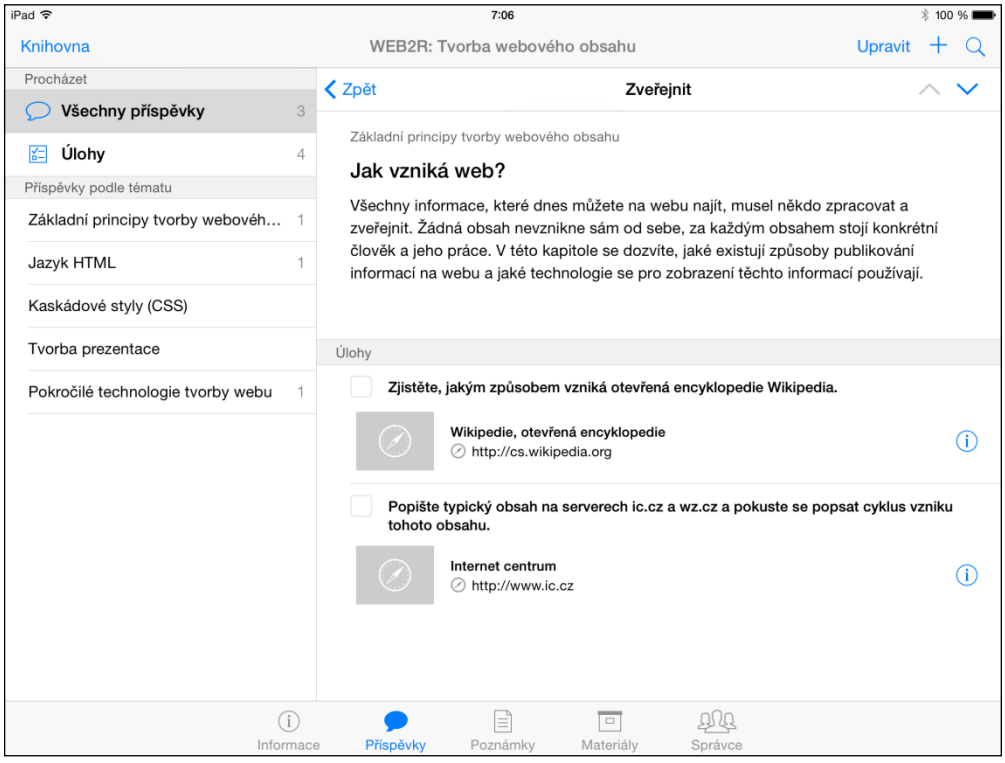

Figure 1. Study plan of a class with partial tasks

Fig. 1 shows a course which was created as a class plan. The right panel contains individual topics while the left panel contains a teaching text and tasks that a teacher assigns to students. Thanks to a library of materials, a teacher has all the prepared materials at their disposal (without having to be connected to the Internet). Common formats (presentations, text, multimedia) can be presented directly from the iTunes U application. However, thanks to the possibility of referring to other applications, any other material can be used.

A timestamp can be used for media formats (audio and video). Therefore, if a teacher uses a long video recording, they can skip to a particular part of the recording.

As many as five teachers can collaborate on the iTunes U courses. Each of the teachers can contribute and insert materials. A course with all the signed-up students can also be handed over to another teacher.

8. SHARED CLASSROOM MODEL

Even if the model of the shared use of the iPad is the least suitable (as far as the iOS operating system is concerned), it is widely used at schools. It has to do mainly with the price and also with the initial understanding of replacing the classic computer with a tablet. Many schools use this model as a kind of a test of the appropriateness of the tablet use at school. (BÖHM 2014)

The iTunes U has its place in this model. The course can be used for instructing students about a particular working process, e.g. for laboratory work. The following information can be inserted into a course: study materials from previous classes, which are used for the revision of curriculum; a list of tools needed for conducting an experiment; video instruction for connection; sample protocol.

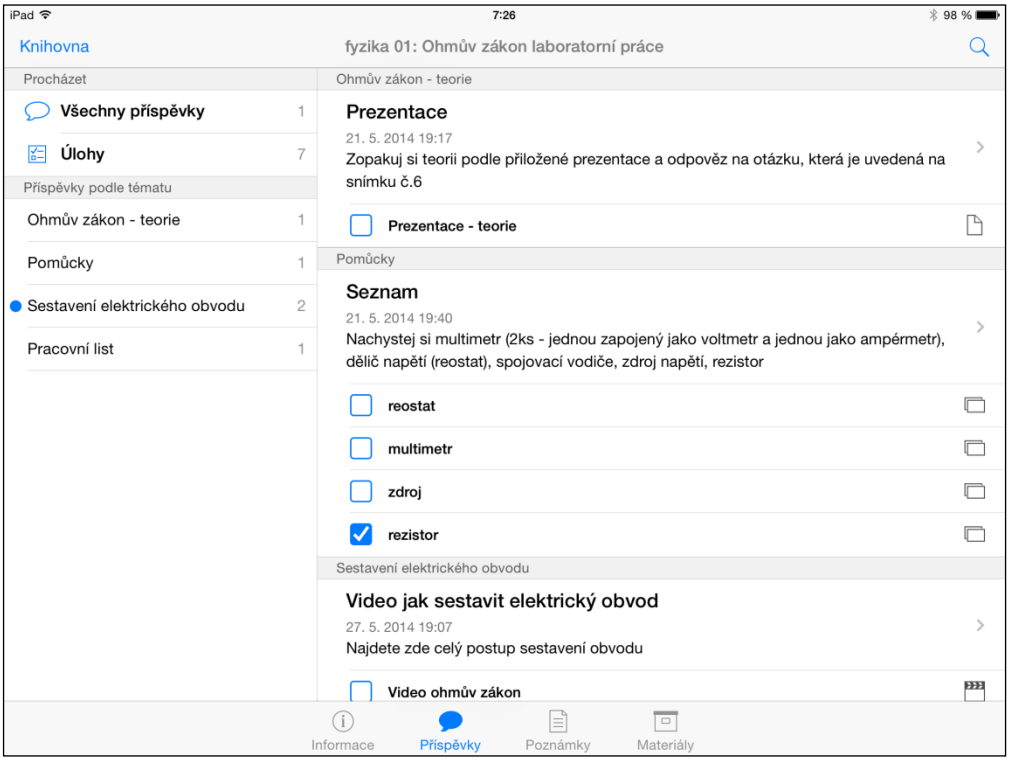

Figure 2. iTunes course as a laboratory work guide

Each student or a group of students can progress at their own pace and record their technique directly to the iPad. As far as the preparation for a laboratory experiment is concerned, they simply mark what they have already prepared and what they have not. For each tool, a course facilitates the insertion of its photograph into it.

The main advantage of such solution is the possibility of the immediate update of instructions. When any of the working tools in a course needs to be changed, the change needs to be made only in the teacher interface and all students' iPads are automatically updated. Thanks to an inbuilt camera, a teacher can take a picture of some of the works and share them in a course.

Another example of the use is the replacement of classic study materials. Switching over from unified curriculum to the individual school education programs has led to significant changes in the time schedule of teaching. As a result, sometimes unified textbooks cannot be used and a teacher must use materials from different sources. The iTunes enables the creation of a set of study materials for a particular class and its update on a regular basis.

9. MODEL 1:1

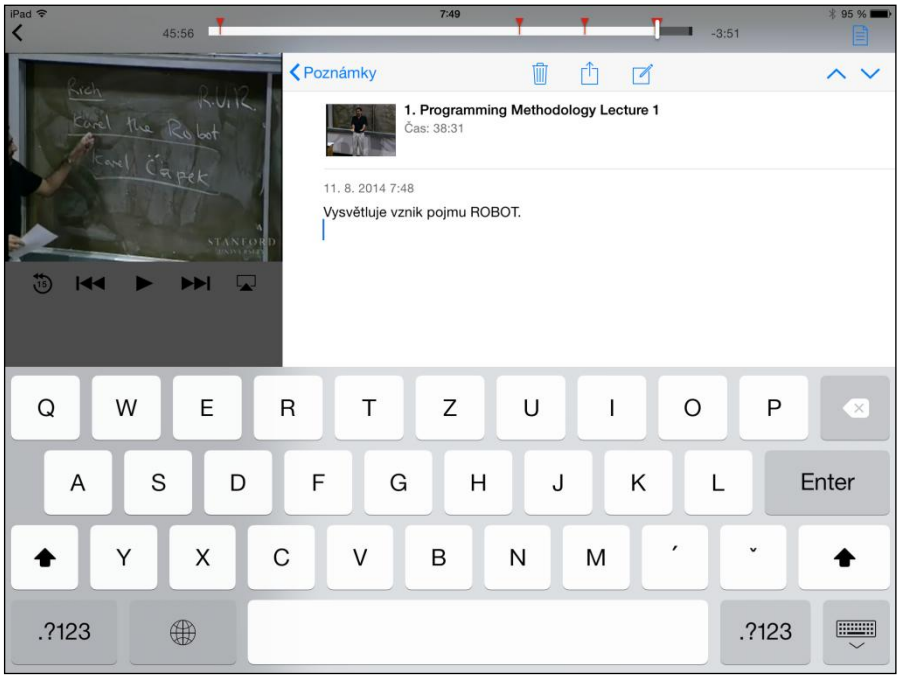

Figure 3. Inserting a note to the recording of a lecture

The 1:1 model expects the iPad to be used as each student's personal device. The iOS is designed as a one-user operating system, which is why, as far as the setting of

all instruments is concerned, it is optimal to use it that way. This means that the iTunes U is used in a way it was designed to be used. (BÖHM 2014)

The most important part is the possibility to insert notes for the individual study materials. The notes are structured according to the time of creation and to which material they belong. As for books, the notes are marked with a particular place in a book. As for audio and video recordings, the notes are marked with a timestamp and can be inserted when the recordings are being played.

The 1:1 model also enables the use of a tool for discussion, which is very important for the m-learning model. Teaching is not limited to a particular time slot as a student can study at any time (including their interaction with both classmates and a teacher).

CONCLUSION

As far as the use at schools is concerned, the iTunes U offers a comprehensive environment. Particular ways of use depend on the way mobile devices are used. It is evident that a teacher can adapt the tool according to their own requirements. Moreover, its use is not limited in any significant way.

As far as a school is concerned, the tool is beneficial mainly because of the cost savings for the system administration and also because of the possibility of individualization of study materials. Thanks to the tool a teacher can create their own digital portfolio and update it immediately.

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MLEARNING AND CHEMISTRY APPS ON IPAD

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Abstract: *iPad is a very popular and useful tool in chemistry education as it makes teaching and learning more efficient. Students may use iPad and relevant apps at any stage of the learning process. Mobile technology progress creates new mLearning opportunities. The Apple iPad offers access to effective and efficient pedagogy in an easy and intuitive way. This document presents selected examples of free apps available to students and teachers.*

Keywords: mLearning, iPad, applications, chemistry education, cognitive tools

INTRODUCTION

Technological progress leads to transformation of remote learning methods. Introduction of new mobile learning tools provides teachers with new knowledge sharing options and allows them to create new types of materials, tasks, tests or films. Sharples defines mobile learning as: "the processes of coming to know through conversations across multiple contexts amongst people and personal interactive technologies". The m-learning system expands the communication space between the student and the teacher (Oldfield, Herrington 2012) .

M-learning education avails of state-of-the-art developments of mobile technology. School and university education benefit from the use of multi-media capable cellular phones, iPods and iPhones, PDAs, and portable netbook computers. The mobile devices offer five distinct affordances for education:

- portability (mobile devices offer portability and change the pattern of learning or work activity)
- affordable and ubiquitous access (mobile devices put web access and 'high-spec' functionality in the hands of more users than any other digital technology)

- situated, ‘just-in-time’ learning opportunities (we can engage and process information whenever and wherever we want, mobile devices can decentralise our learning experiences interactive tools)
- connection and convergence (mobile devices connect us to other people, other devices, other networks, and other technologies)
- individualised and personalised experiences (mobile devices offer individuality) (Melhuish, Falloon 2010).

Huge potential of these tools are changing completely the learning and the teaching methods however, it favours the constructivist approach to learning as well as flexible and adaptive approach to educating. The introduction of iPads in 2010 triggered enormous changes in the organisation of the didactic process (Melhuish, K., Falloon 2010).

The launch of state-of-the-art iPad technology was even described by Murphy as the launch of ‘post-PC devices’ or PPDs. The up-to-date analyses of iPad use in education have provided optimistic and positive feedback from students (Manuguerra, Petocz 2011).

Jonassen and Reeves described cognitive tools as “technologies, tangible or intangible, that enhance the cognitive powers of human beings during thinking, problem-solving, and learning”. Therefore, computers, smartphones, mobile tablets and applications which support the education, may ~~be~~ also be used as cognitive tools. When availing of mobile tools, students get access to new knowledge. Moreover, they may also interpret information, organise, analyse and update it and present it to others. Jonassen proposes that mobile devices as “mindtools” have the capability to engage learners in critical, higher-order thinking about content because:

1. The learners are the designers
2. The focus is on knowledge construction, not reproduction
3. Learning is in partnership with technology
4. They are unintelligent tools, relying on the learner to provide the intelligence
5. They distribute the cognitive processing
6. They are cost and effort beneficial. (Oldfield, Herrington 2012)

According to Rockman, iPads are common educational tools as they may serve ‘as a catalyst that could facilitate movement towards constructivist practices, where teachers act primarily as coaches’ (Melhuish, Falloon 2010)

The iPad has also become an increasingly popular teaching tool providing access to numerous applications which may be applied for chemistry teaching at various educational levels (Libman, Huang 2013, Williams, Pence 2011) .

Apple’s iPad is considered a new type of mobile platform which offers full functionality and connection with a laptop as well as smartphone mobility

(Melhuish, Falloon 2010). A student and a teacher may use free iPad apps available via iTunes at Apple website. Therefore, the purpose of this article is to present and briefly describe selected free Apple apps which may be used when teaching chemistry and nature at various levels of education.

1.1 Chemistry teaching apps

The applications presented in this article may be divided into several groups depending on the contents:

- molecule builder or viewer
- chemical reactions
- periodic table and atomic theory
- reference material
- calculators
- chemistry videos and experiments
- funny stories
- useful apps for teacher
- others (apps available on every tool, e.g. iBooks, iPhoto, iTunesU)

All the described apps are free of charge and available at www.apple.com (Table 1).

The student and the teacher may independently download a freely selected app using iTunes application available at all Apple mobile devices.

Table 1.

Examples of free apps

App type	App name
Molecule builder or viewer	• Atom-Builder • Building Atoms, Ions, and Isotopes HD Lite • Mobile HyperChem
Chemical reactions	• Chemical Reaction Lite • Glow Fizz Chemistry Kit
Periodic table and atomic theory	• EMD PTE • Periodic Table of the Elements • The Periodic Table HD

Reference material	• Green solvents • LabAssistant • Organic Chemistry Essentials • Wolfram Alpha
Calculators	• Chemistry Formula Practice Lite • Gas Laws HD • LabCal
Chemistry videos and experiments	• Khan Academy: Chemistry 1 • Khan Academy: Chemistry 2 • VideoScience • Science360 for iPad
Funny stories	• Oresome Elements • Painless Chemistry Challenge • Mahjong Chem • Nova elements
Useful apps for teacher Others	• TeacherPal • iTunesU • iBooks • iPhoto

Source: Own work

1.2. Brief description of the apps

1.2.1 Molecule builder or viewer

a) Atom-Builder:

- an game designed to teach students the skills they need to count protons, neutrons, and electrons in an atom
- a teacher can use it in your course as homework or a worksheet for atomic structure and particle counting

b) Building Atoms, Ions, and Isotopes HD Lite**:**

- a student can build atoms, ions, and isotopes by selecting appropriate numbers of protons, neutrons, and electrons
- includes atomic theory information and the interactive periodic table
- Lite version only includes Build an Atom and Atomic Theory History Features

c) Mobile HyperChem**:**

- basic 3D molecule creator allows students to create, display, and manipulate molecular structures.
- student can get simple data (bond length, angle) by selecting atoms
- no export function in free version so just take a photo of screen

1.2.2 Chemical reactions

a) Chemical Reaction Lite:

- fast paced game play with the avator (Dr. Smith)
- a student has to solve several exciting puzzles and stop these bubbling chemicals from getting out of control

b) Glow Fizz Chemistry Kit:

- the virtual Chemistry Laboratory (6 different experiments, 3 different categories, 4 different periodic elements)
- explanatory videos, characters and animations

1.2.3 Periodic table and atomic theory

a) EMD PTE:

- detailed information, state-of-the-art functions and an appealing presentation
- student has the opportunity to learn more about the chemical elements - from classification to element features to their history of discovery
- the structured and concise arrangement of groups and periods and numerous selection options provide quick access to needed information

b) Periodic Table of the Elements:

- a student can select a chemical attribute and have the entire chart colour coded to plainly show how the different elements vary with regard to the selected trait (Atomic Number, Chemical Family, Electronegativity, Radioactivity, Melting Point, Boiling Point, State)
- when State is selected a student can change the temperature using a slider control to see the states of the elements at the temperature you select

c) The Periodic Table HD:

- includes the name, density, electronic configuration, atomic number, melting point
- useful graphic

1.2.4 Reference material

a) Green solvents

- a collection of chemical solvents, with data regarding their "greenness": safety, health and environmental effects

b) LabAssistant:

- chemical compatibility guide
- a student can check what materials will work with the chemicals using or planning to use

c) Organic Chemistry Essentials:

- many topics such as reagents, synthetic strategy, and organic reactions
- has little-known trick reactions, clues to organic reactions

d) Wolfram Alpha:

- a reference tool for many topics (Elements, Compounds, Ions, Solutions, Reactions, Chemical Thermodynamics)
- typing in names of elements and compounds will yield lots of useful info

1.2.5 Calculators

a) Chemistry Formula Practice Lite:

- stimulates students' mastery of the fundamental skill of naming compounds and writing formulas
- the practice categories include ionic and molecular compounds, acids, bases, polyatomic ions, hydrocarbons, and organic functional groups

b) Gas Laws HD:

- a student can study the various relationships that exist between pressure, volume, temperature and number of particles of a gas
- plot a graph of volume (V) versus temperature (T), graph pressure (P) versus volume (V)

c) LabCal:

- a student can calculate the molarity, to convert gram and mole and to compute dilutions of stock solutions
- slider-controlled SI-prefixes, automatic adjustment of values to SI-prefixes

1.2.6 Chemistry videos and experiments

a) Khan Academy: Chemistry 1 and Khan Academy: Chemistry 2:

- a student can watch the video lessons from the Khan Academy
- the videos work through numerous sets of problems providing the most comprehensive set of teaching videos available

c) VideoScience:

- the short videos demonstrate inexpensive and easy to recreate experiments
- the experiments are designed to inspire and excite students

d) Science360 for iPad:

- access to engaging science and engineering images and video from around the globe and a news feed featuring breaking news from The National Science Foundation (NSF)-funded institutions
- the images and videos to experience, with new content added weekly

1.2.7 Funny stories

a) Oresome Elements:

- an interactive game that makes learning about the periodic table, elements and some of their properties and uses fun
- the game is aimed at secondary school students to learn about elements and the periodic table

b) Painless Chemistry Challenge:

- contains three quizzes to test student's knowledge and three games to test the skills
- a wide range of subjects as they are taught on middle school and high school levels.

c) Mahjong Chem:

- a game to practice the student's knowledge
- basic chemistry (the names to symbols, polyatomic ions, assigning oxidation numbers, electronic configurations, metric prefixes)

d) Nova elements:

- an interactive periodic table with short bio lets students build each atom
- the current names and classifications of elements

1.2.8 Useful apps for teacher

a) TeacherPal:

- a teacher personal planner
- useful for classroom organization, behavioural monitoring, and grading

1.2.9 Others

a) iTunesU:

- the free courses from leading universities and other schools
- the teachers can create and update their courses
- the teachers and students can keep up with the conversation
- access course materials, including audio, videos, books, documents and presentations, apps, and the textbooks

b) iBooks:

- the teachers and students can download and read books
- the user can create a book with iBookAuthor (free, Mac only) and save in the latest iBooks format to make the most of this version (more interactive, embed questions, keynotes, widgets)

c) iPhoto:

- a photo editor taken with iPad (photostream)

CONCLUSIONS

Availability of chemistry apps for iPads and other mobile tools allows teachers to design interesting classes stimulating students' potential for creative and analytical thinking, expanding their knowledge and developing the ability to use new communication technologies. Helpful chemistry apps may alter student's approach to natural science and increase learning efficiency. Fast pace evolution of chemistry apps requires continuous extension of interactive space between the student and the teacher where everyone can become the designer of communication and flow of knowledge.

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USING E-LEARNING IN IMPROVING THE LEVEL OF STUDENTS' PROFESSIONAL COMPETENCES

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Abstract: *The article is devoted to the current problem of improving the level of students' professional competences. The main attention is paid to the preparation of teachers of Informatics and Mathematics. The article presents the list of students' competences that could be improved at the studying process of Numerical Analysis and ways of implementation e-learning for obtaining this educational goal.The paper describes the main components of e-learning course elaborated on the base of CLMS Moodle and corresponding learning activity of students: using learning materials elaborated on the base of Computer Algebra System Maple; filling glossaries of the course; problem solving; assessment of the level of competences, using tests.*

Keywords: e-learning, professional competences, Numerical Analysis, teachers of Informatics and Mathematics.

INTRODUCTION

One of the current problem in the domain of education is forming professional competences of students. Graduates from universities should be ready to work effectively in rapidly changeable circumstances, to continue their learning after finishing university. So, it is quite important to teach them how to solve problems in the subject and professional area, to learn independently, to perform a critical analysis of the materials and web resources, to carry out research and to work in groups.

Comparing the modern generation of students with the previous one we can admit ~~such~~ their characteristics such as dealing with different types of modern gadgets, using web-searching and web-recourses for handling the problems, solving tasks on the base of implementing new technologies etc. (Howe, Strauss 2007). They prefer to receive feedback quickly, work in groups and communicate with others (Tapscott 1998). It means that today it is quite important to provide students with tools that on the one hand could match their preferences and on the other hand be an

efficient instrument for obtaining desirable learning outcomes. In this case, developing e-learning environment for students that provide easy access to learning materials, support communication between peers, using different types of gadgets as well at the class as outside, could be a good solution of this problem.

The main purpose of this article is to discuss the ways of using e-learning in improving student professional competences on the base of the experience in the implementation of e-learning in teaching and learning Numerical Analysis at the National Pedagogical Dragomanov University. The article describes different types of student's learning activities with the use of an e-learning course. The results of observations have been obtained in the period of pedagogical experiment and teaching Numerical Analysis for future teachers of Informatics and Mathematics.

In chapter 1 we clarify the meaning of the definitions "competence" and "competency". We also present the list of professional competences of future teachers of Informatics and Mathematics that could be improved in the studying process of Numerical Analysis.

In chapter 2 we represent the main components of e-learning course elaborated for supporting the teaching and learning of Numerical Analysis and characterize the corresponding students' activity: using learning material (2.1), filling glossaries of course (2.2), problem solving (2.3), assessment of the level of competences, using tests (2.4).

1. PROFESSIONAL COMPETENCIES OF FUTURE TEACHERS OF INFORMATICS AND MATHEMATICS

Our review of the publications devoted to the term "competence" (particularly, Wagenaar 2014, OECD 2005) reveals many different definitions. However, in most of them researchers pointed out that the definition of "competence" associated with one's ability and willingness to act in different situations, to implement experience, to solve problems, to analyze the process of own actions.

At the same time the term "competency" is also used in the publications. In our research we distinguished these definitions and used the following ones.

Competence is a complex of individual capacities that include knowledge, skills, abilities, attitudes and experience of implementing them in diverse situations. To have a competency means to be able to act in a whole variety of situations, especially practical ones, to analyze the process and results of this activity.

Competency is the terms of reference of a person concerning the implementation of some type of activity.

On the base of the analysis of the modern educational goals, subject and object of Numerical Analysis, we created the list of professional competences of future

teachers of Informatics and Mathematics that they could improve while studying this field at the university.

General-professional competences:

- using ICT for solving tasks;
- working in groups and independently;
- project work;
- using e-learning for improving the level of competences;
- self-direction and implementation of own learning style;
- making reflection of own learning activity;
- critical thinking etc.

Informatics competences:

- constructing and investigating the information models of practical problems;
- distinguishing well-conditioned and ill-conditioned problems;
- dealing with situation of loss of significance, performing computations on the computer;
- carrying out the computer experiments, using the ICT (particularly, Computer Algebra Systems (CAS));
- choosing/elaborating the effective numerical solution methods and numerical stable algorithms for solving given problems;
- analyzing the complexity of an numerical algorithms;
- understanding the restrictions of using ICT in problem solving etc.

Further on, students will be able to implement these competences in learning other disciplines and their professional life.

For developing students' professional competences in the studying process of Numerical Analysis we apply investigation approach in education, implement system of practical and competence problems, systematically use ICT (particularly, CAS, pedagogical program package GRAN (Zhaldak, Goroshko, Vinnychenko, Tsybko 2012) and spreadsheets) and an elaborated e-learning course. In next chapters we focus on the main components of this course and corresponding learning activity of students.

2. E-LEARNING COURSE OF NUMERICAL ANALYSIS

E-learning course for supporting teaching and learning Numerical Analysis (www.moodle.ii.npu.edu.ua) was developed on the base of Content Learning Management System Moodle (William Rice 2006).

It consists of the following components:

I. general information about the course (the program of the course, list of the topics, publications and links to web-resources, criteria and forms of assessment, glossary of the course, list of projects' topics);

II. modules with learning and methodological materials (guidelines of the modules, glossary of the modules, Maple worksheets, problems for solving, list of questions, tests for self-assessment, assessment tests);

III. final assessment (list of questions, test for self-assessment, assessment test).

Using e-learning course, students have opportunities:

- to get knowledge about the main conceptions of Numerical Analysis and numerical solution methods (using elaborated learning materials);
- to fill the glossaries of the course;
- to work on the improving their competences, solving the problems and the system of the tasks;
- to take part in the projects;
- to assess their competences in Numerical Analysis, using the developed tests.

Further, we present some results of observations of different types of students' activity with using e-learning course of Numerical Analysis.

2.1. Using learning materials elaborated on the base of Computer Algebra System

For familiarizing students with numerical solution methods we elaborated learning materials on the base of CAS Maple (Frank 2002). They include the basic concepts and notations of Numerical Analysis and examples of applying of the numerical methods of solving different types of the mathematical problems (Figure 1).

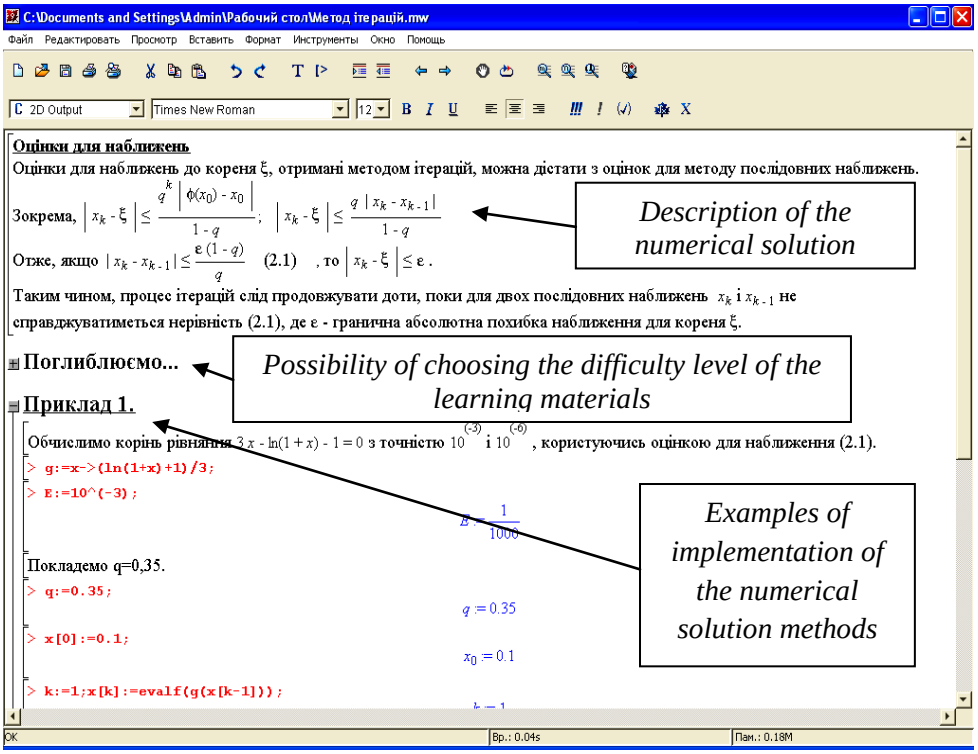


Figure 1. Example of learning materials (Maple worksheet)

The developed worksheets consist of:

- the text blocks with the definitions, theorems and descriptions of the numerical solution methods;
- the execution blocks: input with the commands of CAS for implementing numerical solution algorithms and corresponding outputs;
- the graphical blocks for better explanation of the sense of applied methods.

Using learning materials, students deal with models of numerical solution methods developed on the worksheets of CAS Maple. In this way, learners could analyze all steps of numerical solution method without necessity to write a code of the program. They could also easily manipulate with the elaborated model by changing values of the parameters and analyze results. So, they focus on the sense of numerical solution methods; investigate meaning of the parameters, restrictions of methods' implementation etc.

Practice has shown that such an approach is very useful at the beginning of teaching and learning Numerical Analysis, when students just start to get knowledge about numerical methods. Next, this activity also allows students for deep understanding of other numerical solution methods, using CAS, as well as for developing their own problem solving ideas.

Moreover, students' activity with Maple's worksheets looks like numerical experimentation performed on a computer that is the component of Informatics competences of future teachers of Informatics and Mathematics. Students also could also use Maple programming language for realization numerical solution algorithms, to improve their competences in programming.

2.2. Filling glossaries of e-learning course

Results from the studies have shown that filling of the glossaries of e-learning course is very effective for understanding the main conceptions of Numerical Analysis. During this activity, students determine the main characteristics of the conceptions, features of the objects, offer definitions of conceptions of Numerical Analysis, make critical analysis of the definitions submitted by other students, write comments to peer responses and assess their activity. The teacher also comments on the definitions submitted by the students.

In our practice we often detected of the appearance of some discussion concerning definitions proposed by students. Some students have difficulties indentifying the main features of the conceptions and proposed incorrect definitions. Here are the extracts from the glossary of the e-learning course that concerns the term "model".

Student 1: "Model – is the small copy of an original that is created in order to investigate the original features."

Student 2: "I don't agree. Not mandatory that it should be "small copy". For example, model of an atom is bigger than original."

Student 3: "Model resembles the original. It has the same features as the original does, but it is simpler than the original."

Student 4: "Student 3, what do you mean "the same features"? I guess, that ~~model~~ mandatory model should have the features of the original that are important for gaining the goals of the research or performed activity. Other features are optional. For example, models of a man could be a skeleton as well as a mannequin. The first one is used for investigating the human physiology and the second one – for modeling the clothes."

Student 2: "Yes, I agree with Student 4."

Student 1: "Then, model - is a copy of an original that has the features of original which are important for gaining the research goal".

Teacher: "How do you think models can exist only in human mind?"

Filling of the glossaries of the e-learning course allows students to generalize their knowledge. For example, students submit definition of "approximation of the functions" to glossary and then give information about different types of function approximation. They also create mind maps that as well describe the meaning of the main conceptions as ties between them.

As practice has shown, students benefit from glossaries during all process of learning of Numerical Analysis, particularly to remind the definitions that were forgotten.

2.3. Problem solving

Using tools of the e-learning course (forum, tools for sending messages), students communicate with peers and the teacher, discuss their difficulties and ways of the problem solving, obtain and offer help to each other. This activity increase students' motivation to learn Numerical Analysis.

For example, the teacher proposes the following problem to students.

Solving the square equation $x^2 - 190x + 1 = 0$, using quadratic formulas $x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ and carrying out the computations with 5 significant digits, we obtain the following value of roots: $x_1 = 189.99$ and $x_2 = 95 - 8\sqrt{141} = 0.008$. But the true values of results are 189.994736… and 0.00526330… . So, relative error of the second root is almost 60%. What is the reason of obtaining such a big relative error of the second root? How to avoid this situation?

Students could discuss this problem, using Moodle tools for communication, and propose their variants of obtaining results with higher precision. Collaboration work fosters the finding the right answer: the reason of this situation is loss of significance when we use quadratic formulas and carry out computations with 5 significant digits (in this case there is a small difference between numbers 95 and $8\sqrt{141} = 94.992$).

Students propose the following way of carrying out computations with 5 significant places that leads to better results:

1) $x_2 = 95 - 8\sqrt{141} = \frac{\left(95 - 8\sqrt{141}\right)\left(95 + 8\sqrt{141}\right)}{95 + 8\sqrt{141}} = \frac{1}{95 + 8\sqrt{141}} = 0.0052634$ or

2) determinate the first root, using formula $x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$ and the second $x_2 = \frac{1}{x_1} = 0.052634$ (on the base of Vieta's theorem). The value of the second root involves less relative error 0.001% and has 4 significant digits.

On the base of this example students understand the meaning of the term "numerical stability" and make a conclusion about necessity to control the numbers of significant digits entered in the computer memory according to the situation (Goldberg 1991, Overton 2001).

Students also propose their own examples of loss of significance and discuss the ways of implementation of such examples at the lessons of Informatics or Mathematics at school. It fosters the developing their professional competences and helps to prepare for their future professional life.

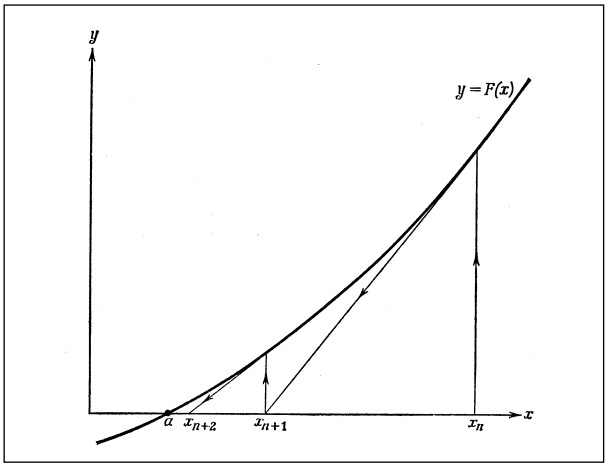
Students also have an opportunity to send solved tasks for assessing to the teacher via Moodle tools and obtain feedback. The teacher uploads some tasks solved by students into e-learning course with his comments for analyzing by other students. For example, the teacher presents the typical mistakes of the students and explains the correct solutions of the problems. In the same manner the teacher supports the students' project work.

2.4. Assessment of the level of competences, using tests

For assessment the level of students' informatics competences we elaborated test questions of three levels of difficulty: beginner, intermediate, advanced.

Beginner - memorizing the main concepts of Numerical Analysis, retrieving the information from the memory concerning the main numerical solution methods.

Example 1. Identify the numerical solution method, which graphical illustration is given below:



1) Iterative method;
2) Newton's method;
3) Dichotomy method;
4) Secant Method.

Intermediate - analysis of the features of the numerical solution algorithms, determining the limitations of implementation numerical solution methods for problem solving and comparing methods of the numerical solving of the mathematical problems.

Example 2. What does determine the number of approximations that should be calculated to find the root of the equation $f(x) = 0$ with accuracy ε, using the iterative method?

1) the value of the initial approximation;

2) the length of the root isolation segment;

3) type of the function $\varphi(x)$ ($f(x)=0 \Leftrightarrow x=\varphi(x)$);

4) value of the accuracy ε.

Advanced – choosing the numerical solution methods, according to problems; evaluation of the effectiveness of the numerical solution methods.

Example 3. To what class of the problems relate the following one:

$$\begin{cases} 2.5x+1.0y=3.2, \\ 5.0x+1.2y=6.5 \end{cases}$$

1) well-conditioned problem;

2) ill-conditioned problem?

At the beginning we created pool of questions divided on the categories, according to the difficulty levels. Then, we generated tests for each learning module and for final assessment. We used Moodle tools for elaborating tests, choosing different available forms of questions: matching, True/False, multiple choices, short answer, numerical, calculated etc.

Convenient Moodle tools allows the teacher to choose the quantity of students' attempts in one test session, evaluation scales and rules of getting scores (for example, correct answer for of higher level questions gives more points). Students' scores are added to the journal of the academic group automatically. The teacher reviews the report about the group work in general and activity of certain student particularly, offers his help to students who have difficulties.

CONCLUSIONS

The studying process of Numerical Analysis should be improved according to the new demands of information society for students' preparation. It is necessary to implement up-to-day methods and technologies of education aimed at the developing of students' professional competences.

In this article we focused on the ways of improving professional competences of future teachers of Informatics and Mathematics at the studying process of Numerical Analysis. We presented the main components of an elaborated e-learning course and the results obtained from observations of different types of students' learning activity.

In the process of filling glossaries, using learning materials elaborated on the base of CAS Maple, problem solving, assessment the level of competences (using tests), students improve their professional competences: general and professional as well as Informatics competences. Particularly, using CAS for familiarizing with numerical solution methods they acquire competences to deal with such types of software for

solving tasks; carry out computer experiments; to get knowledge about restrictions of performing computations, using ICT etc.

Students have opportunity to work independently as well as in groups, taking part in projects, discussing problems, filling glossaries. Choosing the level of difficulty of learning materials, they create their individual learning paths.

The results of observations show that after short period of time students become to feel free in expressing ideas and communication with their peers and with the teacher for solving problems. In consequence, they become confident and motivated in learning Numerical Analysis.

Moodle tools are quite convenient for elaborating tests that involved questions of different types and levels of difficulty. Installing necessary properties of tests, it is possible to quickly assess the level of students' competences in Numerical Analysis.

Tools for monitoring the studying process give actual information to the teacher about students who have difficulties in learning Numerical Analysis and need his help. Students could also review their scores and make a reflection on ~~of~~ their own learning activity.

Thus, using e-learning tools in the process of studying Numerical Analysis fosters improving their professional competences and develops their skills to learn throughout the whole life.

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TEACHING HOW TO CODE
WE TEACH THROUGH THE CODING

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Abstract: *This article describes the beginnings of searching new methods of organizing the teaching process of coding on the stage of lower secondary school, which is now in Poland for students at the age of 13-16 years. The new students' work organisation should be favourable to maximizing the effects of teaching through coding (thanks to coding). The starting point is the description and analysis of a real didactic situation.*

Keywords: coding, code to learn, Agile method, Scrum, Scratch.

INTRODUCTION

For Professor Mitchel Resnick from Massachusetts Institute of Technology, Media Lab (USA) the modern "digital fluency" should mean designing, creating, and remixing, not just browsing, chatting, and interacting. Further he adds: many young people are very comfortable sending text messages, playing online games, and browsing the Web. But does that really make them fluent with new technologies? Though they interact with digital media all the time, few are able to create their own games, animations, or simulations. It's as if they can "read" but not "write". (Resnick et al. 2009: 60, 62)

Then – as teachers – we should look for new ways of teaching young people "to write" in the digital world, in other words teaching them to code. Teaching (or learning) to code we simultaneously teach (learn) through the coding, by means of coding. Professor Resnick concluded it in the slogan: Learn to Code, Code to Learn. He also adds: the biggest challenges for the future are not technological but cultural and educational. Ultimately, what is needed is a shift in mindsets, so that people begin to see coding not only as a pathway to good jobs, but as a new form of expression and a new context for learning. (Resnick 2013)

This article describes the beginnings of searching new methods of organizing the teaching process of coding and therefore the new methods of teaching through

coding (by means of coding). The starting point is the description and analysis of a real didactic situation from May 2014.

1. DESCRIPTION AND QUANTITATIVE ANALYSIS OF THE DIDACTIC SITUATION

The analysis of the presented didactic situation had not been planned before and during the execution of described students' projects. The author decided to analyse anonymized results of the described didactic situation after the end of the school year. We can therefore define this text as an extended analysis of educational results of students.

Students of the third grade of lower secondary school were given a task to create an educational game in the Scratch programming environment. The inspiration for this project could have been found in global campaign for young programmers „The Hour of Code", which was coordinated in Poland by Professor Maciej M. Sysło from the University of Wroclaw and Nicolaus Copernicus University in Toruń and Anna Beata Kwiatkowska from Nicolaus Copernicus University in Toruń.

Also before, the mentioned third grade students took part in that campaign by creating an essential code for solving simple puzzles. Thus, in December 2013 they joined several millions of people from all over the world who are keen on computer programming. Today – the website of the campaign is accessible in web all the time – the number of people who tried coding there exceeded 40 million (http://csedweek.org/). So we can grasp an opportunity to propose a thesis that computer programming (coding) is in its peculiarity an intercultural activity. Yet it unites programmers from the whole world and enables them to express themselves in languages comprehensible to them (not necessarily in natural languages).

The choice of Scratch as a programming environment for creating an educational game by the students was not accidental. Scratch is a visual programming environment that lets users create interactive, media-rich projects. People have created a wide range of projects with Scratch, including animated stories, games, online news shows, book reports, greeting cards, music videos, science projects, tutorials, simulations, and sensor-driven art and music projects. (Maloney et al. 2010: 1)

Scratch builds on the constructionist ideas of Logo (Seymour Papert) and Etoys. To help users make their projects personally engaging, motivating, and meaningful, Scratch makes it easy to import or create many kinds of media (images, sounds, music). The Scratch Web site provides a social context for Scratch users, allowing users to share their Scratch projects, receive feedback and encouragement from their peers, and learn from the projects of others. (Maloney et al. 2010: 3)

Scratch is a project of the Lifelong Kindergarten Group at the Massachusetts Institute of Technology, Media Lab (USA). It is provided free of charge.

The game, which students had to create in Scratch programming environment, was to rely on noughts and crosses (tic-tac-toe) game principles, on the board with 9 fields (Figure 1). Additionally, students had to introduce one difficulty in their game: a player can mark his field with a sign (circle or cross) only when one gives a right result of a mathematical operation (with exponentiation), hidden under the selected field. The information about the next player's turn had to also be shown on the screen.

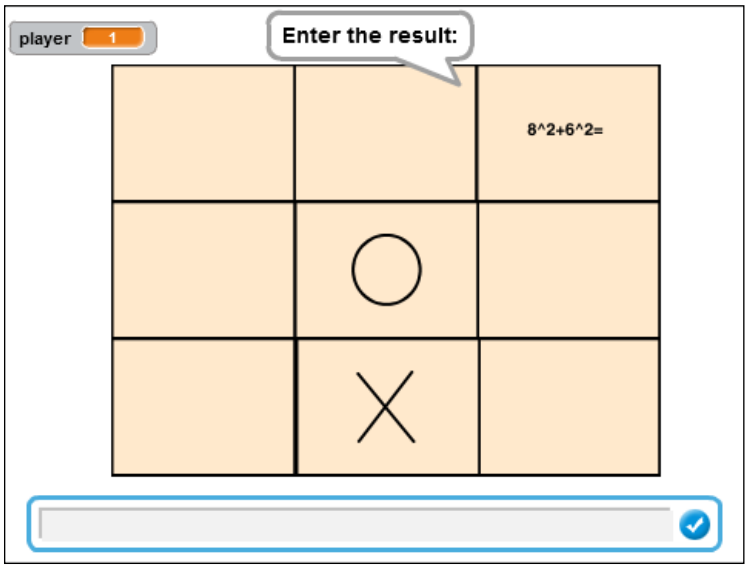

Figure 1. The game created on the basis of a videoguide
Source: Author's own resources

The project required control over three areas of the created game:

- game logic;
- scripts – game engine
- interface and object location on the screen.

The engine of the game (scripts) has been created in the visual programming environment (with using puzzles) based on The Scratch Object Model (Sprites). Sprites are objects: they encapsulate state (variables) and behavior (scripts). However, since Scratch has neither classes nor inheritance, it is an object-based language but not an object-oriented one. (Maloney et al. 2010: 10)

Scratch scripts are built by snapping together blocks representing statements, expressions, and control structures. The shapes of the blocks suggest how they fit together, and the drag-and-drop system refuses to connect blocks in ways that would be meaningless. In Scratch, the visual grammar of block shapes and their combination rules play the role of syntax in a text-based language. (Maloney et al. 2010: 7)

The main source of help for students while creating the game was the videoguide in Polish language. The guide had been created in Scratch programming environment 1.4 version. Students could make their own decisions whether they want:

- to create a project in 1.4 version (like in the videoguide) and to deal with files of the project by themselves (check up-to-date file status, back-up copies and submit the right file to a teacher) or
- to create – on the basis of the videoguide – the same program (game) in newer Scratch 2.0 programming environment (with an opportunity of keeping a file on the server, always in the last version, providing a teacher with a link to the created project only once).

Interestingly enough, only 4 of 75 students decided to choose the 1.4 version of Scratch (which is apparently easier, because it does not require any adjustments, it is the same as in the videoguide).

The students worked generally individually. The time given was 2 weeks. During their work over the project they could also:

- attend consultations with their teacher (2 terms);
- ask their colleagues for additional explanations and tips;
- use the asynchronous communication module to contact the teacher and colleagues; the module is a part of the electronic class register used at school;
- get acquainted with similar projects created by the community of Scratch users from all around the world (the projects are available at: http://scratch.mit.edu/explore/);
- get a comment to the created game from the teacher (only once).

The project should have been made and submitted by 91 students. Quite a significant group of students (16 people, which is 18%) decided not undertake the task of creating the game.

Table 1 collectively introduces students' marks. The quantitative analysis of the marks can cause the teacher's satisfaction. Almost 60% of the marks are the highest ones: 5 and 6. The predominant mark was 5 (the mode). No 2 or 1 marks were given. High average mark (4,57) with minor standard deviation (0,62) describes a group with a high and equalised level of educational achievements.

Table 1.
Collective comparison of marks received by students for the project

Mark	Number of marks	Percent of submitted works
6 (excellent)	2	3%
5 (very good)	42	56%
4 (good)	28	37%
3 (satisfactory)	3	4%
Total	75	100%

Source: Author's own work

It is difficult not to agree with above mentioned statements. Where can we spot problems, if any? What can be considered dissatisfying? We can try to answer these questions only on the basis of the qualitative analysis of the process and results of the described project.

2. QUALITATIVE ANALYSIS OF THE DIDACTIC SITUATION

The first serious problem is high percentage (18%) of students who did not submit the work. Every student – according to the rules of evaluation in computer science at this school – is entitled not to prepare a chosen computer exercise, project or any other evaluated work once per semester. 16 students decided that they would not submit this project.

Only 2 projects (which is less than 3% of submitted works) did not contain errors and additionally had new functions implemented, which were not described in the videoguide. Only these 2 projects were evaluated with the highest possible mark: 6.

In several projects students implemented their own ideas, however they committed errors in the main part of the project (presented in videoguide) in one of three areas of the created game (logic, game engine, interface). As a result they were awarded grade 5.

The majority of the errors made, which resulted in 4 and 3 marks could have been eliminated at the stage of sufficiently long tests of the created game. Instead of testing and correcting by themselves, some students only expected the teacher's comments and mark, which appeared to be lower than expected.

We can blame the students for the lack of motivation while working, for giving the project not enough time and/or unwillingness to get a teachers comment on the earliest stage of work. We can.

However, we can also ask a question, whether creating software (even a simple educational game) as individual projects is the right approach. Admittedly, the students in this particular didactic situation had the possibility to cooperate with

their teacher and colleagues, as well as the chance to get feedback from the teacher, however the project was their individual responsibility and they submitted it to evaluation also individually.

Searching the right methods of teaching through coding (by coding), should not we pay particular attention to the way the work of a team creating a computer program (e.g. a game) is organized? Perhaps it is worth ~~to~~ thinking about how the organization of a software production process itself determines the later success or its lack.

Would a group (preferably a self-organized group) deal with a project much better? Possibly, among the obtained products there would be more of those, which could be evaluated as grade 6. Is it the quality of software that users care about?

So, if we consider conducting a coding project by a team of students, a team approach to creating software already on the level of lower secondary school (e.g. in such programming environments as Scratch, NXT-G, App Inventor or Processing), what should be done to organize it?

3. SCRUM METHOD IN EDUCATION?

3.1 Scrum as a method in accord with Agile Manifesto

In autumn 2013 the author of this article turned his attention to the so called agile methods, which are used by professional programming teams, taking Scrum method into particular consideration.

Scrum is the method, which is conformed to Manifesto for Agile Software Development (http://agilemanifesto.org/). Such a declaration was accepted by the group of programmers during the meeting in Snowbird center (USA) in 2001. The programmers gathered agreed that the way of their work over the development of software (and assistance to others in this field), first of all takes into consideration:

- individuals and interactions over processes and tools;
- working software over comprehensive documentation;
- customer collaboration over contract negotiation;
- responding to change over following a plan. (Agile Manifesto 2001)

A manifesto of software developers formulated in such a way makes up an alternative to traditional approach, which is based on a cascade model.

Scrum is a process framework that has been used to manage complex product development since the early 1990s. Scrum is not a process or a technique for building products; rather, it is a framework within which you can employ various processes and techniques. (Schwaber and Sutherland 2013: 3)

Scrum is founded on the empirical process control theory, or empiricism. Empiricism asserts that knowledge comes from experience and making decisions based on what is known. Scrum employs an iterative, incremental approach to optimization of predictability and risk control. (Schwaber and Sutherland 2013: 3)

For the first time the author of this article presented in public his idea of applying agile methods in education during PRIT Conference in České Budějovice, Czech Republic (June 2013) in his statement entitled *Použití iterační metody během tvoření a programování robotů LEGO MINDSTORMS* (*Usage of iterative method during construction and programming LEGO MINDSTORMS robots*). The author presented a possibility of using the iterative method (on the example of Scrum) during the work with students, in the field of construction and building LEGO robots.

In Scrum method work is being done in groups called The Scrum Teams.

The Scrum Team consists of a Product Owner, a Development Team and a Scrum Master. Scrum Teams deliver products iteratively and incrementally, maximizing opportunities for feedback. Incremental deliveries of "Done" products ensure that a potentially useful version of a working product is always available. (Schwaber and Sutherland 2013: 4)

The work of teams in every stage of project realization is precisely determined in time.

The heart of Scrum is a Sprint, a time-box during which a "Done", useable, and potentially releasable product increment is created. Sprints have consistent duration throughout a development effort. Sprints contain and consist of the Sprint Planning Meeting, Daily Scrums, the development work, the Sprint Review, and the Sprint Retrospective. (Schwaber and Sutherland 2013: 7)

Scrum method undoubtedly requires adaptation for didactic process needs, which is carried out at the stage of lower secondary school. It is necessary to check out carefully all the elements of the method: the role of particular persons, Scrum events and artifacts.

3.2 The culture of remix and Scrum

Scratch users community members share their ideas by creating remixes of projects.

Over 15% of the projects there are remixes of other projects on the Scratch site. (Resnick et al. 2009: 65)

Professor Resnick and his co-workers mention that, at first, some Scratchers were upset when their projects were remixed, complaining that others were "stealing" from them. That led to discussions on the Web site's forums about the value of sharing and the ideas behind open source communities. (Resnick et al. 2009: 65)

The goal of Scratch originators is to create a culture in which Scratchers feel proud, not upset, when their projects are adapted and remixed by others. They also add that the Scratch Web site has already become a vibrant online community, with people sharing, discussing, and remixing one another's projects. (Resnick et al. 2009: 65-66)

Can the idea of remixing be connected with the Scrum method?

In the author's opinion a certain chance of such a connection can be traced. The Scrum Teams – consisting of a Product Owner, a Development Team and a Scrum Master – are working while Sprint duration on a product's development (computer program; in our case: an educational one). At the end of a Sprint a team has to deliver a working product, which fits the definition of "Done" (which meets the terms specified in that definition).

There is a possibility to do some research on development effects of a product if the work on a product is transferred to another team every Sprint, for a period of one (next) Sprint.

There is a possibility that transferring ~~a~~ work on a project to another team will contribute to quality deterioration of a product itself (e.g. educational game). However, from the teacher's point of view the more interesting thing is whether a group that, received a project from their colleagues, is involved into it more than their predecessors or less; whether they get more or less motivated to work; whether as a result their skills and knowledge, for example, become more permanent.

Such transferring a shared project can be very easily done on Scratch Web site, using the remix function. It is worth mentioning that transferring the project to a new team (meaning a new user of Scratch community) does not cause erasing the information about the author (authors) of the base project from the system. Such a way of remixes functioning allows to follow the evolution of a project, even if it is created (on the next stages – during the next Sprints) by other users.

The complete information about the evolution of a shared project is stored as a „remix tree", which grows out from the base project.

We should remember that the goal of the actions described here is not to educate a horde of excellent programmers. The goal (which the title of this article mentions) is to use coding as a specific background, which allows to arrange a situation where a student in order to write (create) a fragment of working script (a fragment of working program code) needs to complete the lack of knowledge or gain new skills.

This idea is perfectly and briefly described by professor Sysło in his statement on this year's X Conference of School Computer Networks Administrators KASSK 2014 in Nowy Tomyśl (Poland): informatics competences = competences in solving problems using computers = competences in solving any problems. (Sysło 2014: 6)

Professor Resnick adds: in the process of learning to code, people learn many other things. They are not just learning to code, they are coding to learn. In addition to learning mathematical and computational ideas (such as variables and conditionals), they are also learning strategies for solving problems, designing projects, and communicating ideas. These skills are useful not just for computer scientists but for everyone, regardless of age, background, interests, or occupation. (Resnick 2013)

Teaching algorithmics and coding at school we teach children and youth to solve problems creatively and express themselves in the language of the 21st century.

3.3 Work plan

During the school year 2014/2015 the author is going to take a closer look at the following issues:

1. Specifying the role of division in teams (students, teacher), checking its legitimacy, taking a closer look particularly at the role of a teacher in a team.
2. Planning and testing the course of Scrum events such as: Sprint, Planning Meeting, Daily Scrums, the development work, the Sprint Review and the Sprint Retrospective.
3. Defining (for the needs of the project group) the artifacts appearing in the method: Product Backlog, Sprint Backlog, Definition of "Done".

The planned working environment for students will be visual programming environment: Scratch version 2.0.

Deciding on Scratch, the author appreciated the following features:

- no fee for using the environment,
- decent Polish language version of the product,
- availability of the version both in on-line and off-line mode,
- available for operating systems: Microsoft Windows, Mac OS X and also Linux,
- lack of error notifications – commands should fit each other by a shape of the puzzle on which they are saved,
- eye-catching interface, attractive to kids at the age of 8 and older (8+),
- constantly growing community of users,
- possibility of project remixing.

In the author's opinion, by organizing the work of students teams based on Scrum method, we have a big chance to achieve title effect: teaching how to code we teach through the coding. We can simultaneously teach youth while working on the creation and development of a computer program (e.g. educational game) in such aspects as:

- planning team work according to specific rules;
- keeping up with deadlines and meeting their commitments;
- effective communication in a team;
- using the received feedback;
- delivering working products, which could be developed further.

In the author's opinion, if we manage to join the postulated working method (based on Scrum method) with programming challenges students are interested in (that match their age and programming environment possibilities), we can increase the chance to achieve the educational success of students.

CONCLUSION

Professor Maciej M. Sysło, while diagnosing the present level of teaching computer science in Polish schools, concludes that:

1. Computer science education in schools does not keep up with the changes in the range of computer science methodology of teaching. (...) The realization of algorithms within the scope of computer science class in lower secondary school is very rare.
2. Computer science education very rarely appeals to the actual application to the students' everyday life (…). (Sysło 2011: 4)

Undertaking the task to adapt Scrum methods to the needs of education, the author (together with his co-workers from the project of Laboratory of Robotics) tries to find a solution, which will be helpful in preventing the phenomena described by Professor Sysło.

The author wishes that a searched working method for teams of young programmers was based on the methods used in adults' present-day world. He is searching for a method that will help students create and develop programs in teams, also challenging the real trials, which students face in their everyday life.

Today it seems that Scrum and a certain form of its adaptation to the school conditions is the answer.

We would like to invite all the interested to cooperation.

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E-LEARNING IN THE DEVELOPMENT OF THE KEY COMPETENCES. METHODS, FORMS AND TECHNIQUES IN DISTANCE LEARNING. M-LEARNING

EDUCATIONAL MATERIAL — BUT WHICH ONE? THE MOST COMMON PROBLEMS AND MISTAKES OF PEOPLE PROJECTING ONLINE CLASSES

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Abstract*:One of the most important tasks faced by universities implementing e-learning solutions is a matter of preparing educational materials. One has to pay a special attention to it as it is a key matter. Wrongly prepared educational materials do not provide students with the possibility to work on their own at home and the teacher faces a huge challenge if he has to add information or explain in a written form (on a forum or chat) some problems or phenomena which were not fully explained in the materials prepared in advance.*

The aim of the article is to present the most common problems and mistakes made while projecting educational materials and showing how to avoid them.

Keywords: e-learning, e-learning methodology, preparation of e-learning courses

Biographical notes:

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Dominika Goltz-Wasiucionek a graduate of English Philology. Works as a teacher and translator since 1997. Currently a student of the last year of doctoral studies at Kazimierz Wielki University in Bydgoszcz. Her interests involve teaching English and especially using educational platforms in the process of teaching-learning English. Published numerous articles concerning teaching English and the use of blended learning in teaching foreign languages. At present works on her PhD dissertation aiming at evaluation of e-learning effectiveness in the process of teaching-learning English.

1. INTRODUCTION

Many academic institutions in Poland have already started the trials to implement e-learning solutions. Though since the first online classes were conducted it has been already ten years there is still lack of systemic solutions. Many institutions forget about the fact that solid methodological basis referring to preparation of educational materials, organization of courses and studies online as well as conducting online classes have to be prepared.

In many countries which base their system of distant learning on American solutions (in the United States as well) it was assumed that the basis for creating online classes is Instructional Design (see: Zając 2004). It is a theory of education introduced by Robert Mills Gagné, the representative of American psychology of learning (Figure 1).

This theory is a synthesis of research conducted by behaviourists and cognitivists in which Gagné specified the rules of teaching leading to increased activity of a student/learner. This process was described in nine universal steps, considered nowadays crucial in designing classes:

- Motivate the Learner;
- Explain What is to be Learned;
- Recall Previous Knowledge;
- Present the Material to be Learned;
- Provide Guidance for Learning;
- Active Involvement;
- Provide Feedback;
- Test Comprehension;
- Provide Enrichment or Remediation.

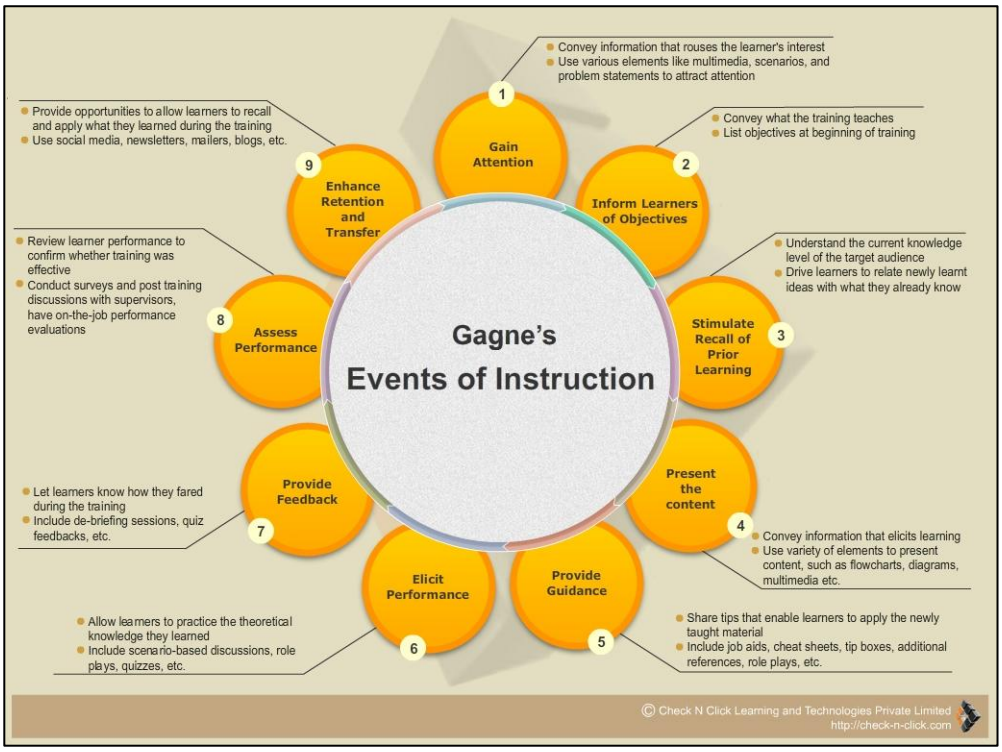


Figure 1. Gagné's Instructional Design

Source:http://check-n-click.com/wp-content/uploads/2014/02/Gagnes_Nine_Events_Instruction.jpg

R. M. Gagné put the major emphasis in this model on designing the didactic process in such a way that it is strictly connected with student's/ learner's cognitive needs.

Writing about presenting the new material Gagné explained that it is necessary to use different strategies to present and cue lesson content to provide more effective, efficient instruction. Organize and chunk content in a meaningful way. Provide explanations after demonstrations. *Ways to present and cue lesson content include:*

- present vocabulary
- provide examples
- present multiple versions of the same content, e.g., video, demonstration, lecture, podcast, group work
- use a variety of media to address different learning preferences (Gagné, Briggs, Wager 1992).

As Jeffrey Goldman states while designing e-learning courses, some interpretive liberties with each Gagné's steps should be used because these were not originally designed with e-learning in mind so some liberal interpretations must be

made. Goldman suggests that presentation in e-learning courses was interactive, can take a form of a story broken with questions and input from the learner, games, branching scenarios/sims, etc. He himself uses interactive Flash animation to put emphasis on the content and to allow practice and application of the new skill or knowledge (Goldman., http://elearningcyclops.wordpress.com/2009/01/29/using-gagnes-9-events-of-learning-in-e-learning/).

R. M. Gagné's model is not the only set of instructions used by e-learning designers. Since the 1990s another model is eagerly used in designing classes — ADDIE (acronym of: Analysis, Design, Development, Implement, Evaluate). It describes a series of 5 phases contained in the model (Figure 2.).

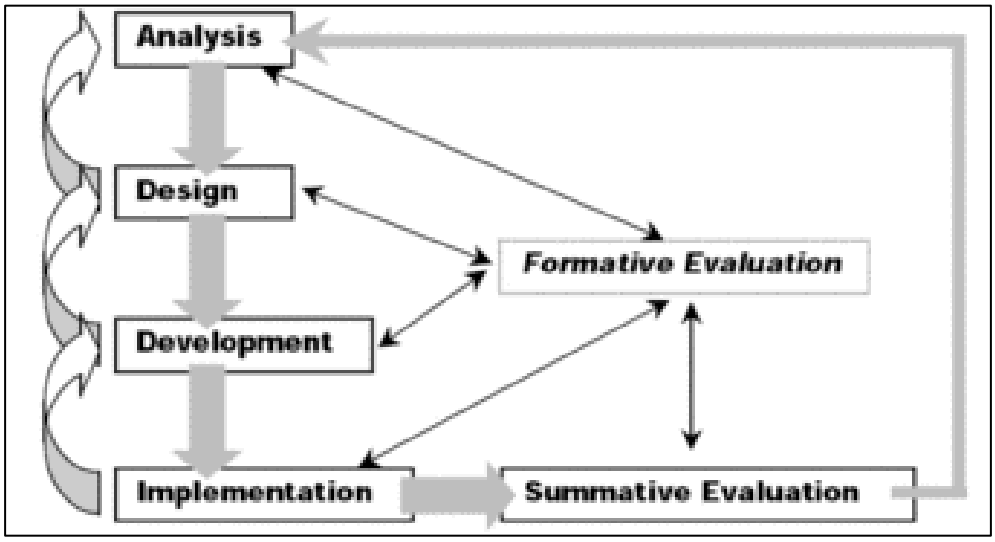


Figure 2. ADDIE Model

Source: Steven J. McGriff, http://www.instructionaldesigncentral.com/htm/IDC_instructionaldesignmodels.htm#addie

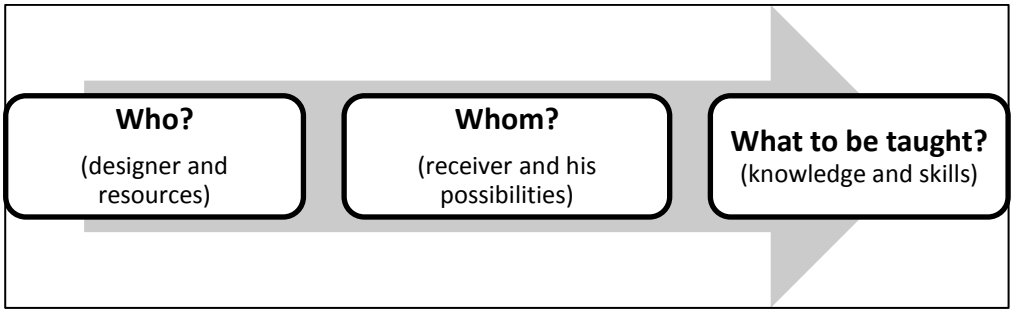


Figure 3. Meta-questions at the first stage (analysis) of designing online

Source: own work

Analysis (phases of questions) at this phase there is a full insight into institutions or individual's possibilities concerning the design of online classes. This phase (very often understated while preparing educational materials) is about asking a number of meta-questions answers to which condition further work.

Design (phases of ideas) is organizational preparation for development work, seeking right tools and software, which can be used while completing a project or e-classes. At this stage a detailed didactic concept of a course is prepared – precisely formed initial demands concerning course participants, standards of education as well as conditions for completing and reaching the assumed effects of education are formed. It is also a time for seeking ready-made resources (texts, graphics, films etc.), which are connected with the topic and can be used in the development process.

Development (production stage) is a time for designing parts of classes i.e. single resources which in connection make the whole distant course:

- materials serving as the distribution of knowledge and building it- didactic contents, case study and different types of visualizations of the described phenomena and processes (static graphics, animations etc.)
- materials allowing consolidation of knowledge and skills – summaries, factsheets, activities based on self-evaluation (i.e.: closed tasks which are not graded: choice tests, true-false tasks, filling in the gaps, crosswords);
- materials checking knowledge and skills – test, open tasks, project, group work etc.;
- activating materials — which task is to involve and motivate, such as: stimulations , additional Internet resources, planned forum discussions;
- materials informing about the e-training — these are designed at the very end of production stage rules of working and description of the course of classes, rules of evaluation etc., collecting information about the process of education.

Implementation which is making the materials available to students/learners. At this time there is a final verification of the resources, i.e.: their usefulness, didactic effectiveness and the level of completing the set didactic aims.

The last phase, **evaluation**, is an internal and external evaluation of quality of classes.

Currently most of instructional design models are varieties of the ADDIE model based on R. M. Gagné's theory. Designers of e-learning courses take also into account, apart from different learning strategies, the specifics of online education. It means that single learning units are small, should not be longer than 15-20 minutes, and a traditional form of lecture should be replaced by active methods, discussion (between students, students and the teacher) as well as group work (project work, case study) (see: Zając 2004).

2. DESIGNING AND COMPLETING E-LEARNING CLASSES

The process of designing e-learning classes is determined by many factors that is why it is so important to be prepared for it – both as an institution (completing classes is connected with certain organizational changes, involvement of people taking care of the educational platform and preparation of multimedia didactic resources) and individual on the side of academic teachers (responsible for preparation of the materials and conducting classes).

One of the most important issues is the authorship of the materials for online classes. Preparation of activities, tests and other didactic materials may be work of one person or a team of teachers and specialists dealing with methodology of distant learning and design of multimedia. The latter option seems to be more practical as it allows avoiding substantive mistakes and allows enriching the classes with more different resources – text, graphics; audio or video (see Dziubińska, Wierzbicka 2011). Team work while preparing e-learning classes is legitimate also because of the necessity to be acknowledged with the platform tools, providing graphical/software design of the prepared materials. If an institution decides to start such a solution it seems that the most important issue is appointing a coordinator who will be responsible for managing the work of authors. Managing such a team should involve: proportional division of contents to be prepared by authors, appointing detailed tasks which concern stages of courses (before the course, while running the course, and after the course). The author's main tasks should be in such a case preparation of materials according to the coordinator's guidelines, introducing the material to the platform and their substantive correction.

Due to the fact that the main topic of the article are problems and the most common mistakes while preparing educational resources, the authors will not describe all the stages of designing an e-learning course but will focus on the key stage i.e. design of the resources (according to ADDIE model).

3. DESIGN OF EDUCATIONAL RESOURCES – THE MOST COMMON PROBLEMS AND MISTAKES

No matter whether the resources are prepared individually by a teacher or by the whole team consisting of specialists (i.e.: the author responsible for the value of the contents – teacher, coordinator, methodology expert, text editor, graphic designer, software designer) some problems and mistakes should be expected. They are most often caused by lack of knowledge of e-learning specifics. This problem concerns especially academic teachers who usually on their own search for information about designing e-learning courses and are not supported by any institution (in Poland only some institutions created units responsible for e-learning which organize trainings for teachers and offer some methodological support). That means that e-learning designers lack solid knowledge and skills concerning: methodology and didactics of distant teaching (and unfortunately very often general didactics as well as subject

didactics as many Polish universities – apart from teacher specializations - do not have such classes) graphics visualizations or multimedia design.

Shifting the whole didactic process to the www network (most commonly educational platform) means in such a case copying ideas and solutions from face-to-face classes. The supreme aim is in such a situation providing knowledge (most often an s a text file), adding some activities or tests checking knowledge and skills and allowing teacher's evaluation.

Meanwhile e-learning course educational resources should include different materials, fulfilling certain functions:

- Providing and building knowledge and skills.

  These include: didactic contents, case studies, web resources, dictionaries and all the types of visualisations of the described phenomena and processes. They can take a form of text, graphics static/dynamic) as well as audio-visual (audio/video/audio-video files).

- Consolidation of knowledge and competencies.

  Shared completion of open tasks: project or activities such as: count, compare, describe, problem ones, completing in stages at forums, discussion questions (prepared for forum, chat or video conference) as well as individual tasks based on self-evaluation (not evaluated closed tasks: multiple choice tests, true-false, match elements, drag and drop, crosswords). The form of the materials may be a text one, additionally enriched with graphics (static/dynamic).

- Motivating and making students/learners active.

  Through discussion on forums, group evaluation of other participants' work, evaluation of additional sources of information, i.e. rating, tagging. The form may be: text, parts of consolidation can be in a form of graphics (static/dynamic) or audio-visual (audio/video/audio-video files).

- Checking knowledge and skills.

  Shared completion of open tasks: project or activities such as: count, compare, describe, problem ones, completing in stages at forums, discussion questions - forum, chat or video conference) as well as individual closed tasks (multiple choice tests, true-false). The form of the materials may be a text one, additionally enriched with graphics (static/dynamic) as well as audio cast/video cast (audio/video/audio-video files).

- Instructing students/learners.

  Materials gathering information about the course of the educational process: instructions, and classes including time for completing the stages as well as

any other organizational information connected with a fluent flow of the whole process of education.

Only matching these five elements solidly ~~fulfilling~~ prepared at the stage of the analysis (ADDIE model) of aims and effects of education, guarantees the success of distant education.

3.1. Transferring and building knowledge

A commonly used way of transferring knowledge is preparing a text file including the most important information in a certain subject. E-learning designers use this solution very often as preparation of a PDF file is not very complicated. However, it sometimes appears that also in such a situation one can encounter problems and faults which influence the reception of the provided contents. These are:

3.1.1. Lack of solid language and editorial text correction resulting in the presence of language errors (Figure 4).

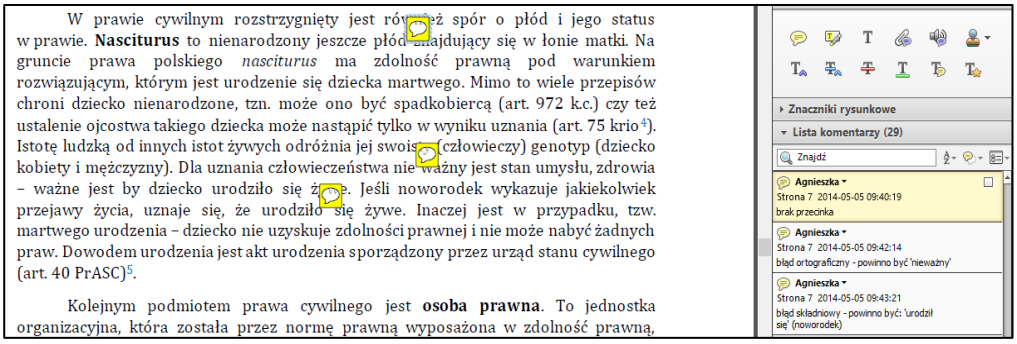


Figure 4. Part of contents with some language errors

Source: E-learning course: *Rules/Elements of civil and work law* prepared within EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

3.1.2. Lack of substantive text edition leading to the transfer of unchecked, contrary to the common knowledge information. This problem appears as the most often one in a situation when an e-learning course is designed by one author and does not undergo a substantial review.

3.1.3. Careless design of graphics, charts, illustrating the contents e.g. copying graphics or charts from other sources which make them illegible (this problem is common while copying from books); graphics is too small; charts include symbols which are not explained.

3.1.4. Lack of description of graphics/charts presenting the contents e.g. numbers and texts references referring to a certain number/graphics are not provided; very often sources of the graphics/charts are not given (Figure 5).

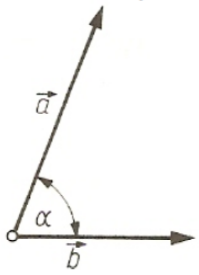
Dwa wektory można mnożyć przez siebie skalarnie i wektorowo. Dane są dwa wektory $\vec{a}$ i $\vec{b}$.

Iloczynem skalarnym tych wektorów nazywamy skalar równy iloczynowi modułów tych wektorów i cosinusa kąta zawartego między nimi.

$$\vec{a} \cdot \vec{b} = a \cdot b \cdot \cos\alpha$$

Iloczyn skalarny podlega prawu przemienności, czyli: $\vec{a} \cdot \vec{b} = \vec{b} \cdot \vec{a}$

Rys. 1.8.



Źródło: Siuta W. Mechanika techniczna WSiP Warszawa 2004 str. 22

Figure 5. Lack of illustration description in content of an e-learning course

Source: E-leaning course: *Technical mechanics essentials* prepared within EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

3.1.5. Lack of table of contents and specification of numbering of certain points, sub points which makes it difficult to find information and move in the text

3.1.6. Definitions, statements, examples, case studies are not numbered in the text which makes it difficult for students to move around the text and find information or referring to them e.g. during discussions or chats.

3.1.7. Wrong division of the materials into the main and additional ones which are only a complementary part. Very often scripts counting lots of pages are prepared, reading which during the time set by the teacher is simply not possible for students. In addition, too much information makes the students confused about which contents are important and which are additional. That is why it is advisable to divide the contents into the main one and additional by e.g. giving access to them in different files.

3.1.8. Design of multimedia materials. In a situation when the course is designed by an academic teacher he/she very often resigns from preparing this type of materials due to lack of equipment (software, camera) or skills. The situation is different when the course is prepared by a team consisting of specialists dealing also with graphics and software. The most common problem is creating a multimedia script. A teacher who lacks knowledge

about preparing such a resource (very often not supported by a specialist in e-learning), in a multimedia presentation gives copies of the same contents which are included in the script not paying attention to media and choosing wrong pictures. It makes the presentation, animation or film overloaded with text or elements making it more esthetical. These are adding effect, but are useless and not justified to be used form the point of view of didactics and distract students'/learner's attention (Figure 6).

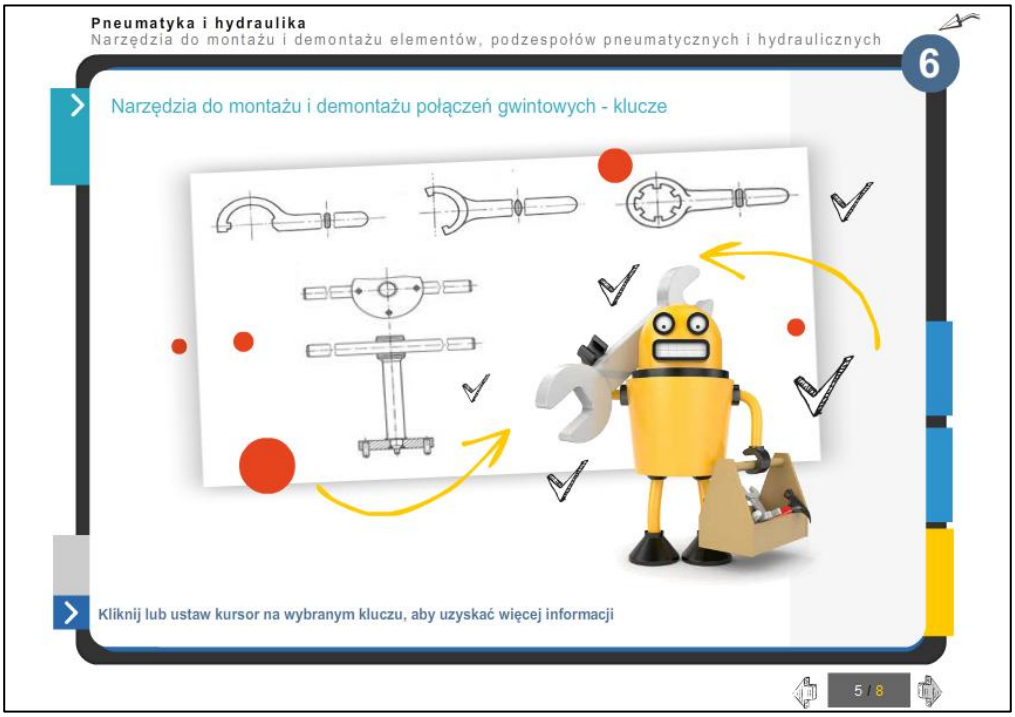


Figure 6. Part of animation: wrong proportions between graphics and additional elements (red dots, yellow pointers, a robot)

Source: E-learning course: *Pneumatics and hydraulics* prepared within EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

There are also additional mistakes connected with visualising the content. It happens very often that it is designed in such a way that makes it difficult to concentrate on the text or even reading it (Figure 7).

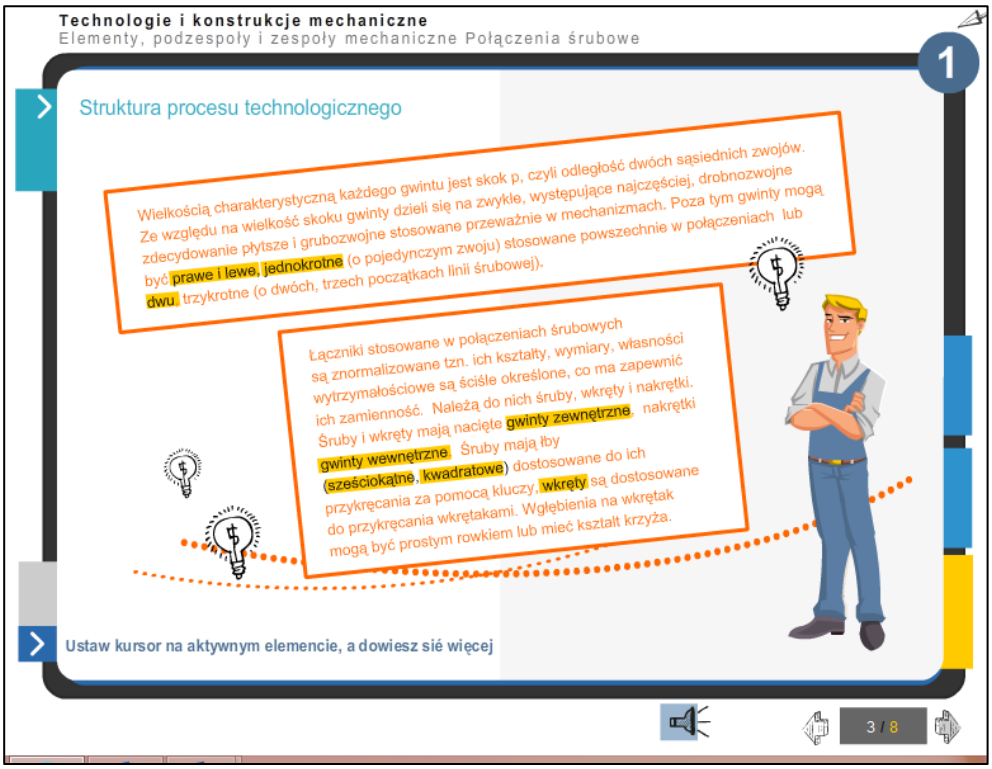


Figure 7. Part of animation: the texts is rising and there is a wrong choice of font giving too little contrast with the background making it difficult to read

Source: E-learning course: *Pneumatics and hydraulics* prepared within EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

Summing up it has to be highlighted that designing contents building knowledge should be connected with similar (even though not identical) activities as while preparing a book. The major stress should be placed on preserving substantive methodological, editing and typography care taking into account the specifics of multimedia design.

3.2. Consolidation of knowledge and competencies

Very crucial part of distant classes, requiring a good knowledge of didactics and methodology, are different types of resources which serve knowledge and competencies consolidation and are not graded at the same time. Teachers, while designing a course, prepare different types of quizzes i.e. closed tests, multiple choice, true-false, matching, drag and drop and open tests: filling in the gaps, short answers. The most common problems and mistakes occurring while designing this type of resources are:

3.2.1. Wrong test use and a superficial analysis of educational contents which leads to preparation of such tests (closed or open) which do not consolidate the knowledge, but only information chosen at random.

3.2.2. Preparation of closed tests against the rules of didactics and methodology (see: Okoń 1982) results from lack of knowledge of such rules (Table 1 and 2). The problem is especially visible at the level of higher education as academic teachers are not required to graduate pedagogical courses preparing them for work.

Table 1.

Wrongly prepared true-false tasks

Task	Answer	Comment
It is not true that in the method of mean arithmetic weight all the observations are given the same weight.	F	The statement 'it is not true' makes it ~~is~~ very difficult to give a positive/negative answer.
We say that evaluation of a certain parameter in an econometric description model does not differ significantly from 0, when MNK was not used to evaluate the value of parameters.	F	The 'no' appearing in a sentence together with a 'false' answer gives a double negation.
Should the describing variables be correlated with the described variable?	T	The sentence is not in a form of a statement

Source: E-learning course materials within an EFS project *E-learning. A modern and innovative university*

Table 2.

Wrongly prepared questions in multiple choice tests

Question	Comment
Wear of tenons in a crankshaft is established by: • **measuring the crankshaft diameter** • establishing the crankshaft weight • it is not possible to establish the crankshaft wear	Answer 2 does not grammatically fit the core of the question. Answers 3 and 4 are contrary to the core of the question.

Question	Comment
• the crankshaft does not wear	
Sulphur dioxide influences human body: • neutrally • causes suffocation • **is poisonous** • very poisonous	In this question the student has to choose between answers: 'poisonous' and 'very poisonous', which makes choosing the right answer difficult. The question is a test checking the knowledge of ~~on~~ semantic differences between these two answers.
The job of the target group? This question refers to: – **target group** – consumers – competition	The core of the question is unclear, the answer obvious

Source: E-learning course materials within an EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

3.2.3. Unclear, very often not linguistically correct tests e.g. *using materials provided in the module match the elements* — such a sentence contains a syntax mistake which is the wrong use of a contemporary adverbial participle which points to activities performed at the same time. Moreover, the instruction is not precise as it does not show directly what should be done and what and how to match.

3.2.4. Answer provided not intentionally in the questions following one another (Table 3.).

Table3.

Not intended answer in test questions

Question	Comment
1. CMYK is a set of :	The questions are one after

Question	Comment
• **four basic colours of printer paints** • three basic colours of printer paints • two basic colours of printer paints 2. CMYK is a set of the following colours • **cyan, magenta, yellow, key colour** • cyan, magenta, red, key colour • cyan, magenta, blue, key colour	another. It is enough to read question to be able to answer question 1.

Source: E-learning course materials within an EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

3.2.5. Many possible answers in open tests or different types of writing answers, e.g. gap filling tests (Table 4).

Table 4.

Many answers or different types of writing answers in gap-filling tests

Question	Comment
Transport in human life plays a _____ role. (crucial)	One can write in many answers: *important, significant, vital, esential,* etc. Moreover the questipn is trivial and it is diffcult to say what it checks.
Only _____ dissatisfied clients convey directly their claims. (5%)	There are different ways the answer can be written in e.g. *5%, five percent*. A clue should be given on how to write the value.

Source: E-learning course materials within an EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

3.2.6. Lack of feedback for the tests. The aim of such resources is to consolidate the knowledge, so while completing tests a student/learner should receive hints which allow understanding

the issue or will send back to materials building knowledge. This part of tests is very important because while self-study it serves as a comment given by the teacher in other types of resources.

Apart from closed tests, rarely used, but efficient resources for consolidation of knowledge and competencies are projects completed in a group work. Such elements should be based on the specifics of distant learning and the environment of learning. That is why it is very important to allow students a free distant communication (e.g. by creating a forum or chat). It is crucial to prepare precise instructions and description of stages of task completion — what is often said during traditional classes as additional explanation during distant classes should be written so that learners have no doubts what and how to do.

It is worth paying attention to the fact that teachers rarely decide to prepare discussion tasks connected with the problems of a certain part of a material. Forum or chat is a very good place for knowledge consolidation. While talking students may exchange information, place additional contents, check their knowledge especially when discussion is moderated by the teacher).

3.3. Motivating and making students/learners active

One of the most difficult tasks faced by e-learning classes' designers is preparation of such educational resources which will make the students'/learners' active and motivate them to regular work. In e-learning the most serious problem is a high (reaching 50%) percentage of people resigning from a course. That is why this type of resources should be well thought so that students become involved in the learning process connected with the aims of the course.

Moderated chats or discussions are used for motivation and making students active. It seems that preparation of involving and connected with learning aims tasks is very simple, but there are problems as well. Discussions or chats are rarely used in traditional classes so teachers do not often have experience connected with their preparation and moderation. Very often not really precise statements or assumptions occur referring to task completion (Table 5).

Table 5.

Wrongly formed discussion questions

Question	Comment
Be a moderator for a while at the beginning of a discussion. Start a discussion 'Is it worth designing?' Conclusions you should reach are answers to questions: What do we	The task is impossible to be achieved by all the students– each of them cannot become a moderator of one discussion 'Is it worth designing?' Moreover the topic is not really

achieve by net design? What does the project defend us from? Why nets without projects are more difficult in usage?	precise; we do not know all the aspect it should cover.
Place on the forum three photos you took yourself showing types of brakes (basic, standby and stopover). Compare the way they are built and used. Describe briefly their advantages and disadvantages – give reasons.	The way the instruction is formed excludes possibility of any discussion. It can be a task performed individually, but to be useful on a forum some element should be added e.g. mutual evaluation of descriptions and reasons.
On the base of a videocast entitled 'The notion of infrastructure' say what does infrastructure consist of. Share your ideas with other course participants on a forum. It will be moderated by the teacher.	The way instruction is formed excludes any possibility of a discussion and students are forced to reproductive activities. It is difficult to say what in this case is meant by moderation by the teacher and how the students should become active.

Source: E-learning course materials within an EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

Another type of resources which can be designed to activate and involve students/learners is asking them to evaluate additional sources of information by e.g. giving ranks or tagging. However, due to a low knowledge of platform tools teachers rarely use this solution.

3.4. Checking knowledge and skills

One of the most crucial elements of education is checking the results. Educational platforms allow teachers to check their students' knowledge in a different way, by grading: tests (teachers most often use multiple choice tests), open tasks and projects (individual or group) as well as discussions taking place at forums. In case of the two first mentioned resources checking knowledge and skills platform tools have the possibility of giving a grade, but also adding a comment or additionally, as in the case of tasks, sending another version of work corrected by the student. It should be highlighted that educational resources used for checking knowledge and skills have to fulfil the aims set by course designers and develop key competencies.

3.4.1. Tests

The way of preparing tests, checking student's achievement is not different from the one described in the part concerning knowledge and competencies consolidation. That is why the same mistakes as the ones described in 3.2.2 occur.

3.4.2. Open tasks and projects

The most common problem with these resources is not precisely formed instruction or description of grading criteria (or lack of them).

Table 6.

Example of instruction for open tasks

Instruction	Comment
BSA is an organization of commercial producers of a closed-source software, established in 1988 and working in 60 countries all over the world. Search for information concerning other organizations dealing with legal use of software, apart from BSA.	The question arises what is meant by 'search for'? Is finding information considered a well done task; maybe a written work should be prepared? What information is important? Moreover there is lack of any criteria of grading this task.
Choose which of the presented during the course divisions of tractors is in your opinion most often used. Think whether there is any other category according to which they can be divided.	This instruction does not present any information about what is required form the student. Especially the verb 'think' should be replaced by: describe, search for, crate, give reasons etc. There are no criteria of grading this task.
A mechanics spills old oil into a hermetic, safe container serving this purpose. Before closing tightly adds other types of oil, coolant and brake fluid. Then gives the barrel to the waste management unit. Is his behaviour all right?	A question formed this way can be answered yes/no. The instruction should be developed, e.g. 'Give reasons'. There are no criteria of grading this task.

Source: E-learning course materials within an EFS project *Model of the system of implementation and popularization of distant learning in lifelong learning*

The criteria of evaluating tasks or projects are a problem too, as they are often unified for the whole part of a course or even the whole e-learning course. Teachers, probably to make grading easier, assume that a student for each task will be awarded the same number of points e.g. from 0 to 5. It should be pointed out that the grade should be adequate to the task difficulty and time used for completing it — it is something different to describe a phenomena, and something else e.g. analysing it and showing its positive and negative effects.

3.4.3. Forum work

Apart from the pointed in 3.3. difficulties there are also problems with providing precise criteria for students' activity in a forum. It is worth in such a case to show students that what will be evaluated is content, communicativeness of their speech, creativity and involvement in the discussion with other participants of the course (e.g. constructive criticism or adding arguments to someone else's speech). Not least important is also precise presentation of points and avoiding general statements e.g. points will be awarded dependently on the difficulty of the tasks.

3.5. Instructions for students/learners

While describing different resources being part of an e-learning course it was shown how important are instructions for closed and open tasks, projects, or discussions. Communication in distant learning due to the used tools takes place most often in a written form. Everything what the teacher says during face-to-face classes referring to the activities, has to be written on a platform. Unfortunately, teachers very often forget about giving information, what in the case of an e-learning course results in many doubts and questions (very often identical) sent in e-mails. That is why preparation and access of students to all the information and instructions concerning organization, flow and evaluation of a course as well as possibility to ask questions concerning the mentioned issues, is crucial. So what has to be remembered is:

- general course description,
- table of course contents,
- aims and effects of education,
- rules of work during classes and the used tools (e.g. forum, chat, e-mail),
- rules of grading (described in such a way that refer both to the graded and not graded activities),
- schedule of work, which should include details about deadlines for completing parts of the material and students' activity.

4. CONCLUSION

Preparation of educational resources used in e-learning classes is a very complex process due to the fact of taking into account all types of activity and consoling them in a written form. Thus it is crucial to:

- give detailed completion of aims and effects set at the stage of design;
- analyze the way of completing the aims and effects, i.e. by choosing right resources;

- prepare a full course structure with specifying smaller parts (topics, modules);
- prepare resources used for providing and building knowledge and skills, consolidation of knowledge and competencies, motivating and making students active, checking the knowledge and skills as well as instructing students taking into account the specifics of distant learning and the used media.

Knowledge of didactics and methodology both the general one and specific for a given subject is required while designing distant courses. These spheres, often treated as less important in academic teachers' work, are the base in e-learning in order to lead the participants to the set aim and allowing to accomplish skills (i.e. different, complex competencies) consistent with the possibilities.

Skillful preparation of multimedia resources which students eagerly use is also crucial. Unfortunately Polish schools and universities very rarely provide teachers even with the basic skills. Only some Polish universities (Warsaw University, Warsaw School of Economic, University of Science and Technology, University of Economy in Cracow) support teachers by creating special teams of specialists who deal with multimedia design, but additional funds are necessary.

E-learning, completed in a form of classes based on writing, requires more care and responsibility for created resources — these are not as elusive as words spoken during a class or lecture. It should be remembered while starting work on designing an e-learning course.

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INFORMATION ETHICS AND CONTEMPORARY EDUCATION

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Abstract: *The paper deals with some selected problems connected with information ethics in education. The text of the paper is based on the Czech Republic environment. The author assumes that a proper solution of information ethics in education is one of crucial conditions for achieving educational goals. Finally, the well educated people are an important condition for the prosperity of the modern society.*

Keywords: information ethics, education, personal information, social networks, safety.

INTRODUCTION

The contemporary information society affects the lives of citizens in many areas. The creation of information sources, information processing, and use of information in our digital age require an appropriate 'information ethics'. This concept is under permanent development. On the other hand, the content of the term 'information ethics' can be understood differently in different cultural environments in the world.

Ethical dimensions of the information society are formulated in part C10 of Document WSIS-03/GENEVA/DOC/5-E as follows:

The Information Society should be subject to universally held values and promote the common good and to prevent abusive uses of ICTs.

- Take steps to promote respect for peace and to uphold the fundamental values of freedom, equality, solidarity, tolerance, shared responsibility, and respect for nature.
- All stakeholders should increase their awareness of the ethical dimension of their use of ICTs.

- All actors in the Information Society should promote the common good, protect privacy and personal data and take appropriate actions and preventive measures, as determined by law, against abusive uses of ICTs such as illegal and other acts motivated by racism, racial discrimination, xenophobia, and related intolerance, hatred, violence, all forms of child abuse, including paedophilia and child pornography, and trafficking in, and exploitation of, human beings.
- Invite relevant stakeholders, especially the academia, to continue research on ethical dimensions of ICTs.

1. INFORMATION ETHICS IN GENERAL

1.1 Content of the term and its history

The term information ethics stands for the branch of ethics that focuses on the relationship between the creation, organization, dissemination, and use of information, and the ethical standards and moral codes governing human conduct in society. Information ethics is a dynamic and evolving field. It is necessary to compare various perspectives and cultures in the times of intercultural exchange and dialog.

Information ethics is related to the fields of computer ethics, which deals with how computing professionals should make decisions regarding professional and social conduct, and the philosophy of information, which studies conceptual issues arising at the intersection of computer science, information science, information technology, and philosophy.

The history of the term information ethics was started in 1987 by Rafael Cappuro but some issues in information ethics were raised as early as 1980 by Barbara J. Kostrewski and Charles Oppenheim. The International Center for Information Ethics (ICIE) was established by Rafael Cappuro in 1999. The International journal of information ethics was founded by Robert Hauptman in 1992.

Information ethics, as applied ethics, deals with ethical questions as follows:

- in the Internet (cyberethics);
- in computer science (computer ethics);
- in the biological and medical sciences (bioinformation ethics);
- in the mass media (media ethics);
- in the library and information science field (library ethics);
- in the business field (business information ethics).

1.2 General principles of information ethics

A basis for formulation of general principles of information ethics should be the following articles of the Universal Declaration of Human Rights:

- Respect for the dignity of human beings (Art. 1);
- Confidentiality (Art. 1, 2, 3, 6);
- Equality of opportunity (Art. 2, 7);
- Privacy (Art. 3, 12);
- Right to be protected from torture or cruel, inhuman or degrading treatment or punishment (Art. 5);
- Right to own property (Art. 17);
- Right to freedom of thought, conscience and religion (Art. 18);
- Right to freedom of opinion and expression (Art. 19);
- Right to peaceful assembly and association (Art. 20);
- Right to economic, social and cultural rights indispensable for dignity and the free development of personality (Art. 22);
- Right to education (Art. 26);
- Right to participate in the cultural life of the community (Art. 27);
- Right to the protection of the moral and material interests concerning any scientific, literary or artistic production (Art. 27).

The general principles of information ethics should include:

- Copyright Act and other law measures connected with information should be respected;
- Free access to information should be enabled;
- Our privacy should be respected but some information should be known on the state level and protected appropriately against abuse;
- Information should be understandable, precise and true;
- Problematic thematic areas should be selected;
- Discussion on selected topics should be established because it makes better visibility of them and it should lead to the process of solving them;
- Problems should be solved in time and on professional level;
- People who work with information should be responsible;

- Two types of problems can be distinguished:
    - makroethics – connected with groups of people (e.g. unequal access to information, digital literacy, new technology competence);
    - mikroethics – connected with individuals (privacy protection, data safety);
- Rules which should be respected:
    - create new information is positive;
    - information should be disseminate without barriers;
    - dissemination of information should not harm anybody;
    - false information should not be disseminated;
    - everyone is responsible with consequences his/her behaviour in the field of information;
    - verification of information should be done by the help of more independent sources;
    - keep in mind that dissemination of some information can harm privacy of somebody else.

1.3 Key documents and law measures

The key document and law measures stated below were selected from the point of view the Czech Republic environment. They are as follows:

- Universal Declaration of Human Rights;
- 121/2000 Sb. – Copyright Act;
- 101/2000 Sb. – The Law on Personal data protection;
- 106/1999 Sb. – The Law on Free Access to Information;
- 257/2001 Sb. – The Library Law;
- Professional codices:
    - Ten Commandments of Computer Ethics by Patrick Sullivan from the Computer Ethics Institute in Washington:
        1. Thou Shalt Not Use A Computer To Harm Other People.
        2. Thou Shalt Not Interfere With Other People's Computer Work.
        3. Thou Shalt Not Snoop Around In Other People's Computer Files.
        4. Thou Shalt Not Use A Computer To Steal.

5. Thou Shalt Not Use A Computer To Bear False Witness.
6. Thou Shalt Not Copy Or Use Proprietary Software For Which You have Not Paid.
7. Thou Shalt Not Use Other People's Computer Resources Without Authorization Or Proper Compensation.
8. Thou Shalt Not Appropriate Other People's Intellectual Output.
9. Thou Shalt Think About The Social Consequences Of The Program You Are Writing Or The System You Are Designing.
10. Thou Shalt Always Use A Computer In Ways That Insure Consideration And Respect For Your Fellow Humans.

- Netiquette;
- ALA (American Library Association) – Core Values, Ethics, and Core Competencies;
- ACM (Association for Computing Machinery – Code of Ethics
- The Syndicate of Journalists of the Czech Republic – Code of Ethics;
- Association of Librarians and Information Professionals of the Czech Republic – Code of Ethics Czech librarians.

2. INFORMATION ETHICS IN EDUCATION

Information ethics in education includes all participants in the process of information transmission at this area. Three roles of people can be distinguished from the education point of view. This view leads to three ethics:

- Ethics of creators of information;
- Ethics of users of information;
- Ethics of information intermediaries.

The creators of information have the greatest moral responsibility. Their work can have an impact on the whole society. Their basic duties can be stated as follows:

- Not to disseminate information inciting hatred among people;
- Communicate truthful, non-misleading information;
- Reject half-truths and ambiguity;
- Ensure linguistic purity;

- Cite correctly;
- Write objectively, clearly and briefly;
- Avoid multiple publishing articles with the same content to avoid unnecessary increase in the volume of published documents;
- Not to write against own moral beliefs.

The users of information should have

- Search for the best information
- Information obtained when adequate need, use
- Accept also such relevant information which are unpleasant for them
- Use acquired knowledge for other people
- Cooperate with the addition and improving vague formulations

The provider (intermediary) has these duties:

- Respect the copyright
- Provide timely information
- Guarantee equal access to information
- Be responsible for the factual accuracy of the information provided.

In the next parts the concrete duties of teachers, students and supporting staff are specified.

2.1 Teachers

The basic tasks for teachers could be proposed as follows:

- To accept responsibility in making decisions consistent with the safety, health, and welfare of students, colleagues, and public;
- To disclose promptly factors that might endanger students, colleagues, public, or the environment;
- To avoid real or perceived conflicts of interest whenever possible and to disclose them to affected parties when they do exist;
- To be honest and realistic in stating claims or estimates based on available data;
- To reject information bribery in all its forms;
- To improve the understanding of technology; its appropriate application, and estimated potential consequences;
- To maintain and improve technical competence of students and colleagues;

- To seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
- To treat fairly students and colleagues;
- To reject all acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
- To avoid injuring students and colleagues, their property, or reputation by false or malicious action;
- To assist students and colleagues in their professional development;
- To support students and colleagues in respect of information ethics.

2.2 Students

The students are typically the users of information, acceptors of information, listeners and readers who have their specific rights and obligations. They are especially:

- Right to be informed;
- To have free access to information and free choice of information;
- To use information for their own development and to help others;
- Right for the confidentiality of information requirements.

2.3 Education supporting staff (manager, administrator)

Supporting staff (librarians, editors, publishers, translators, information professionals, web administrators, etc.) should take particular compliance with the following obligations:

- Respect the rights of authors
- Ensure equal access to all
- Withhold information only if it could be misused
- Intentionally distort the selection of information that could lead to a distorted perception of reality
- Not to apply their own moral principles
- Provide correct information and provide it in a timely manner.

3. QUALITY OF INFORMATION SOURCES

With the tremendous growth of information increases the need for distinguishing criteria. It is often difficult to distinguish between reliable information and manipulation, the sources of information can be serious but also absurd. Especially internet information sources can be sometimes problematic.

The ability to evaluate information belongs to the important skills in the world of information. Rating information, in terms of recognition and separation quality information, is one of the essential components of information literacy.

The process of quality assessment of information sources should evaluate:

- Target group of users;
- Content quality;
- Responsible person or institution;
- Exactness;
- Timeliness;
- Accessibility;
- Presentation and structuring;
- Ease of use;
- Comparison with other sources.

CONCLUSION

It seems that the topic of information ethics in the Czech education is still somewhat undervalued and overlooked. The same situation can be in other countries. It is a relatively young discipline but it is built on the long tradition of classical ethics, which tries to find an answer to how to work with information in an ethically correct manner in the contemporary society.

The goal of the text above is to focus on some hot questions connected with information ethics in modern education. The text is a brief view on a complicated area with many connections with should be carefully uncovered in the future.

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INTRODUCING SELF ORGANIZED LEARNING ENVIRONMENTS IN HIGHER EDUCATION AS A TOOL FOR LIFELONG LEARNING

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Abstract: *The profound changes that our society faces require continuous and thoughtful adaptations of the education system to the emerging demands of learning. Higher education is not immune to this reality. This article raises the need to lead a methodological change, renewing the traditional teaching-learning process. Self-Organized Learning Environments (SOLE) is one of the innovative teaching proposals to encourage learning in the society of Information requiring Lifelong Learning. Below, is a detailed methodological approach integrating the use of ICT with problem-based learning orientated towards the use of Personal Learning Environments (PLE) and SOLE according to the current social and educational demands.*

Keywords: Higher Education, Personal Learning Environments, Problem Based Learning, Lifelong Learning.

CHANGING PARADIGMS: NEW WAYS OF LEARNING

In the 21st century, we can say that technologies have changed the way we live, our customs and social habits. Converting the stage of humanity in a society of technology and information. For every society to develop, new members must be trained and taught to meet with social demand. While school is the institution that collects the desires and the social demand for building their future taxpayers, in theory it should evolve with society. However, the mere integration of ICT does not imply an evolutionary changes as the teaching methodology of many teachers remains similar to that of the twentieth or even the nineteenth century.

According to this new social, economic and cultural scenario, the development and infrastructure improvement led to emergence of a new set of technologies used in distance learning specifically in Virtual Learning Environments (VLE), primarily through the so-called virtual platforms or LMS (Learning Management Systems), with the inclusion of particular online methods for training (b-learning, e-learning

and m-learning), where classroom teaching was complemented by virtual spaces for training offered by educational institutions (Mikropoulos and Natsis, 2011). However, with years learning trends have been growing when the learning possibilities have increased. Outside school walls students develop new ways of learning and using knowledge; in fact, a new learning culture arises breaking classic boundaries of teaching within formal education. Thus we could affirm exist new ways and kinds of learning merging technological (new devices and tools, hardware and software) and teaching innovation (new learning methods, new ways of using devices and tools for teaching and learning). So we are attending to the birth of new learning approaches as stated Beetham, McGill and Littlejohn (2009) in Adell & Castañeda (2012):

- "Learning 2.0" (Downes, Anderson, Alexander, Walton),
- Counterevidence about 2.0. Learning (Redecker)
- Connectivisim (Siemens)
- Enquiry communities/learning communities (Wenger, Garrison & Anderson)
- Academic apprenticeship (Holme)
- E-learning & e-pedagogy (Mayes & Fowler, Cronje)
- Invisible learning (Moravec & Cobo)
- TPACK (Judi Harris, Koehler & Mishra)
- Creativity (Richard Gerver)
- Learning by doing (Roger Schank)
- Customized Education (David Albury)
- Rhizomatic Learning (Cormier)

Moreover, formal, informal, online and lifelong learning and the lately born: edupunk, edupop, incidental learning, ubiquitous learning… where the key idea is that with the introduction of ICT and mainly Internet in our lives, we could *learn at any place and at any time* (everywhere&everytime learning: EEL), which made us move from Formal Schooling Paradigm to Do It Yourself (DIY) (Gutiérrez and Mikiewicz, 2013).

At the same time, if we look at Spain's national legislation, we can observe that the necessity to renew teaching practise is underlined. In the Organic Law for the Improvement of the Quality of Education passed in 2013. We can find statements in the General Dispositions that confirm that the profound changes that our society faces requires continuous and thoughtful adaptation of the education system to the emerging demands of learning (*chapter III, Gral. Dispositions*). We need to create conditions that allow timely methodological change, so that the student is an active element in the learning process. Future and current students have changed radically

in relation to those of a generation ago. The impact of globalization and new technologies make the way they learn, communicate, focus their attention or even approach a task (*Chapter IV, Gral Dispositions*), different from that of their predecessors.

In 2006 the European Parliament and Council provides a definition of digital literacy that says, "Digital competence involves the confidents and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT: the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet". Furthermore, as argued by the Common Frame of Digital Competence (2013) digital competence can also be described as the creative, critical and safe use of information and communication technologies to achieve the goals related to work, employability, learning, time, inclusion and participation in society.

Taking into account, these frameworks in which all teaching practices must comply to, we find the sufficient justification to seek a new teaching proposal incorporating ICT as informational and productive elements of the teaching-learning process. In which the student is the master of his or her knowledge and architect to their learning. With the philosophy of Mitra (2010) and Self-Organized Learning Environments that are revolutionizing primary education, we have decided to take it one step further into Higher Education, entwine ICT policies and Piagetian Psychology Theory in order to favour Lifelong Learning.

1. LEARNING ENVIRONMENTS

1.1 Personal Learning Environments to Self-Organized Learning Environments

In recent years, the wealth of literature on personal learning environments has not left indifferent to those who work in initial teacher training, as they have emerged as the most influential training environment and facilitating the acquisition of new learning. This is mainly due to a confluence of factors such as the emergence of Web 2.0, the "democratization" of the Internet. The profusion in the use of social networks and interest, interaction with others, media, activities and tools, involvement in the learning objectives, the interaction between people that enables the creation and exchange of information and knowledge as well as the generation and transformation of that information into knowledge.

The PLEs (Personal Learning Environments) is a new approach to learning that facilitates the acquisition of digital competence and recognizing the existence of a personal Lifelong Learning environment (Atwell 2007; Adell and Castañeda 2010), "built and shared by other people who are part of our personal, professional and social environment of open, interoperable, low learner control (not the teacher or the institution" (Area and Adell 2009; 419)). For Rodrigues and Lobato (2013)

it is a personal learning space mediated by technological artefacts externalizing and related knowledge with other peers, connected to the same Web 2.0 space, run by personal rules that form and where multifaceted provides information intended to be shared, improved and established as a common good. Although the implementation of educational processes from and for a PLE is not produced by, the action of the tools used and activities carried out but of the teaching strategies used to achieve new learning (Urbina et. Al., 2013).

So to enable a collaborative networked learning and strengthen PLEs through the Personal Learning Networks (PLN) and the development of digital competence, the proposed work must necessarily pass PLEs transform virtual communities of learning practice (Rebollo et. al., 2012), establishing new training routes that will bring together the formal learning to informal (Palmero and Sánchez, 2013).

On that note, in continuum let us introduce Self-Organised Learning Environments (SOLE). SOLE refers to the adaptation of a school space to facilitate Problem-Based Learning. A teacher encourages their class to work as a community to answer questions using computers with internet access. SOLE's are created when educators encourage children to work in groups in order to answer motivational and curious questions. To do this there are certain parameters that should be met in order to create a SOLE in accordance with Mitra et. al. (2010):

- Students should choose their own groups.
- Students can look to see what other groups are doing and take that information back to their own groups.
- They can move around freely.
- They can change groups at any time.
- They can talk with each other and discuss with other groups.
- Participants have the opportunity to tell their friends what they learned after the SOLE.

In order to successfully undertake a SOLE activity, educators or monitors will:

- Get better at asking questions.
- Become more in tune with what children are most interested in.
- Feel connected on a more equal level.
- Expand their own understanding of what children can learn on their own.

In a school, or in this case higher education groups, such as seminars or workshops. They must:

- Encourage them to learn independent thinking and learning skills earlier
- Create a culture of curiosity and self-driven learning

- Experience more invigorated and interesting classroom activities.
- Offer more opportunities for both independent and collaborative thinking
- As well as, have fun.

With this mind-set, we hope to achieve a learning environment in which learners can pursue curiosities and learn either individually or collaboratively. Implementing a SOLE in the teaching-learning process should create a positive *ambience* in which learners are given the tools and the opportunity for Lifelong Learning. Negroponte & Mitra (2012) point out that:

> "*much of the world is discoverable, which is how we all learned from the time we were born until around age 5, when our formal education began. We interacted with our environments to acquire language and common sense. We acquired so much knowledge during those years that we learned many things about manipulating the world and even some about manipulating our parents. Suddenly, at age 5, our learning was assumed to be different and was delivered to us, almost solely through being told by people and soon after by books*".

2. METHODOLOGICAL PROPOSAL

As we have highlighted in previous paragraphs education today is in dire need of renovation and modernization. Education needs to be able to contend with the eventuality that if a child wants to know something they can simply take out their mobile phone and find it out within minutes or seconds. However, they need to learn more than mere concepts. Students need to learn how to learn and how to solve problems (procedures and attitudes) but they do not have to learn them sat in a classroom listening to the teacher, or looking at the chalkboard. We maintain that SOLE primarily rely on teamwork, where learning is an emergent phenomenon in the self-organization of the system.

One of the subjects in the Primary Education School Teachers Bachelor Degree from the University of Extremadura is IT Resources for Teaching and Research (from here on referred to as, the subject) which specialises in providing students digital skills as university students as well as its application to Education. With the SOLE implementation in the subject of the degree, the primary aim, as is collected in the study plan, is to help students "maintain an attitude of innovation and creativity in the exercise of their profession". Also knowing and applying innovative experiences in primary education. Besides knowing and apply methods and techniques of educational research and be able to design innovative projects identifying evaluation indicators.

Overall acquiring skills of using ICT as a tool and as an essential way to learn. With the implementation of SOLE, it turns out to be something more than a simple element to learn to learn, it becomes an epicentre of learning that connects the student with the world, propelled by the need to answer big questions.

2.1. METHODOLOGICAL DESIGN

As we mentioned in previous sections the SOLE is attractive for its logistical and pedagogical principles. Our methodological approach would be a pilot program in Teaching, Research and IT Resources subject. It will be implemented as a methodology of the current agenda.

The teacher should guide the subject content to "big questions" that encourages and invites students to solve. The questions must provoke curiosity and initiate long conversations. Due to the pragmatic nature of the question, each group could answer involving any disciplinary field for reference. After they have worked in groups, there will be a period of conclusions where each group should present their evidence to the others. So the groups in their computation, have built between them several content perspectives engaging with all of them and thus building their knowledge and using efficiently a set of resources, techniques and strategies of learning to ensure an autonomous, responsible and continuous learning throughout life.

The aims of this teaching experience are to:

- Design an intervention project in the classroom to introduce elements of the PBL methodology.
- Visualize other types of training (SOLE) that departs from the prevailing models today.
- Know the different methods and modalities that can be found when implementing a SOLE.
- Deepen the importance of PBL and SOLE in Higher Education.

The development of this methodological approach is carried out in three phases, which are:

1) Preparation Stage

We must find a suitable space to conduct a SOLE session. It should be an open space that gives the possibility for free movement as well as have sufficient Internet connection for ten computers for groups of three. We must also prepare the question to ask the learners, and try to predict where it will take them.

2) Stage Intervention

The stage includes the development of intervention of the SOLE Session. SOLE sessions, as states Mitra (2010) last approximately sixty minutes. Meanwhile, it is subdivided into three phases:

a) Introduce the Question

At this stage teacher has to explain the process of SOLE and distribute the roles of management and control (as in a SOLE session, student self-organize and regulate). Small groups self-organize in which they should appoint Manager to control and lead the group. Once the groups are ready, the teacher submits the big problem in

order to arouse the curiosity of the students and ignite their desire to discover. This phase should not last more than five minutes (With groups and roles established, the process of teaching and learning begins with the question, an example of a IT Resources for Teaching and Research subject question could be: *How would life be without technology?*).

b) Research

In this phase, the students have to start the academic adventure. In small groups, they begin the research phase. Students must locate, analyse and gather the information *they* consider necessary to resolve the problem. They have approximately 30 minutes. In the above example, students now seek the influences of technology in modern life, its functions, etc. In order to respond adequately to the question they would have to come up with their justified conclusions about what life would be without technology. This question can be pursued by various discipline branches (When we have more groups or the more flexible the question, we more likely to have a variety of responses).

c) Review

This should take place in a big group area, in which each group presents their findings summarizing what they have learned and their own conclusions. This phase could generate a debate on the subject or the information collected. At the end of the session, the students should reflect on what they have done in the SOLE and what to improve (both learning and behaviour). This phase should last about fifteen minutes.

3) Evaluation Stage

The last stage of any learning design is the evaluation. This is where we must evaluate whether the SOLE's are effective in Higher Education. This will make various evaluation tests:

1) Diagnostic assessment.

2) Co-evaluation and self-assessment activities with rubrics.

3) And finally, a SWOT analysis in which we can collect opinions and assess the teaching-learning process from a students' perspective.

FINAL REMARKS

As it has been stated all these new learning scenarios help to configure and describe (at the same time) how the *New Millennium Learners* learn, think, use and apply to their lives and ways to interchange virtual and real life. Underpinning the issue of relation between formal education and learning, informal education and learning and online education and Lifelong Learning, as the concepts that are being presented by young people.

In order to achieve the millennium objectives for education, we need to take action. By using SOLE and these Web 2.0. integrated activities, students are developing their research skills and their problem solving abilities. They are also indirectly learning to collect data and use IT tools to express it in many different ways, as well as digitally alphabetizing themselves, working in groups and most importantly, being the centre and main actors of their learning process. With this, we hope to contribute to Lifelong Learning in digital environments. As well as training future teachers on how they can renew education practices using ICT as an ally in the teaching-learning process.

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MANAGEMENT OF GROUPS IN DISTANCE EDUCATION

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Abstract: *A learning group is a concept which is commonly known and used in education. This article presents the issue of managing learning groups on e-learning portals. The authors point to similarities and differences in realization of the group concept in traditional and distance education. They present the technical options offered by LCMS portals for creating and managing groups, together with an overview of tools available to members of a distant group. They indicate the availability of work environment creation function in a D-learning portal for small project groups, with a separate set of group work tools. Knowledge in the field presented in the article can be used as selection criteria for choosing a functional portal for an education unit.*

Keywords: education group, project group, management of groups, distance education, wiki, e-learning portal, LCMS

INTRODUCTION

Learning group management is an issue which will definitely occur when teaching distance classes (Pulak 2010, Cholewa, Psiuk 2010). Despite that the concept of a group is commonly known, the group mechanism on e-learning portals is

underestimated and will not always be fully employed in distance learning. The authors' experience shows that mapping the concept of a traditional learning group to a distance learning group is not always comprehensible for knowledge suppliers and organizers of distance learning. The article was created in order to introduce the issue of managing distance learning groups, to emphasize its extremely important role in D-learning and to position it within the entire e-learning landscape. It shows the corresponding elements of group work during a local class and a distance class, and presents tools available only to a distance class. Knowledge in this field may inspire new approaches to ways of teaching a distance class and help an educational institution choose or change their e-learning portal. It is recommended to review the documentation of the implemented portal in this respect and see how the authors of the application (D-learning portal application) realized the functionality of learning groups.

1. CHARACTERISTICS OF LEARNING GROUPS

A learning group plays an important role in teaching distance classes and its good implementation in a portal ensures successful proceeding with e-learning classes and good learning organization. In distance learning, a learning group consists of the given learners' community. Learners (knowledge recipients) may belong to different groups created for the purpose of proceeding with the classes:

- lecture groups;
- practical class groups;
- seminar groups, etc.;

or, they can be members of groups formed during the given stage of learning among members of their group or different groups, such as:

- project groups;
- topical groups, which may comprise members studying in different years but participating in the same course;
- groups formed by individuals who register for optional classes, etc.

Obviously, grouping refers to other participants of distance learning as well, i.e. to knowledge providers, for example a group of teachers of the given course or the given topic.

Some learning portals offer the options of grouping learning groups into larger units of organization, which are called learning areas. A learning area naturally corresponds to year of study in traditional education. It facilitates group administration if there are many groups on the given level of study.

Formation of such units is supported by study resources being shared across the portal by multiple groups at the same time. An example of practical implementation

of learning areas can be the access to the same learning materials for two course groups taught by different professors. Similarly, a learning area occurs when the same course is taught by a single professor in different fields of study.

The article focuses on the issues involving learning groups with knowledge recipients being the members.

1.1 A group in traditional learning vs. distance learning group

Every learning group is characterized by the following common features:

- it performs common tasks,
- it uses shared resources,
- its members communicate with each other.

If one views a learning group in traditional education, one can see that a group has a teacher or teachers, defined members, subjects/topics covered within a specified time, agreed tests and exams, shared learning materials, joint projects to cover, and common challenges it has to face during the term of learning. All information regarding the given group will only be communicated to its members by way of information from the teacher, or year coordinator (or any other person from the teaching circle), or by members of that community themselves. Group members collaborate through achieving group tasks, or create sub-groups (teams) within the learners' community.

The process of user authorization in a distance learning portal offers the possibility of grouping the learners in different configurations (Roszak, Kołodziejczak, Kowalewski, Ren-Kurc 2013: 339). A distance learning group realizes elements of a traditional learning group with collaborative tools (see Figure 1) that can be assigned to the group in the portal or through course elements (e.g. directory, wiki, podcast, blog, forum, file dialogue, e-mail, calendar), after determining visibility and access to these elements for the given learning group or learning areas. Visibility and access to different tools and activities, read or write permissions are dedicated to the group and not to individual users. Therefore, definition of a group in distance learning is a foundation for proper execution of classes.

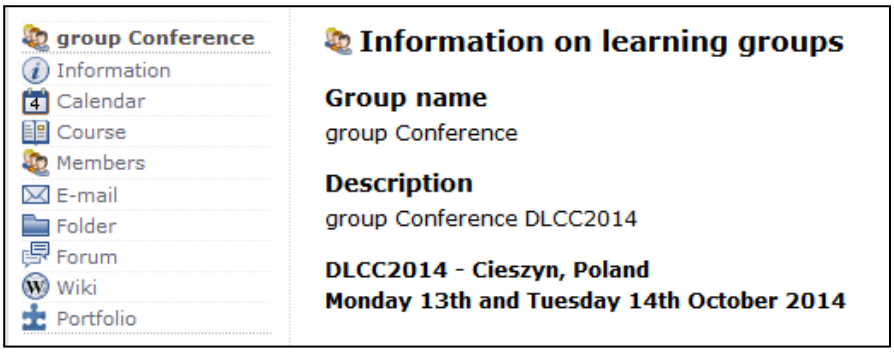

Figure 1. Example of learning group in Online Learning And Training portal (OLAT)

Source: own work

1.2 Realization of a learning group in an e-learning portal

The authors suggest to see how elements typical of a learning group are realized in a distance learning portal:

1. Group members with assigned teachers (see Figure 2) will be imported from file to the portal before commencement of class, or created during the first local meeting by the participants themselves (using Enrollment tool available within the course). The second option is an interesting functionality you will not find in a traditional group. Group members can see each other and their tutors.

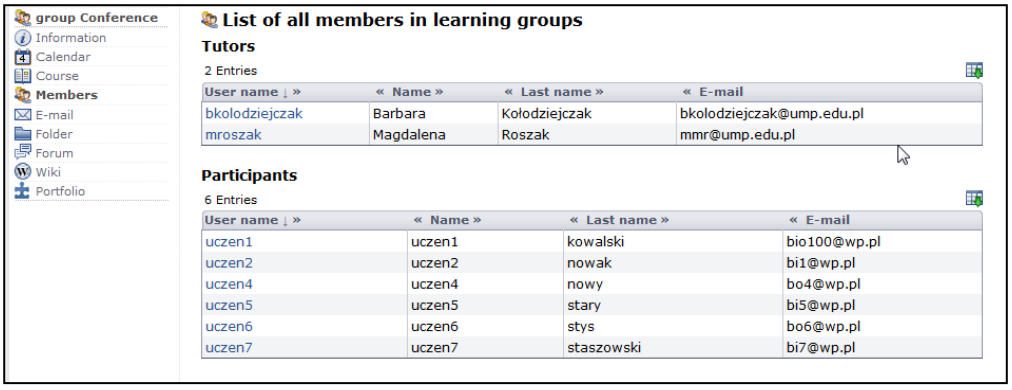

Figure 2. List of members in learning group in OLAT

Source: own work

2. The group and not an individual has the right to use the given learning resources at the given time in the portal, including courses, tests, surveys, thematic forums, etc. (see Figure 3). This is often disregarded, while in fact there is an analogy to traditional classes which will be adapted to the group of learners.

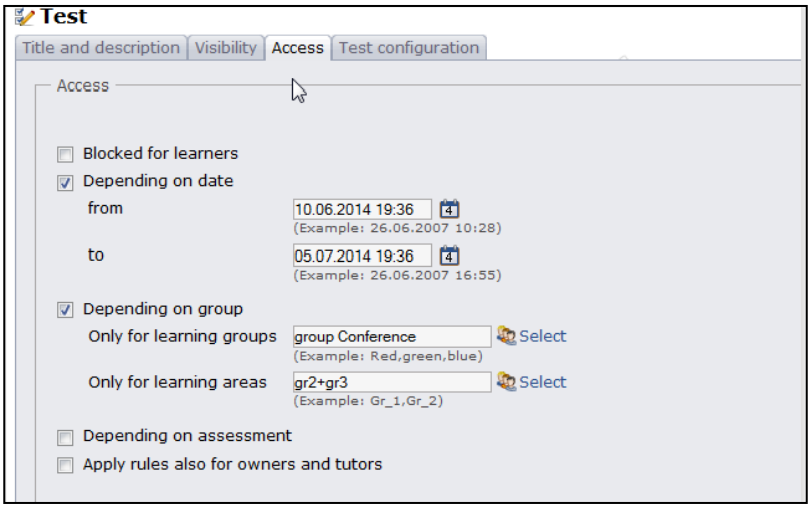

Figure 3. Parameterization of test in OLAT

Source: own work

3. Calendar is a tool allowing the group to keep a joint schedule of events. The course tutor will typically use it to record certain deadlines related to the teaching process, while each user can view them in their private calendar where they can add their own important dates. Participants may add entries if this permission is granted to the group by the teacher. This functionality is rarely used in traditional learning. A group member may also be a member of another learners' community and then they will see more than one calendar in their portal account. Figure 4 shows a calendar with deadlines for 6 different groups constituting a single learning area for the subject of Pathophysiology.

Figure 4. Calendar in OLAT

Source: own work

4. Communication within the group usually involves sending e-mails in the portal to all or certain selected group members (see Figure 5). This can be done by both teachers and members of the group who may write to the group, ask questions or ask for additional explanations. The difference between this option and traditional e-mail communication is that there is no need to create a separate contact group in the e-mail client to communicate with the group, as it is accessible in the portal (Roszak, Kołodziejczak, Kowalewski, Ren-Kurc 2013: 340).

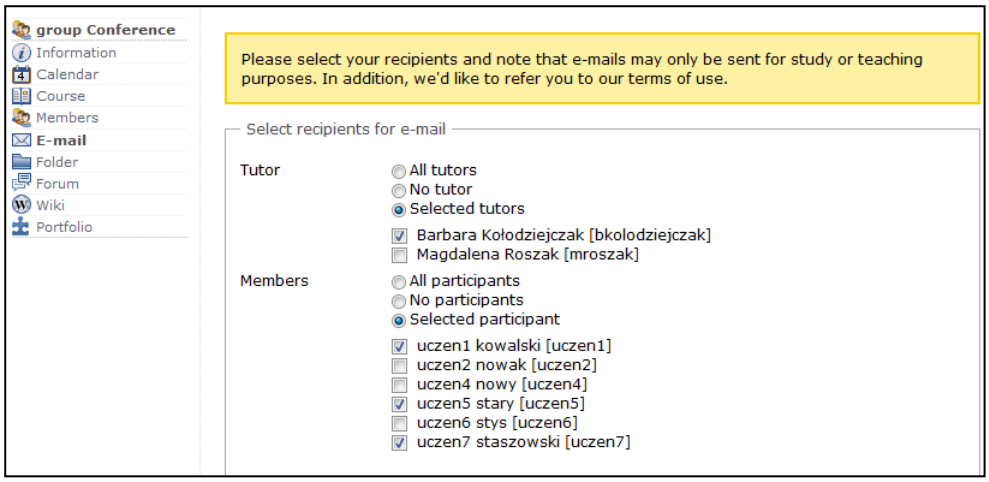

Figure 5. E-mail in learning group in OLAT

Source: own work

The tutor can also leave a message for the group using the Information option (see Figure 6).

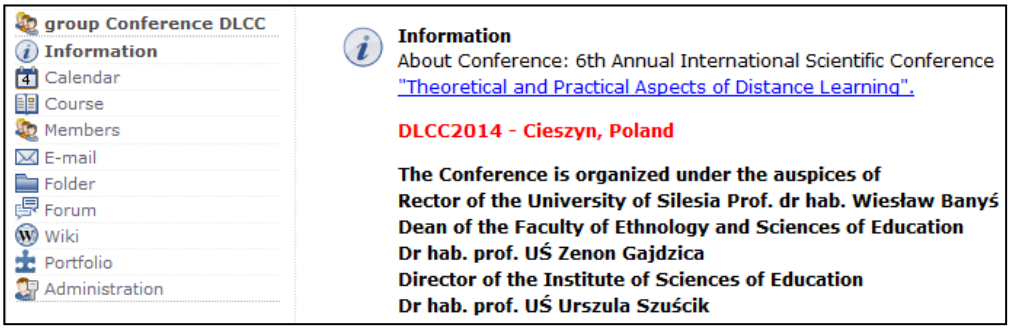

Figure 6. Information in learning group in OLAT

Source: own work

5. The tutor or another member of the teaching community may give organizational information to the group or messages about the course of study on the group forum (see Figure 1, 2). Subject-matter issues should be discussed in the course forum, which is the place for work and sharing topic-related information. The available forum allows every group member to view the problems of the learners' group, gives the opportunity of coordinating the learning process and eliminate the need for the teacher to answer the same question repeatedly.

6. A file repository (see Figure 1) is a place where group members may gather their electronic resources and share them without using e-mail, which is standard procedure in traditional learning. Using a shared folder is convenient and easy.
7. Wiki allows joint work on projects, sharing knowledge and communication between the group and the teacher. This tool is rarely used during a traditional class. For more information about wiki, see Chapter 2.3.
8. E-Portfolio (see Figure 1) is where group work can be documented, its achievements can be reviewed and further team work can be scheduled.
9. Archiving learning deliverables in the portal involves automatic gathering of files from jobs completed by learners, tasks, activities and projects, which are saved in folders according to group allocation (see Figure 7).

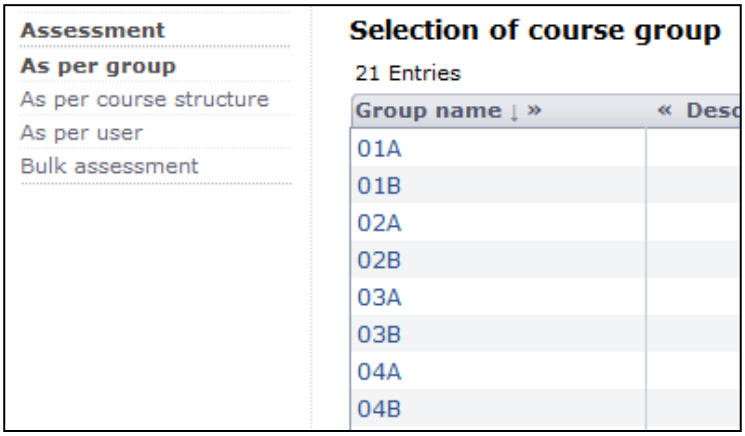

Figure 7. Assessment tools in OLAT

Source: own work

In conventional learning, students e-mail files with completed tasks, which is very inconvenient for the tutor teaching several groups at a time and having to receive a large volume of messages with attachments, which are not always properly identified and must be sorted manually. Then, the teacher has to save the jobs on his own storage media and confirm receipt to the sender (Roszak, Kołodziejczak, Kowalewski, Ren-Kurc 2013: 340). With the function of gathering the jobs in the portal, the application will take care of the above mentioned duties automatically. Work results are structured in directories which can be easily reached through selecting a given group of students (see Figure 8). At the same time, you can create various reports, summaries and statistics.

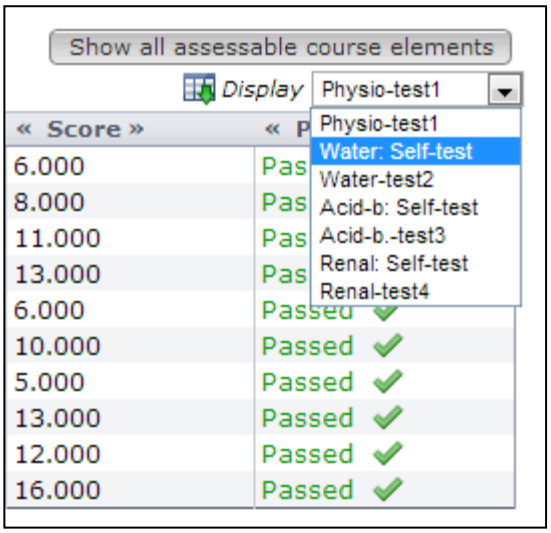

Figure 8. Assessment tools per group – tests in OLAT

Source: own work

1.3 A group in distance learning - summary

A tutor often teaches more than one learning group at a time, e.g. he teaches a course for several different groups, or on several different levels of advancement. The learner may also be a member of several groups as they participate in various courses, particularly elective courses held independently of the field or year of study.

Therefore, the following are available in distance learning:

1. A single course for multiple learning groups (e.g. group Ia, Ib, Ic),
2. A single group with several courses assigned (e.g. biostatistics, pathophysiology, biophysics)
3. A single learner being a member of several different groups (e.g. biostatistics, Ia, computer science-optional) or a member of a learning area (see Figure 9) formed by different groups (e.g. students of the Faculty of Pharmacology).

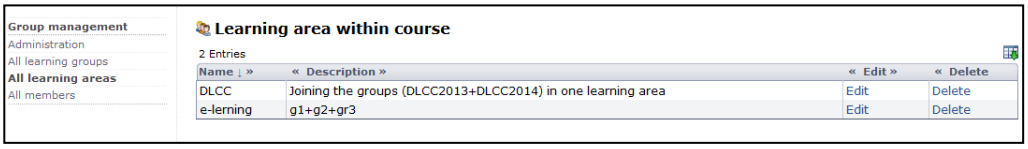

Figure 9. Learning areas in OLAT

Source: own work

4. In distance learning, there is also the concept of a learning context, which is a set of learning groups and/or learning areas with access to one or more courses (see Figure 10).

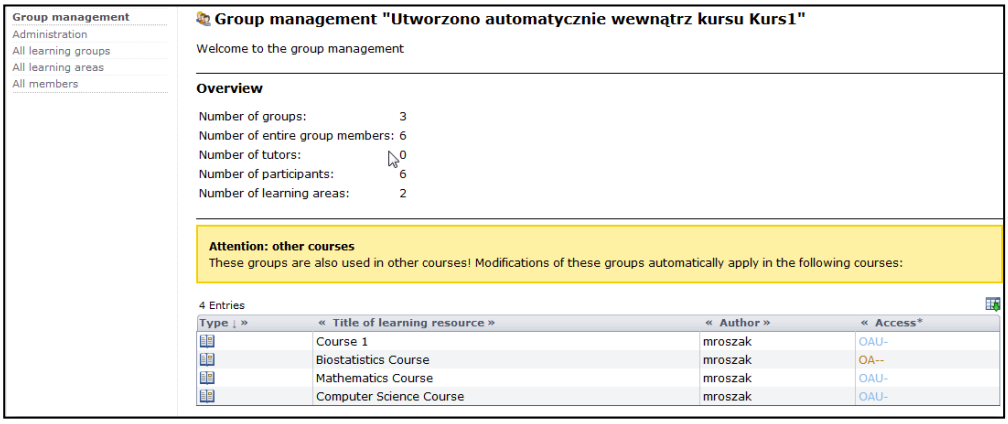

Figure 10. Group management in OLAT

Source: own work

The ability to create and manage learning groups is therefore a very important aspect of distance learning, and every teacher or e-learning organizer should have advanced competences in the field. Inability to use group implementation mechanisms causes distance teaching to consume much more time than conventional teaching, discouraging the teacher from these methods of work as a result. Without effective group mechanism implementation, a portal will have poor efficiency; therefore, the functionality of managing learning groups should be among the selection criteria.

From the viewpoint of a distance learning participant, membership in a group gives a feeling of belonging to the learners' community and offers tools to facilitate working with the portal, communicating with the tutor and other group members. In addition, portals can be used to create shared work areas in a small team, i.e. a project group.

2. PROJECT GROUPS

2.1 Creating a project group

A project group created within a course is a group dedicated to perform certain specified tasks. Usually, it has a tutor to moderate its activities. Furthermore, learning participants may be free to organize themselves in unsupervised groups. The purpose of offering such structure in an LCMS portal is, for example, to be able to implement a group project, to share knowledge, or to communicate in small groups working on the same subject.

Not all LCMS portals implement project groups, e.g. Moodle. OLAT (Online Learning And Training) supports project group realization, offering tools for creating and managing them and for group work. Members of a project group can be selected course participants. Group selection can be done on the administrative level, i.e. individuals can be assigned to specific groups by the course teacher or administrator. Another way of assigning participants to a project group is when a course participant creates his own group and suggests members. The group creator is also the owner. He has administrator privileges, i.e. he can freely add and remove group members (see Figure 11), or decide about the tools available to the group. A member of a project group may withdraw from the group at any time.

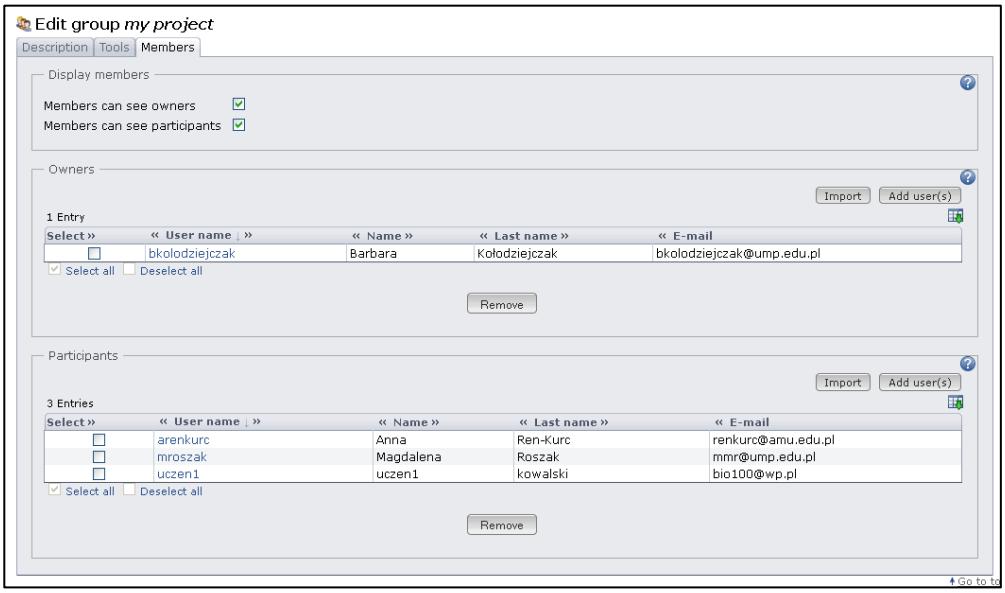

Figure 11. Members tab in administration panel in OLAT

Source: own work

2.2 Project group tools

An important aspect of a project group's work on the portal - like in the case of any other learning group - are the team working tools available to the group. A creator of a project group may assign the following collaborative tools to the group (see Figure 12):

- information for group members,
- contact form,
- calendar,

- directory,
- forum,
- Wiki,
- e-Portfolio.

Chapter 1.2 discusses the functions of each of the above mentioned tools in the distance learning process.

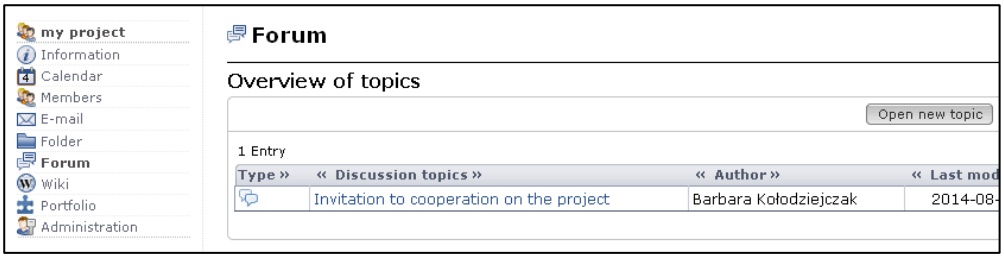

Figure 12. Tools for project group in OLAT

Source: own work

The choice of tools available to a project group may affect the manner of collaboration within the group, communication among members, and effective flow of information. This is particularly important if the group collaborates only in distance mode and its members live in distant places.

2.3 Wiki as a group work tool

Wiki is an important element of a project group's work. Wiki is a type of website that can be created on the browser level, typically using a HTML tag editor (Wikipedia, http://en.wikipedia.org/wiki/Wiki). The tool was created by Ward Cunningham in 1994. You can use wiki for knowledge creation and sharing (Wrycza-Bekier 2012: 45-47 as well as for communication between users.

A Wiki can be created directly within the course, or imported to the course from outside. The latter method involves prior preparation of wiki resources, not necessarily by the course author. If wiki is used as a project group tool, pages are created by group members on an ongoing basis. Every group member is able to read articles published on wiki, modify them or add new pages of his own (OLAT 7.8 User Manual, http://www.olat.org/images/olat/downloads/manuals/help_en.pdf). Only the creator or registered owner of a wiki page can delete a page. These permissions can be changed in this course element setup.

A wiki element has its own home page (Index), navigation menu and tabs, for creating and modifying existing pages or for starting a discussion. Page contents may include formatted text (colour and font change), images, mathematical expression, audio files, links to local server resources, external resources, and

references to other pages of the given wiki (see Figure 13). From menu level, you can view a list of all available wiki articles.

Figure 13. Index page of wiki in OLAT

Source: own work

Wiki pages can also be the discussion place within a group of users (Mokwa-Tarnowska 2014: 36). New threads in a discussion are created in the same way as in the forum (see Figure 14). You can add a file to discussion content, e.g. containing lecture materials, example applications, calculations in a spreadsheet, etc.

Threads within a discussion are sorted by default according to the last modification time, and the most recent threads are at the end of the list. This order can be reversed. A list of all threads shows information about the type, name, author, last modified date, etc. The portals also offer options for archiving threads, i.e. storing them in a private directory, closing threads to end the discussion, or hiding threads so that they can be viewed by the author only. Thread archiving options can be a source of documenting the group's work on the portal.

Because a wiki can contain both pages with content and discussion threads, it is a perfect place for building and developing ideas while working on a project. On the one hand, it allows you to gather contents already developed, and on the other hand it can be used for brainstorming ideas still requiring development. Wiki can be used both for communication among project group members and for consulting the teacher or project supervisor.

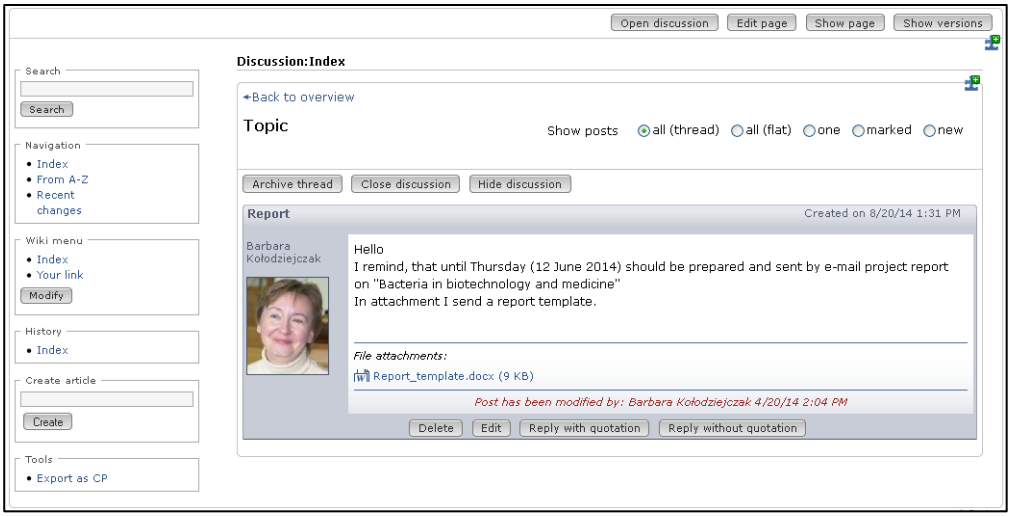

Figure 14. Post in a discussion on wiki in OLAT

Source: own elaboration

The portal allows the tutor to control group members' activities through displaying detailed information about the number of posts and comments added and threads started. In addition, wiki can be subscribed through RSS feed. With such subscription, group members will receive wiki updates, i.e. new articles and discussion threads (Pałka 2012: 40).

CONCLUSIONS

Management of learning groups is an important part of any course on an e-learning portal. Therefore, the authors believe that this aspect should influence the choice of the LCMS portal for an educational institution as well.

Easy creation and handling of groups, i.e. dividing them into smaller units or merging if necessary, may help efficient course organization.

For teachers of distance classes, an important aspect is the ability to archive course data automatically (test results, final papers, evaluation questionnaires, etc.) divided by group, leaning area or project group.

In the learner's perspective, membership in a group gives him access to information, calendars and other shared resources. A set of available closed tools guarantees ideal conditions for collaboration and communication between members. The ability to divide a learning group into smaller teams, i.e. project groups, is an important functionality of an e-learning portal. It facilitates managing projects and final papers in small study groups.

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STUDENTS' EXPERIENCES IN THE MANAGEMENT OF THE INFORMATION AND EDUCATIONAL RESOURCES IN THE TRADITIONAL AND DIGITAL PERSONAL LEARNING ENVIRONMENT

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Abstract: *The modern student is functioning in two learning environments, the traditional and the digital. Both areas complement each other, but the importance of the virtual space used for educational purposes is steadily increasing. There are new technological tools which enable to use advanced e-learning and blended learning methods.*

The article presents the results of a diagnostic research on the possibilities of building an educational environment by the students. This paper describes the most commonly used traditional and digital educational resources. The research results show the experience of students in the field of organizing and managing educational resources in both traditional and digital personal learning environments . It also presents ICT tools most commonly used by students in organizing their own learning environment and describes the habits associated with the collection and storage of information.

Keywords: learning environment, personal learning environment, virtual learning environment, information organization, information competencies, digital competencies.

INTRODUCTION

The last twenty years have seen great changes in the virtualization process of education. Development of modern technologies, especially the Internet, made possible for the educational environment to implement new resources and digital tools. Books, textbooks and educational materials are available not only in the traditional form but they appear more frequently in the digital format, in the form of e-books or audiobooks. The availability of educational resources for mobile devices

(tablets, smartphones or iPads) through the use of Internet networks enables the interested party to learn anywhere, anytime.

1. THE DIGITLIZATION OF THE EDUCATIONAL ENVIRONMENT

Just after the first personal computer appeared specialists started putting efforts into using it for educational purposes. The first interactive learning computer software appeared as well as educational video games and multimedia publications. Contemporary products in this field are abundant and diverse. Today, the Internet plays an essential informative and communicative role. Advanced e-learning systems have been developed that enable remote learning and fully personalize the learning environment. Apart from the communicative capacity, the Internet supplies resources and tools which build the space for a wide range of learning activities.

1.1 Learning environment in XXI century

The transformation of the traditional learning environment into the modern environment based on technology is best reflected in the *21st Century Learning Environments* developed as part of the *The Partnership's 21st Century Skills Framework.*

The term "learning environment" suggests place and space – a school, a classroom, a library. And indeed, much of the 21st century learning takes place in physical locations like these. But in today's interconnected and technology - driven world, a learning environment can be virtual, online, remote; in other words, it doesn't have to be a place at all. Perhaps a better way to think of the 21 st century learning environments is as the support systems that organize the condition in which humans learn best – systems that accommodate the unique learning needs of every learner and support the positive human relationships needed for effective learning. Learning environments are the structures, tools, and communities that inspire students and educators to attain the knowledge and skills the 21st century demands of us all" (*21st Century Learning …,* 2007).

On the other hand, the term personal learning environment (PLE) specifically emphasizes the individual aspect of consciously creating personal learning environments. In the PLE definition it is described as systems that help learners take control of and manage their own learning as usually incorporates three basic elements

1. set learners own learning goals;
2. manage their learning, both content and process;
3. communicate with others in the process of learning (Wikipedia 2014).

The learner develops and creates their own learning space. They choose, gather and arrange sources and resources. The idea of PLE emerged with the notion that the

learning process takes place in different contexts and situations, specifically informal, not coming from the institutional actions but making learning possible at home, or work by solving problems by interacting with others. The basic element that shapes the environment is the ability to make personalized choices, personal preferences and the motivation of the learner (Attwell 2007; Downes 2009; Kompen, Edirisingha, Mobbs 2008).

The idea of PLE is that the learner is in the centre of all actions, according to one's inclinations the learner adapts available methods and tools to learning needs. In the narrow sense, PLE is a set of technologies, tools and applications which facilitate activities connected with the learning process. It is based on creating a platform or a starting point on the web which leads to numerous other applications and web services used in the learning process. By definition it refers to the notion of "personal web" understood as a set of tools and technologies used for the individual configuring of settings and managing the use of web (Horizon Report 2009).

1.2 Competences in the scope of the management of the digital personal learning environment

In order to effectively move around the digital space and use the available tools in the personal learning environment it is essential to possess appropriate competences. Digital literacy can be interpreted as „the awareness, attitude and ability of individuals to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesize digital resources, construct new knowledge, create media expression, and communicate with others, in the context of specific life situations, in order to enable constructive social action; and to reflect upon this process" (Wan Ng 2012; Martin 2005).

The digital literacy competences are abundant and can incorporate areas such as:

- photo-visual literacy (learning-to-read from visuals);
- reproduction literacy (use of digital tools that have capabilities to edit or combine digital materials- text, audio, video, images);
- branching literacy (the use of hypertext and hypermedia in creation of non-linear media of information, the ability to the navigate through information resources);
- information literacy (the ability to search, locate and assess web-based information);
- socio-emotional literacy (social aspects of online socializing, collaborating) (Wan Ng 2012).

From the perspective of organizing knowledge the most useful competences prove to be the information competences. In the developed American Library Association Information Literacy Competency Standards for Higher Education the authors emphasize the skills connected with managing the information environment

(American Library Association, 1989; The SCONUL Seven Pillars …,2011; Information Literacy Competency …, 2000). The table below (table 1) shows related individual standards and skills.

Table 1.

Competences connected with managing the information environment

Standards	Competency
Searching for information in available resources	Familiarity with basic and advanced search tools
	Using content aggregating systems (feeds and RSS readers) to find current data, follow information published within a specific discipline or issue
	Archiving information (creating own information resources, bookmark lists and link to articles, web pages, databases etc.)
managing the content - organizing, categorizing and ordering information	Tagging (creating a system of personal tags, using the Social Bookmarking service)
	Using applications and services for managing works cited (Zotero, EndNote), creating databases of personal resources, organizing, creating theme catalogs, automatically downloading information form works cited databases, creating quotes and note databases
Communicating and sharing content with other participants of the learning process	Using basic communication tools (e-mail, Internet communicators, VoIP services)
	Participating in discussion groups and forums or commenting on web pages and blogs

2. MANAGEMENT OF THE TRADITIONAL AND DIGITAL INDIVIDUAL LEARNING ENVIRONMENT

2.1 Goals, issues and methodology

The purpose of the study was to determine the manner in which university students organize their individual learning environments, what tools they use and how efficiently they use virtual space. The level of knowledge management in the modern information-communication technology is one of the fundamental indicators of information competences of the young generation. High level of skills allows for creating an advanced digital learning environment, building the foundations for life-long learning.

The study was of diagnostic character and the main study problem was formulated as follows: How do pedagogy students organize the information resources and educational content in the traditional and digital personal learning environment?

Detailed research problems included answers for the following questions:

1. What traditional and digital sources of information do students use in the individual learning process?

2. What tools and services do students use to organize and store information in the traditional and digital form?

3. What tools do students use to communicate for learning purposes?

4. Do the students shape their learning environment in a conscious and planned manner?

For the purposes of the study a special survey was prepared which was available from the 15th of October 2013 to the 14th of March, 2014 in the form of an Internet form. There was a total of 290 participants in the survey. They survey was conducted among the students of the Cracow universities studying social sciences and liberal arts at every stage of academic education, including Bachelor's Degree programs (219 participants), Master's Degree programs (60 participants) and postgraduate studies (11 participants).

2.2 RESEARCH RESULTS

2.2.1 Sources of information and methods used for searching for information in the traditional and digital personal learning environment.

The fundamental element of the learning environment are sources of information. Traditional sources of information used in the learning process are textbooks, tutorials and other printed materials such as encyclopedias, lexicons, dictionaries and studies prepared by lecturers. Their usage level is shown in Figure 1.

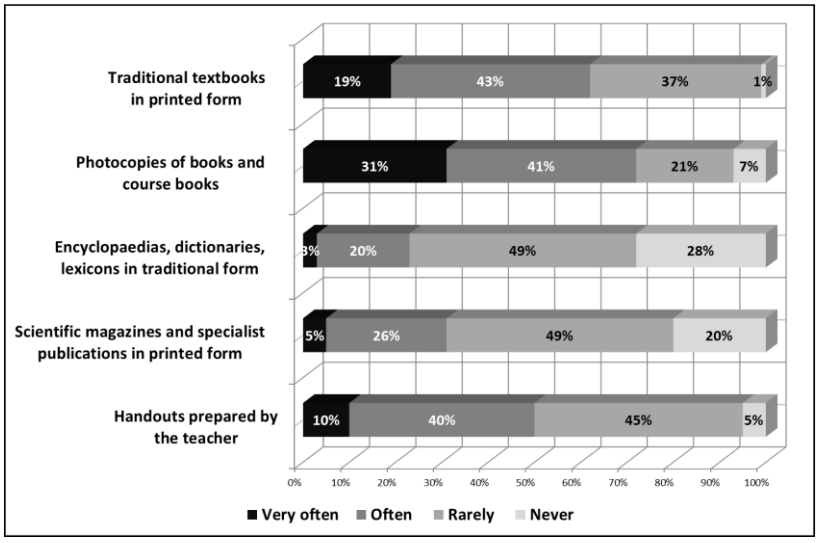

Figure 1. Using traditional sources of information in the individual learning process

Source: own research

The collected data shows that traditional printed textbooks are still very popular among contemporary university students. Over half of the respondents (62%) use them frequently or very frequently. Most likely problems with availability make the students choose photocopies of books and scripts (72%). To justify their choice, the students said it is because photocopies make taking down notes and underlining passages easily, and it is convenient to gather and store them.

Another important source of information in the learning process (50% of respondents use it) are printed materials prepared by the lecturers. Less likely would the respondents choose in the individual learning process traditional printed encyclopedias, dictionaries and lexicons (23%) and specialized magazines (31%).

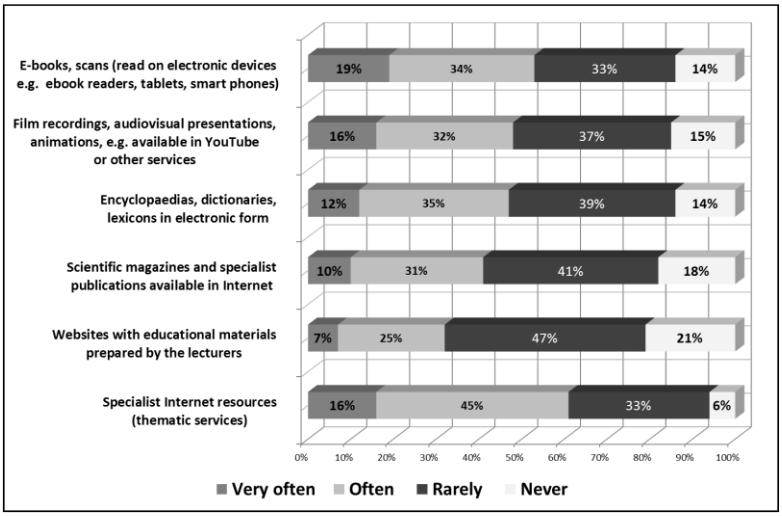

Figure 2. Using digital sources of information in the personal learning process

Source: own research

Among the major digital sources of information used by the respondents are freely available specialized Internet sources (Figure 2), with content corresponding to the subject of learning. Frequently or very frequently they are used by over half of the respondents (61%). A little fewer people admitted using books and textbooks in a digital form (53%). These are usually publications in the pdf. format. It is an universal format used in most mobile devices. As the respondents emphasize, the main advantage to the electronic learning materials is the ease of using netbooks, tablets, e-book readers and even smartphones.

Using audio-visual materials (photos, videos, animations and simulations) in the individual learning process is on a similar level. Only 15% of the respondents said that they have never used multimedia resources for learning goals. Due to the development of services like YouTube, the availability of didactic materials has risen. Academic lecturers are using new media more frequently to supplement traditional didactic aids. Students respond well to these actions. Teenagers are used

to this form of receiving information, mostly by the media, eagerly choose video tutorials or recordings of lectures.

Specifically, the process of digitalization of the learning environment can be seen on the example of studies such as encyclopedias, lexicons and dictionaries. The respondents indicated that they more frequently use electronic versions of the learning sources due to their mobility and ease of use. Generally, online encyclopedias and dictionaries are used by 86% of the respondents and their printed counterparts are used by 72%.

An important part of the learning process is looking for information. Traditional sources of information in the age of virtualization of social life still have their role to play, however their significance is declining (Fig. 3). About 76% of the respondents admitted using printed textbooks and books quite frequently. They seek answers from lecturers and colleagues equally (79%). It is good to see that 64% of the respondents, representing the generation of digital natives, perceive the library as one of the most important sources of information.

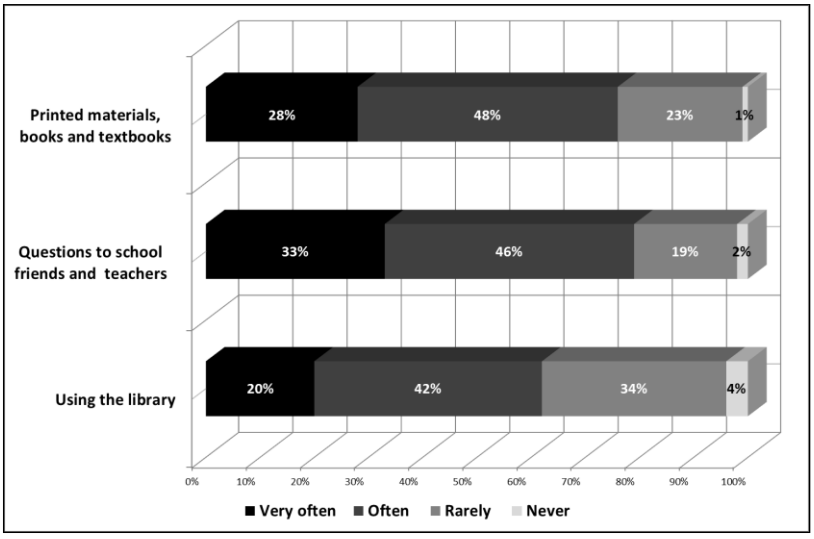

Figure 3. Methods of seeking information in the traditional individual learning environment

Source: own research

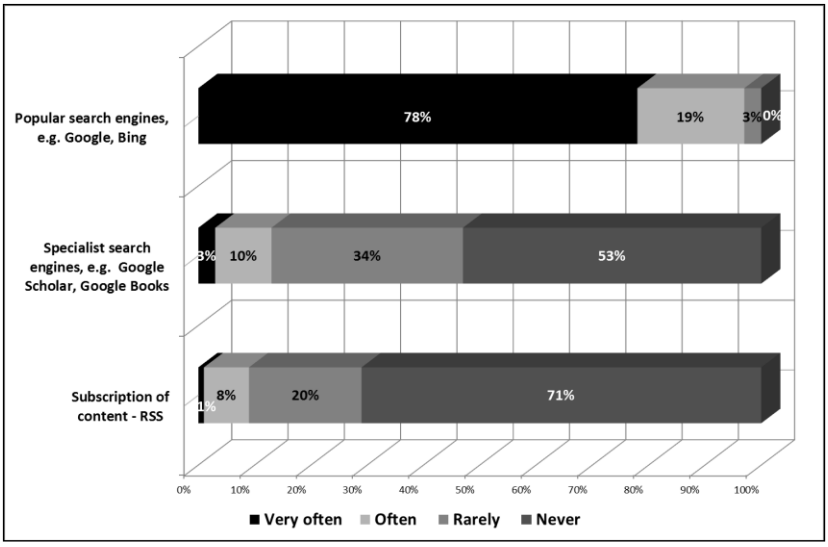

Figure 4. Methods of seeking information in the digital personal learning environment

Source: own research

In the digital learning environment every respondent uses the most popular search engines such as Google or Bing (Figure 4). They are sadly the main and fundamental tools which the students use seeking information.

In this context it may worry that only a small number of respondents used specialized and advanced search tools (only 48%). It may be connected to the lack of knowledge about the availability of tools and the inadequate information competences which the respondents represent.

2.2.2 Tools for collecting and managing resources in the traditional and digital learning environment

Methods of collecting, managing and storing information in the traditional and digital environment used by students are shown in the three consecutive charts (Figure 5, 6, 7).

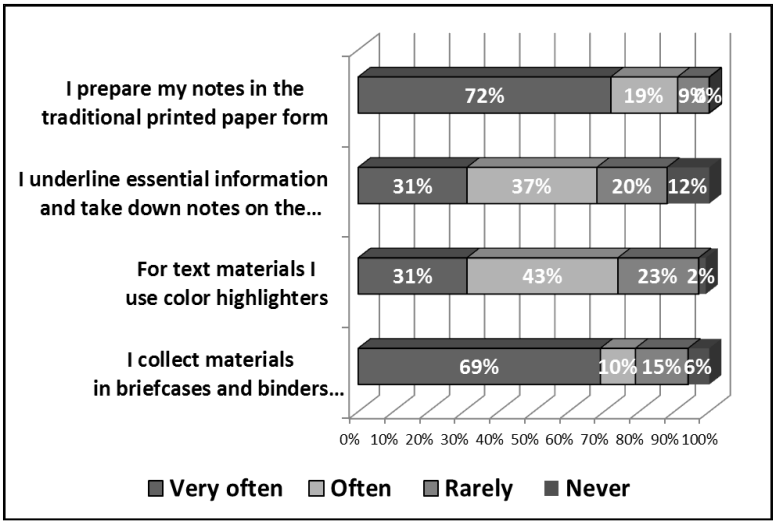

Figure 5. Methods of storing and organizing information in the traditional learning materials

Source: own research

Traditional ways of taking down notes are used by all respondents, however 9% of the respondents use them rarely. The respondents organize their notes using color underliners and bookmarks in briefcases and binders, often arranged by subject (ex. subject name or title of the contents). Contemporary students still enjoy taking down notes and supplements on the margins of books and printed materials.

These habits are then transferred to the digital environment. As much as 97% of the respondents create subject folders on their computers, attempting to arrange documents topically or chronologically, according to their creation date.

Worth noting is the widely used means of recording information in the form of photos. It was used by about 64% of the respondents. In their comments the respondents stated that it is a convenient form of remembering plans and figures displayed by the lecturer on the table or illustrations in books or studies. One can even use the camera in their phones exclusively or other mobile devices which are currently owned by everyone.

Nearly 47% of the respondents admitted using playlists for storing multimedia materials because it is easier to categorize and arrange the materials thematically. It is easier to find them in your own resources.

Only a small percent of respondents take notes in the form of audio recordings. Only 15% of the respondents use voice recorders, often built in the phone.

Generally, over 64% of the respondents prepare their notes on mobile devices such as netbooks, tablets, smartphones, where about 24% of them do it frequently or very frequently. The rest prefers traditional forms. What is interesting is the nearly non-

existent interest in the widely available, but rarely used, professional applications for managing notes such as Microsoft OneNote.

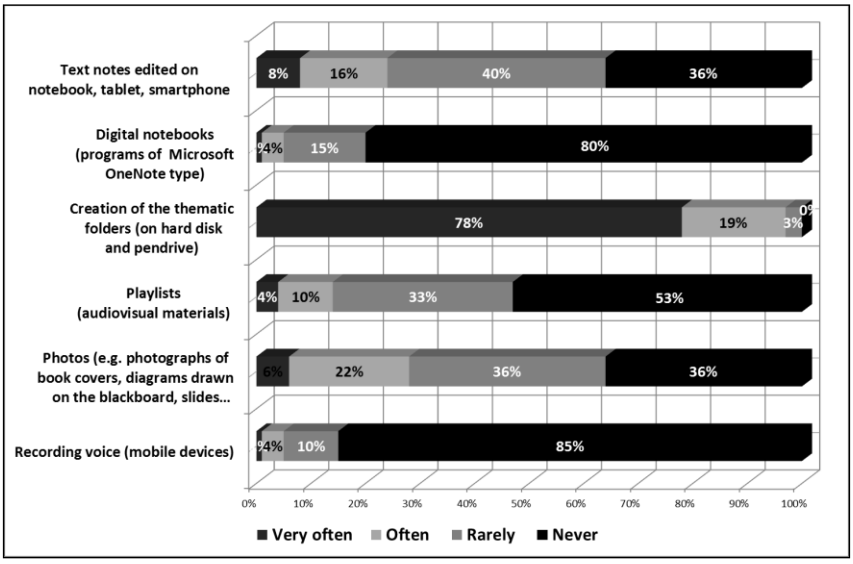

Figure 6. Methods of storing information in the digital environment

Source: own research

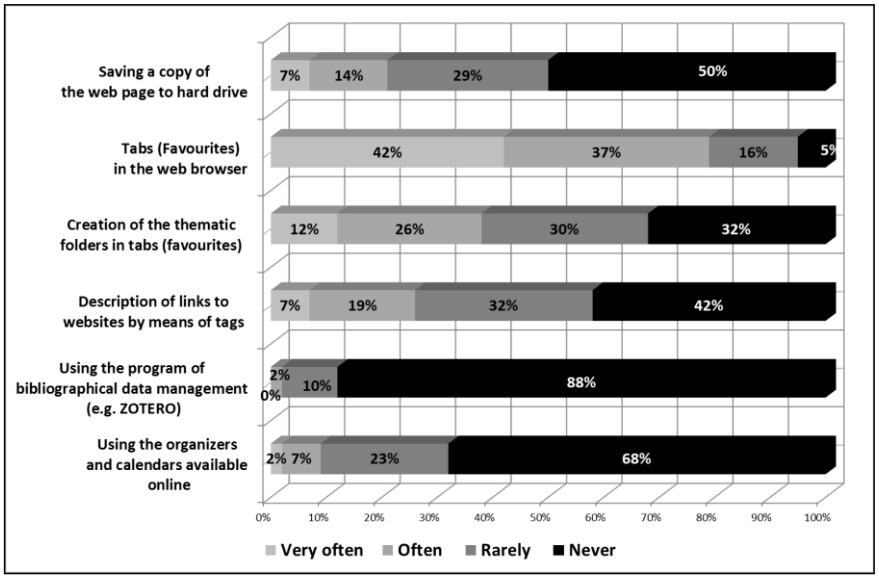

Figure 7. Methods of storing and organizing information on the web

Source: own research

Among the most commonly used methods of collecting information available on the Internet the respondents indicated websites tabs. They are used by as much as 95%

of the respondents. In order to find websites easier, a part of the respondents (58%) tried to describe them using tags, however, more frequently (68%) they create subject folders.

Another common method used among students of archiving web materials for the purposes of learning (used by about 50% of respondents) is saving websites on the hard drive.

As the research results indicate, the students very rarely use dedicated applications to manage the work cited data. They are used by 12% of the respondents. Not many respondents used online calendars and organizers.

2.2.3 Communication devices used for learning purposes.

The learning process takes places in isolation but also requires constant interaction with others. The digital environment creates endless possibilities. However, the most popular tool used for communicating with other participants of the learning process turned out to be social networking sites with the domination of Facebook. They are used frequently or very frequently by 87% of the respondents (Figure 8). Social networking sites have the edge that they are very easy to use on phones and other mobile devices. This enables staying in contact with other almost the entire time.

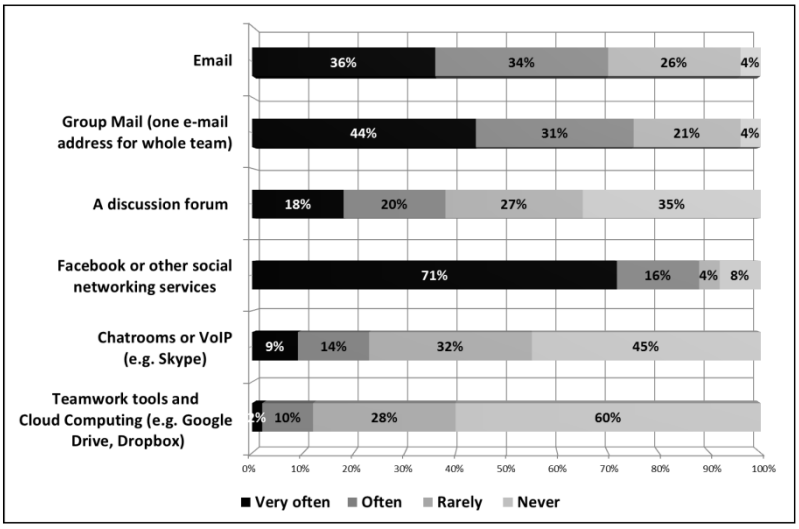

Figure 8. Communication devices used in the digital learning environment

Source: own research

A quite specific form of communication used by the students is the group e-mail which can be accessed by all interested parties. It is used constantly by almost 75% of the respondents.

Electronic mail, despite losing interest among the younger generation, is still utilized for learning purposes by 96% of the respondents. Relatively rarely the respondents used discussion groups (about 65%) and chats (55%).

One of the concerns is the fact that only 40% of the respondents use in their learning environment tools for group work and cloud computing such as Google Drive or Dropbox.

2.2.4. The awareness of creating a digital individual learning environment

One of the questions in the survey was whether the students try to consciously create their learning environment. The answers are shown on (Figure 9).

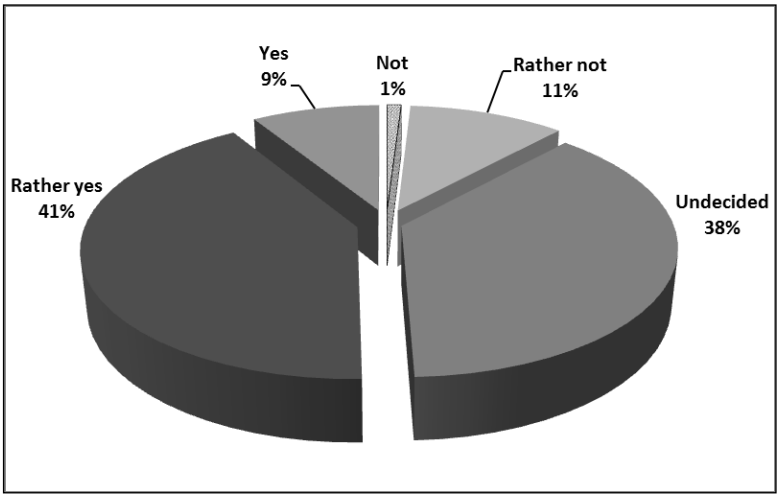

Figure 9. Conscious actions in developing the personal learning environment

Source: own research

Only about half of the respondents admitted doing it in a planned and conscious manner. The lack of such actions is the outcome of not evaluating one's learning process, it's strengths and weaknesses. Currently, the abundance of technological tools which can be used in the widely understood learning process may facilitate and increase the effectiveness of the learning process. Low level of awareness in this regard reflects on the low level of competences, connected with the effective moving around the digital space, and on the general culture of learning.

3. CONCLUDING REMARKS

When summarizing the results of the survey it is essential to say that contemporary students are more involved in creating their learning environment based on digital resources. It is particularly evident in the most frequently used sources of information. However, they inadequately use the advanced digital tools which facilitate searching and storing information. In practice they rarely use specialized search tools and tools for aggregating knowledge.

If the learning environment is to be effective, which facilitates using the resource-rich virtual space, it should increasingly utilize the technologies of storing

knowledge. It should also be developed and created in a conscious and planned manner.

One of the key elements in preparing the teenagers for lifelong learning, in a world dominated by technology, is the ability to create one's personal learning space aimed at helping to achieve personal learning goals.

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THE TURING'S CONTRACT CAN FORMULATE A PROBLEM

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Abstract**:** *Among numerous possibilities of software applications in detecting and formulating creative problems two seem to draw particular attention: internet search engines and linguabots (one of many types of bots). Slightly paradoxically, their current significance does not result from aimful perfecting. Both the discussed possibilities (but either in different respects) provide chances for implementation of a model form of functioning of the creative mind in the first most entropic stage of problem solving.*

Keywords: chatbot (linguabot), natural language, metaphor, analogy, search engine

INTRODUCTION

Application of the computer in detecting and formulating a creative problem can be based on two different computer programmes – Internet search engines and linguabots. However, the results of their ”work” should be approached in an untypical way. In the case of search engines, this specificity consists in accepting ”unnecessary” data; in the second case – in exploring the area of accessible (to a bot) associations with the help of questions which are ”inadequate” to its function. Both strategies – also paradoxically - show appreciation to the significance of the natural language in the creative process.

1. PERFECT IMPERFECTION

In a natural way, the attempts to improve “silicon intelligence” aim at eliminating mistakes, usually discovered *ex post* in the software designed by a programmer - these are the cases of oversight, imprecision, imperfect algorithms, logical gaps. This method turns out to be effective: various chatbots (Duch 2004; Rutkowski 2005; Godniak 2014) go well in solving more and more extended range of detailed

problems. With growing frequency, they also surprise competent judges (evaluating them in the categories of success at the Turing test) with the high level of solution. Yet, there is one sort of tasks which still remains inaccessible to the machine – it can be called simultaneously general and creative. What this means is that this class of tasks requires a very special and untypical system of very ordinary and typical operations.

Thus, how should the "universal machine", "prolongation of the brain", and "intellect amplifier" look like to serve the man in the specific situation of the creative process and, additionally, in its specific stage of detecting and formulating a creative problem? Such a "silicon alter ego" compatible with the man? Some intuitive answers have appeared since the very beginning of programmers' struggle with the difficult and delicate matter of modeling the human brain (Bagiński 1973; Heinrich 1974; Hunt, Thomas 2002; Kalinowski, Wolski 1974; Wirth 1980/1999). They get more real shape with each subsequent (and appearing in shorter intervals) generation of digital machines. The pace in which these generations appear is so imposing nowadays that precise indexing them starts to lose sense – the units to specify their "age" are not years any longer. Among specialists, the awareness of this is manifested in the saying "Tell me what your computer cannot do and I will make one which will do this", which has already become a cultural meme. However, it seems strange that its "twin complementation" did not appear – it could say: "the ideal programme is like the horizon – despite your efforts, it is constantly drifting away". This might be a classical creative situation which is depicted (as another meme again) with such phrase "All around claim that something cannot be done – someone comes who does not know this and simply does it". This freely and slightly unscientifically described climate around the efforts of programmers is divergent with two visions formulated still at the end of the previous century – they are amazingly close to their goal and they purposefully reflect the directions leading to that goal. Both visions are charming literary images, which can be said to have noticed that before *know how* there is always *how know*. In this way, they show (so much discussed here) appreciation to the stage of detecting and formulating problems – in a way in opposition to the stage of their solving. Moreover, this is done in a showcase way as regards both the typical (and prevailing at this stage of the creative process) heuristic rules and the type of information generated under their control. The first vision points *explicite* at limitations, *implicite* "veiling" the prospects, the second names these potentialities *expressis verbis*:

> (…) there are two kinds of [digital – JK] machine. The first is an "ordinary" digital machine, which is composed like the human brain; it can play chess, talk about books, the world, all the topics in general. If we opened it, we would see a huge number of interconnected circuits, just like interconnected circuits of neurons in the brain, and apart from this – its memory blocks, etc. **The second machine is quite different**. It is a gramophone magnified to a planet (or the cosmos). It possesses **very many**

> (…) recorded **answers to all possible questions**. Thus, when we ask, the machine "does not understand" at all, but the question form, i.e. the order of vibrations of our voice, activates the relay which turns on the record or tape with the recorded answer (…) Yet, is it possible to programme all possible questions. (…) We have been talking with the machine for a certain time and suddenly we ask whether it remembers the joke we have told it. The machine should remember it (…) We will ask it to tell the joke in its own words. Well, this is very difficult to programme: because we force the constructor of the "cosmo-gramophone" to record not only particular answers to possible questions but also **the whole sequences of conversations which can be conducted** [bold type highlighting in all quotations – JK]. (Lem 1999; 195-196).

> (…) the main problem, in Lem's opinion, of the constructors of artificial intelligence is inability to imitate by the machine t**he emotional sphere** of human brain, the consciousness of one's own ego, acts of will, **sense of humour** and all other specifically human traits of intellect. (…) If these human traces could be imitated successfully – we might get a creature with similar **defects** to those which **haunt** mankind. (Jarzębski 1999; 221).

Both these literary visions treated together suggest two ways for programmers to follow:

- extending data bases with untypical and so far ignored information (which is already gradually implemented);
- modification of operational systems which will give due rank to research results concerning not so much functioning of the human brain but rather broadly understood creative dispositions.

These directions constitute the specific philosophy of software programming, which can be briefly specified as abandoning the perfecting of "imperfect perfection" (artificial intelligence) in favour of accepting "perfect imperfection" (artificial creativity). It is the efficiency of creativity, in contrast to the efficiency of intelligence, which (by definition) is characterized paradoxically by certain "flaws" - and owing to them it frequently overpasses the efficiency of intelligence. Gradual focus on these elements in programming have probably resulted in the fact that it is **not** true any longer that:

- memory of the computer is only syntactic (contrary to basically semantic human memory);
- the operational system is based entirely on the most literally understood algorithmization of procedures (contrary to the rules followed by the man, sometimes exclusive and expensive – such as single heuristics, which are typical of creative process);
- total degradation of the result of its "work" is regulated by the zero-one

principle “everything or nothing” (contrary to gradual or partial degradation in the case of human failure to solve the problem).

2. TWO IDEAS: THE TURING'S CONTRACT CAN FORMULATE A PROBLEM

In compliance with one of the best known typologies of the creative process, the stage of detecting and formulating the problem is definitely situated in the green light phase. It is regulated by a set of processing heuristics, which mainly generate information due to the rule “everything is allowed”. This is the difference which distinguishes this stage from (chronologically and logically) later stages of the process, which in the second red light phase are regulated by the rule “only a little is allowed”. The specificity of the first stage consists in the fact that, by initiating and making the other stages and reasoning sequences dependent, it applies the phase rule almost literally. This enables completing (apparently) odd initial information in equally odd ways: making use of a coincidence, “anything” (any information), an intellectual experiment similar to simple association or mechanical juxtaposition of even very distant associations, ceasing or abandoning (for some time) work, taking up a quite different activity, collecting data with the help of an inevident (different) code, etc. What is implemented in this way are some rules and strategies typical of creativity which may seem little sophisticated, immature, or even erroneous, absurd, contrary to each other, unnecessary. Some have been applied specialist names – e.g. strategy of an embryo, of rational irrationality, of competent incompetency. In the discussed initial stage of the creative process, the reasoning steps based on these strategies provide overproduction of data, which (in compliance with de Lamarck's model of creativity) is indispensable and distinguishing creative thinking from its other forms. This excessive production saves the thinking from:

“overlooking” something in the very beginning;

lack of possibilities to return to the data which was rashly rejected by (too early started) red light, in other words – by unnecessarily activated criticism towards the generated idea.

It seems that such “perfect imperfection” (creativity) in its carbon (human) version can be supported by the silicon version (machine software) in various ways. Two seem to be at hand already now in the form of:

1) internet search engines;
2) chatbots (lingubots).

1. What an average net user complains about (Furmankiewicz 2012; Mierzecka-Szczepańska 2012) as distracting “information waste” while solving ordinary tasks (rather not problems) might turn into an attractive external information generating source - in the case of detecting and formulating problems. This is possible only if such potential is “discovered” by the user. The green light

suggests to the user a substantive association between data which is not visible:

- in the last of the search results – in such a sense that it is hidden behind the syntactic functioning of the search engine (and therefore it is often ignored);
- in permanently programmed, in some browsers (e.g. Google), blocks of iconically encoded data (images for...).

In the first case, the green light broadens the set of associations according to the chain model of their generation, which is most favourable for creativity. Contrary to the star model, it allows for linking by a content association those blocks of information which so far have been functioning in the user's cognitive map as unrelated. In the second case, the green light allows for implementation of the most favourable (for creativity) phenomenon – the conceptualization of images, which is based on analogy and metaphor. This phenomenon has its "mirror image" in the form of visualization of notions, which (in the case discussed here) can trigger off a whole sequence of such mutually reversible steps in various combinations. What is essential in these combinations are image metaphors and analogies, which have an iconic (policoncrete in fact) code enabling to overcome the schematism of language – an abstract code (Obuchowski 1985, 2004). Owing to this, the necessity appears in the space of the problem to formulate a problem in a different language (the more distant from the "starting" discipline, the better), which at the appropriate stage of managing the problem may be abandoned as substitutive or instrumental toward the basic one. Yet, it can be sometimes kept till the end and it is possible to present the solution in it (without "translation" into the original). What may be a well-known example of such (successful) strategy is the film "Once Upon a Time... Life", which familiarizes with the knowledge of anatomy and physiology of the human organism by consistently presenting all the phenomena and processes in the language of social psychology (not biology) .

2. What seems privileged among various bots are chatbots (Duch 2004; Labenz 2004). Programmes based on using mainly or entirely the natural language, despite their imperfect functioning, create opportunities for overcoming schematisms in the perception of the initial situation and also for the application of (well-known and tested in routine tasks) encoding the information. It should be emphasized that this concerns the ethnically natural language. It, not any selected world language (like English – the "21st century Latin"), creates these potentialities. It allows to go beyond the basic synonymous dimension in the lexical level of using language and to head for less significant (from this point of view) directions:

- using "strictly linguistic" stunts (Krzyżewska 2002), which are based more on the form than the contents of the utterance (on homonymy, oxymoron, literal interpretation of metaphor, metaphorical interpretation of literalness, onomatopoeia, etc.) and which constitute the medium for word pun;

– due attention to language mistakes as a potential external source of ideas.

Both strategies help to overcome the fundamentally anti-creative (because of its high level of conventionality) function of the language of everyday communication (Mudyń 1991, 2010). Both also enable searching for data in these language layers which are not significant in everyday communication (prosodic speech elements, knowing a very broad context of the utterance, etc.). Finally, both strategies are a source of certain sense of humour (Buttler 1968; Krzyżewska 2002), which is very important for creativity due to its numerous functions in the structure of the creative process (Nęcka, … Tokarz, 2005). In Arthur Koestler's theory, it even appears as its integral element (the famous triad which by treating onomatopoeia metaphorically illustrates the structure of the creative process: AAh! – Aha! – Ha, ha!)

Chatbots have been thought out as highly specialized programmes of very narrow applicability. However, if their data base was equipped in a certain small stock of information concerning several other (not necessarily related) disciplines and their operational system in heuristics of high level generality (in compliance with an unquestionable principle of creativity), they would function as high class experts in one discipline with general knowledge in several others:

> Speech recognizing programmes are **a paradise for word pun fans**. As regards semantics, the subtlety of the matter is even deeper. It is not feasible to understand many sentences pulled out of the context; we must know the **nuances, phraseology** and **slang** of the language which is dealt with. What is sometimes necessary is the familiarization with the **injuries** the speaker has. (Harel 2002, p. 176).

With such a standpoint, even the "empty chattering" of one of the first chatbots (called Eliza in the famous Joseph Weinzenbaum's programme "Doctor") can be approached more positively:

> An artificial therapist makes use of several dozen questions and general answers encoded in the memory, producing ordinary chatter, in this way using apparent intelligence. It was far from artificial intelligence, **but even though the observers' admiration was brought on (**Goban-Klas 2010, p. 132).

Due to such an approach, even anecdotes on the unfortunate slips of digital translators deserve reinterpretation and revaluation. Thus, it cannot be excluded that another (creative?) association will appear as a result of translating the biblical verse *Spiritus quidem promptus; caro vero infirma* from Latin into English as "alcohol good but meat not fresh" (Harel 2002, p. 176) instead of "The spirit is willing but the flesh is weak" (Good News Bible,1976, Mt. 26,41).

CONCLUSIONS

Neither using the search engine nor the dialogue with a bot can be treated (even not quite seriously) as a kind of *panaceum* for completing the space of the problem with the information indispensable in the next stages of the creative process. Yet, they can be treated as inspiration for not avoiding (in software programming) the elements which from the standpoint of logic seem odd or weird. Such an approach mostly concerns completing the data base with the above discussed groups of information as well as emphasizing the group of the so called heuristic algorithms (Rutkowski 2005, p. 12) - the algorithms which are, more directly speaking, "more and more heuristic", including single heuristics. This calls for proper appreciation of the psychological perspective (Rowiński 2010; Tadeusiewicz 2010). Due attention should be thus paid to the role of psychological views on creativity, practiced in the "cognitive" manner so that it could become a non-negotiable constituent of cognitive computer science (Ogiela 2011).

Translated by Agata Cienciała

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This paper is my own original work not printed before in other sources in the same form

EDUCATION OF CHILDREN WITH AUTISM IN E-LEARNING

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Abstract. *Considering the education and therapy of an autistic child, you should start by getting to know his patterns of behaviour and the data the child is interested in. A child with autism should be provided with a stable, orderly, safe environment, because it cannot function when there are too many changes around him. These children love to be moving around, so physical, rhythmic and musical activities are recommended. For a child with autism touch is the primary source of knowledge. When communicating we use short, simple sentences, look straight into their eyes. Autism teaches us to read the whole body. In education and therapy, you should use natural materials and objects from the child's every-day life, but also it is important to present multimedia exercises and introduce tasks for correction of movement, stimulation, mechanism of imitation, which are essential in the learning process.*

Keywords - autism, education, therapy, correction of movement .

1. THE CONCEPT OF AUTISM IN THE LIGHT OF PREVIOUS LEARNING

Autism is usually diagnosed around the age of three, when the child begins to participate in organized social gatherings such as preschool activities, the child's name day or family celebrations. It is noted that the children's social skills are lower in the case of normal children. Playing with other children is limited, they stay the same, and do not want to be touched by anyone. They refrain from eye contact, have difficulty expressing themselves verbally, and sometimes do not say anything at all. According to statistics, autism in children occurs once in 10 000 children, more often in boys than in girls. Autism can manifest itself in the following areas:

a) the child develops speech poorly or does not develop at all, uses words without meaning, communicates with gestures instead of words, have difficulty focusing attention;

b) the child will spend more time alone than with other children, is not interested in making friends, their eye contact is poor, smiles little;

c) the child is hypersensitive to touch or does not respond to pain, vision, hearing, touch, sense of pain, smell, taste may be more or less impaired;

d) the child lacks spontaneity or creativity when playing, does not propose any action, does not invent any playground activities;

e) the child lacks a mechanism of imitation, has a distorted sphere of reasoning;

f) the child is characterized by hyperactivity, or dementia, has frequent outbursts of bad temper for no reason, is excessively attached to one subject, or may show aggression or autoimmunity;

g) the child has problems with communication in a group, cannot cope with common activities;

h) the child presents a different attitude to the outside world from the normal man (Wolski 1996).

2. EDUCATION AND TREATMENT OF CHILDREN WITH AUTISM

Education of people with autism requires taking into consideration learning in the field of traditional methods, multimedia based on various information technology, but also a wide therapeutic area, the aim of which is to overcome the student's deficits and disharmony development. Learning should be planned and adapted to the child who is able to understand and solve educational tasks. In the learning process there should be carried out simultaneously exercises for general functions, such as perception, thinking, attention, intentional action, motion control, and so on. Goal can be well used in the home, as well as in recreational and playground, as well as in multimedia education (Stefańska 2001, p.34).

Teaching traditional skills like reading, arithmetic, learning about the world or the use of the mother tongue becomes much easier and more effective if we use for this purpose the student's natural environment. An important element is also the autistic person's learned reaction to natural stimuli and objects, as well as teaching aids that contain natural objects related to his everyday life. The fundamental rule in the education of an autistic child is that the pace, form and function of exercise should be imposed by the student rather than the teacher. The student should be active, setting and controlling the direction of the course. The teacher in this model plays the role of facilitator and adapts to spontaneous interaction, which is produced by the student (Bloom and Lahey 1978).

Knowledge about autism is growing tremendously. Since the first formulation of the phenomenon of autism in 1943, there has still been no cure for the changes in brain that create the symptoms of autism. We are still looking for better ways of understanding the disease and helping patients adapt, but we are unable to achieve a

full understanding of what autism is. There are different types of therapy in the field of speech, behaviour, vision, hearing, as well as drugs and dietary recommendations, but they are often ineffective. Treatments should be tailored to the individual needs of the patient.

The author of this work will pay attention to the corrective therapy movement, and the mechanism of imitation, these two factors in autism do not exhibit synchronization, because the child did not receive it during the birth. Autistic children from the area have movement disorders, and the lack of a mechanism of how to imitate. My research results confirm the view that the movement disorder and the mechanism of imitation are inherent in the phenomenon of autism. The research was conducted in preschools during lessons. The study used the method of observation and experiment. The observation evaluated the overall activities with children in several preschools. The experiment included the following exercises:

1. The teacher distributes children percussion instruments (drums, tambourines), which are designed to repeat the previously presented sound or rhythm. A group of six children performed flawlessly rhythms and repetition of sound. Autistic children with hypoplastic, ADHD had a hard time, or could not cope with it.
2. Each child presents its contrived beat playing the drum, the rest of the group must repeat it exactly. Most children have difficulty performing the task, which is correctly reproducing little rhythm. A child with autism in general do not execute it.
3. Children are supposed to learn the choreography for the song, split into pairs. Children with autism have difficulty reconciling singing and dancing, do not remember the end of the dance.

   The results of the research have enabled the author to conclude that the teacher in his work is guided by the principle of generality. Team education provides poor insight in the education of the individual. Similarly, internet programs lack flexibility, understanding of the child, offer too difficult tasks to perform, disproportionate to the mental development of the child. A child with mental disabilities is getting bored quickly, does not perform these operations indicated by the teacher, which leads to the child's low educational effects.

The study of movement disorders in children, and the mechanism of imitation, may serve as an early indicator of autism for diagnosis methods. They point to the need for the development of therapies to be used from the first months of life in autism.

Movement disorders in children with autism have been revealed in the lip shape, in sitting down, crawling, walking, and mobility in all motility. In normal walking, movements involving the arms and legs are symmetrical. In a child with autism there is an asymmetry (Suchowierska, Ostaszwski, Bąbel 2012).

Movement and music are combined in a natural way and the original eurythmics looking for the relationship between body movement and the movement in music; the relationship of music to the movement makes a man referring to the music to know himself, his values, the complexes, acts on the system of motivation, feelings, emotions, the level of concentration and attention (Adamski 2008:163).

Physical activity in addition to the development of muscles, bones, heart and lungs, strengthens also the basal ganglia, cerebellum, and the corpus callosum, and also increases the number of connections between neurons. Movement enriches and deepens the sense of rhythm is an important equalizer efficiency of human locomotion. Calisthenics, while linking music and movement, looking for relationships between body movement and the movement of sounds (Bring 1995; 79).

The movement belongs to the natural needs of the child conditioning its proper biological and psychological development. Dance as a form of traffic created as a natural need for movement to the music and to "manifest" their feelings through gestures, movements and facial expressions. Hand dancing satisfies not only the needs of the child movement, but also develop a series of psychophysical his disposal: perception, memory, concentration of attention, responsiveness, visual-motor coordination, orientation in the scheme's own body and space. It activates the body and mind of the child, developing his imagination, provide new impressions and experiences in the field of communication and interaction in a group, developing self-discipline. It teaches conscious control over the movement of the body. Dancing is a great way of recovering from stress, shock, accumulated aggression and tension, as well as an excellent form of exercise, developing physical fitness (Dutkiewicz 2000; 73).

A very important element in the development of the child's personality is fun – physical fun. The child not only practices the movements, but also learns the social world around them. Fun gives the child the fullness of life, which it needs: it is for him work, thinking, creativity, realism, fantasy, rest, and a source of joy (Zebrowska 1973; 243).

A particularly noteworthy is the therapy through movement of Veronique Sherborne. The main idea of this method is the use of movement as a tool to support the development of psychomotor and treatment of the development disorders. This method was started in the 1960s by Veronique Sherborne. There are several categories of the Developmental Movement:

a) the movement leading to the knowledge of your own body and motor improvement,

b) forming a compound unit movement of the physical environment,

c) the movement leading to the formation of a compound with another person,

d) the movement of the guide to co-operate in a group,

e) creative movement. (Sherborne 2003).

This method is used in educational institutions, by health professionals working with children with various disorders of development, as well as in working with autistic children. During the course children develop a sense of security, trust in others, responsibility. Classes are designed to help your child in learning itself, in getting to trust each other, understanding others and learning to trust them, learning is an active, creative life. For children with autism who are very afraid of these contacts, it is necessary, this fear of contact with others can be eliminated by spontaneous physical play, like swinging, bouncing, rolling on the floor, playing with a doll, and then the living man.

Physical activity can be carried out with the child at home, a group in class, using the traditional method, but also by multimedia. It would create the appropriate agencies to develop different types of physical activity, developing physical education, and to stimulate the mechanism of imitation. Parents know their child and thus can choose the educational and therapeutic program, which will result in the process of teaching and upbringing of their child. Developing synchronization between the movement and the mechanism of imitation, they activate further social, mental processes that will enhance the educational area. This is necessary in each treatment of an autistic child.

3. THE THIRD MAN IN THE INTERACTION OF MEDIA

The development of technology, especially computers and mobile phones, has created a virtual space. Virtual closeness does not require the existence of ties, nor does it lead to its creation, in contrast to the spatial proximity in a traditional style. Virtual space allows you to change sex, race, education, nature, etc. The environment in virtual reality is a world where you can freely express your emotions, your own beliefs, develop creativity linguistic, cultural and distance education (Burszta 2003).

Jahn Suler believes that there is a difference between the interactions taking place in the virtual and natural space listing them:

a) reduction of sensory experiences - the main form of transmission is written contact, which leads to reduced physical contact,

b) the liquidity of identity and anonymity - the written communication, the internet can reveal only certain elements of their identity. The writer can create a dual personality: attractive for the use of the network and daily uninteresting, but true.

c) equalization of status - in the virtual space are equal opportunity to express themselves all its members, regardless of their status, wealth, or race.

d) overcoming space constraints - everyone can communicate with people with similar interests and needs, regardless of the distance which separates them.

e) the availability of multiple contacts – the surfer alone can search, select, filter, defined by our contacts.

f) the possibility of a permanent record - each contact can be globally documented and stored as files.

g) altered states of consciousness - codes keyboard can control a reality and experience altered states of consciousness.

h) the experience of the "black holes" - Internet interaction can come in the blink of an eye and you may be excluded from contact (Goban – Klas 1999; 17).

4. MULTIMEDIA MEANS OF EDUCATION AND COMMUNICATION OF INFORMATION

The process of communication between people has played a huge role in the development of civilization. The ancient used the characters with symbolic meaning. They knew the technique of drawing, which led to finding the graphic forms of thought and speech writing (Goban- Klas 2001: 14).

The layout of characters led to the emergence of alphabetic writing and the invention of printing. Since the release of the first book Gutenberg printed in 1455 the impact of the first mass media has systematically developed. Telecommunications and computerization began in the mid-nineteenth century. Then came the telegraph, telephone, photography, gramophone records and film. Development of radio and television is the first half of the twentieth century, the era of the computer began in the late twentieth century (Goban- Klas 1999: 19).

Today, the most important form of communication, the mass media of information that have a significant impact on the contemporary culture. According to Gajda "mass media" as a tool of information is "the means of mass information." The concept of media is meant as “institutions and technical equipment for a broad and rapid transfer of information to groups of people (Gajda 2002: 26).

Media can be divided into (a) traditional (newspapers, radio, book), (b) alternative (Satellite TV, Internet), and more generally, are places and objects of worship, national memory and works of art. In parallel, there is the concept of information technology, which means combining in one audiovisual transmission of different types of information, especially audio, video, animation and text, through the use of the latest computer technology (Walczak 2003: 12).

Multimedia have a great potential in education as they offer the multicode flow of information. According to Morbitzer the process of knowledge creation is realized by means of three codes: pictorial, verbal and abstract. In the development of the human primary code there was code imaging, in a subsequent period, the verbal

code, nowadays the abstract code, which is a tool for mental operations. Multimedia Education distinguishes codes imaging and traditional education focuses on verbalism. In education, this important role should be played by the teacher, his task is to generate a smooth transition between the codes, because then the student carries information specific knowledge (Moribitzer 2001: 3).

The mass media are an integral part of everyone's life, an effective tool of civilization and cultural transformations, causing constant changes in norms, values, patterns of behaviour, exploration of scientific, artistic and technical aspects. Specific recognition of multimedia won encyclopedias, dictionaries, lexicons, programs for learning foreign languages. The extensive form of media allows individualization of the learning process and the implementation of various forms of distance learning. Knowing how to use the media is an essential element of human education and it needs to be directed so that the reception of the media could not cause a significant decrease in reading books and attendance at cultural institutions. Using the transfer of elite culture, such as theater or museum, is now rare. In a global society, the role of media education is so significant. Living in the information society provides many positive attributes, especially a rapid flow of information and access to databases, but also a large threat with such a huge amount of information. For the average consumer it is simply information overload, which he cannot cope with. Information has its value only when it is available where it is needed, useful and necessary.

Many young people are fascinated by virtual reality, especially when they are offered interactivity. The latest multimedia techniques, combining sound and three-dimensional image, and even touch, are creating such an impression of reality that a return to the real world is "necessary evil". Young man is very often identified with a virtual hero and he cannot see the border between the world of fantasy and the reality. This situation is changing autistic children who need it, they will experience altered states of consciousness and sense impressions of reality, they want the world to be to mimic the virtual characters. The present author noted that the relevant selected screenings for autistic children have a very positive impact on their mental and social sphere. They begin to talk, liaise with peers, play an identical role as a virtual hero. The sense of time and space in these children becomes reality, there are created cause and effect relationships (Adamski 2014).

There are changes in stereotypical behaviour and rigid belonging to the object and person. But you have to remember that the Internet is addictive according to Taboł (Taboł 2003: 28).

Internet addiction has symptoms such as: maintaining contacts with people only through the Internet, loss of interest in other forms of activity, change of the language, lack of control of the time spent on the network. To distract young people from everyday activities, and move long before a glass screen, it would create alternative channels of communication (Izdebska 2003: 27).

In addition to threats from the media, they are also great benefits. Through the media we get to know and understand the phenomenon of a global nature, for example a war or the threat of civilization. They play an important role in the dissemination of the achievements of culture of different nations. The mass media can create mass events, such as. Sporting, musical, cultural and educational, etc.. They are involved in the broad sense of cultural education (Frolowa 2002: 10).

Since 9 November 2002 Educational Satellite TV Edusat has been operating. It implements the program for viewers who wish to expand their knowledge in the various fields of science. This program brings and supplements knowledge of economics, education, psychology, management, education, science, foreign languages, environmental protection, tourism, extensive socio-political issues, including EU issues. This Satellite TV, transmitting academic lectures live from the auditorium of the university, can earn a bachelor's degree in extra curriculum system in the country and abroad (http://www.wsseuczelnia.edu.pl/show.php/page/35, accessed 12.07.2013).

It should be noted that children with autism need modern educational methods. The modern model of education should prepare users to make an effective use of multimedia tools and methods. Dissemination of information technology has a huge impact on schools and running in their learning process. The main problem is the skillful incorporation of the computer as a tool and method in the content of education, the student should master the new model of education. Memory mastery of the message should be replaced by the mastery of methods to search for, collect and analyze information. This would effectively prepare the student to the operation pattern in the computer world. To maximize the use of a computer at school is not enough adequate facilities teacher knowledge and skills of computer programs. Much more important is to teach him the creative use of the program in the educational process. The use of appropriate educational programs creates excellent conditions for the development of creative thinking learning children and the impact on their personality, and they accelerate and facilitate the acquisition of various skills and social competences.

5. THE IMPACT OF INFORMATION TECHNOLOGY ON THE TRANSFORMATION OF SOCIAL LIFE

The 21st century society is a global information society, which is the result of technological progress and the development of science. Information technology is associated with contemporary reality and affects all spheres of human activity. It creates wide possibilities of action in many areas of social life. Information technology is a set of means such as: computer, computer network, media, software, etc. It includes:

a) the elements of computer science (at school),

b) the impact of media messages,

c) social communication, through the news media

d) the social and ethical aspects of human activities in the field of information technology,

e) analysis and synthesis of information (processing, selecting and creating a consistent image)

f) safety systems and data (Siemińska 2007: 17).

Modern technology came into all spheres of social life, and it gives you new opportunities and the use of human potential (Toffler 2001: 25).

The Internet is an invaluable tool in the process of education and upbringing. It provides quick access to all kinds of information, allows you to have a conversation with other people, even in remote parts of the world and makes it easy to establish the broad social contacts (Adamski 2005: 84).

CONCLUSION

The mechanism of imitation plays a very important role in children learning, socialization and the acquisition of social skills. The nature of a normal child has endowed this mechanism, but the situation changes in a child with dyslexia, autism, depression, neurosis, ADHD or with mental retardation. In these children a mechanism of imitation is limited, and it works almost non-existent, such as autism. Educational programs often do not take this problem into account. They are meant for education of a global character with no intention to provide education for children with mental disabilities. This makes the teacher helpless in the face of this problem, but it becomes a serious problem for the child. The child is incomprehensible to other children and teachers, which leads to many psychological distortions in the child. Art has extremely important features to meet the individual needs of the child, among which we highlight: experiencing the need to survive, the need for attractive leisure activities, the need for creativity and the need for expression of feelings. Art teaches us living, developing desirable traits of character, deeper understanding of life and the world, determines the spiritual development of man. It contacts us through the art of approaching children and people together, giving them the opportunity to establish an emotional bond, develops interpersonal contact, making children vulnerable to the dramatic nature of the human experience, thereby raising the creative, dynamic thinking, and shapes teamwork, discipline and responsibility, creates social attitudes and the whole process of adaptation to the environment.

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STATEMENT

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THE TURING'S CONTRACT – AN EXTRAORDINARY EDUCATIONAL COMPANY WITH UNLIMITED RELIABILITY

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Abstract: *Education with a computer as a"soft version" of distance learning may be considered an interesting suggestion for education in the situations still viewed as "exclusive" though gaining significance for some socio-cultural reasons. The population with special educational needs is still increasing, despite the low birth rate and reduction of teachers' jobs. What is growing at the same time is both the need for life-long education and competition on the work market. This necessitates individualization of knowledge based on creativity. Omnipresent computer software is able to enhance human creative activity, including creative education, by attempts not only to solve but also to detect and formulate problems.*

Keywords: creativity, education with the computer, home schooling, space of the problem, space of the solution

INTRODUCTION: SOME FORMAL REMARKS

The headline of the presented study is formed as a conscious paraphrase of two significant book titles, which aims to signal references (both times somehow differently) to the ideas they comprise. Owing to the direct expression *"Turing's man"* placed in the title (Bolter 1990), the first book was the inspiration to continue the discussion on sociocultural effects of the so called defining technology of modern times by the phrase "Turing's man's machine" (Krzyżewska 2005). The second title *Computers Ltd.: What They Really Can't Do* (Harel 2002) provided inspiration from a strictly linguistic, technical level. Both books together confirmed my belief that the climate of rational cyberenthusiasm, which tints the presented considerations, does not result in sentencing me to such extreme views that deserve rejection (Rutkowski 2005). The category of "contract" suggests a specific (and positive) solution to the dispute about superiority of "carbon" intelligence over the

"silicon" one (or the opposite?) through rising onto a higher level of the analysis of their functioning – including its effects. The metaphor of unlimited reliability concerns the level of agency at each stage of the creative process, especially at the stage of detecting and formulating the problem. This stage (as the first – both chronologically and logically) constitutes a crucially important link of the creative process, which in itself is a complicated structure of many levels and components. Among the factors influencing the type, force and level of the dynamics of mutual relations between its particular elements, this "first link" naturally ranks as the most privileged.

The study consists of two parts. The subject matter directly refers to the text published in the previous volume (Krzyżewska 2013) and constitutes its specific continuation. "Continuation" here means that the specificity of distance learning is approached in the categories applied in the previous text. "Specific" implies that it is not likely to expect consistent and systemic development of all the threats undertaken (or merely signaled) earlier.

The first part comprises a brief (though not entirely reproductive) reminder of the selected issues which were the inspiration (and a logical premise) for formulating a couple of hypotheses in the second part. The third is an attempt at formulating an idea to apply two totally different computer programmes in one of the key stages of the creative process – detecting and formulating a problem.

1. REMINDER: CREATIVE EDUCATION WITH THE COMPUTER

The quantitative and qualitative abundance of forms and methods of distance education includes also a form which is simply called education with the computer (Siemieniecki 199a, 1999b). Slightly paradoxically, this form eliminates its specificity, which has been (exaggeratedly?) emphasized so far, among the other (classical) forms of education. This takes place by the principle of the worst (most untypical) case and a bit by the principle of an exception which confirms the rule, which has been even called "unspecific specificity" (Krzyżewska 2013; 556).

The principle of the worst case brings out the "oridinariness" of using a computer while solving educational tasks in all (not only distance) forms of education due to the growing acceptance (and necessity) of various applications of numerous software versions (Kędzierska 2007). The question "How did you get it – maybe from the Internet?" as a manifestation of the teacher's disapproval is becoming less and less valid. The problem seems to be on the side of the teacher, who is unable to find numerous ways to handle the "electronic educational mole". The remark/accusation "How did you get the right to know it?" is sometimes heard as well.

Yet, the principle of an exception which confirms the rule highlights the narrowness and fragmentary nature of the area in which not only distance education is located but also classical (non-computer) education or education in general, especially in its

institutionalized version. Still slightly stereotypically, this area seems to treat such "exotic" educational forms as individual education or home schooling[1] as exceptional - nothing to say about the combination of these two (and still some other) forms. The "exotics" of such teaching results from the fact that each of these forms is isolated due to a different formal criterion. This area seems much broader, which is shown and confirmed by such educational forms as lifelong education, seniors' education, by-learning of small children, etc. For simplification, the "classical" situation will be analyzed – limited to the software of a single computer (no matter whether used in the *desk-top* mode, independently from the net, or connected with it through a particular search engine). However, it should be realized that such possibilities are multiplying with geometric progression if it is taken into account that new technologies also include other, non-computer appliances of multimedia communication.

Both the discussed principles together bring about the awareness of another aspect of the issue: stress on learning vs teaching and specificity of the position, role, or even mission, of the contemporary teacher, who is now much more everything else than the only or basic source of knowledge.

2. DEDUCTION: THE UNCEASING TURING'S RACE AND ITS BROADBAND CONSEQUENCES

Several decades have gone by since Alan Turing's prediction that in about 50 years from its formulation the machine would surpass the man in solving tasks. This still cannot be confirmed as true. From time to time, multimedia (obviously also electronic ones) announce so much spectacular as fragmentary[2] "victory" of silicon intelligence (of a machine software) over carbon (human) intelligence - most frequently, only a fraction or percentage is provided of the "deceived" competent judges from the invited group of experts. It should be stated that the specific "Turing's race" is a fact – the tasks given to the machine are more and more difficult to solve and they require more and more sophisticated intellectual (only?) operations. Thus, it ought to be accepted that, in the background of the original idea of the Turing test, quite a different – double – "game" is taking place:

- not so much (or not only) about artificial intelligence as of artificial creativity;
- not so much (or not only) rivalry of silicon and carbon intelligence as their cooperation, or specific aggregation.

Otherwise, it would be impossible to increase the demands for the machine. Still, it would be impossible as well without raising the "bar" at the Turing test for the man at first. By reaching above the bar, or rather beyond intelligence, the man not only

solves the most difficult problems (tasks with a constantly growing information gap) but also finds and formulates them. Neither the man nor the machine will manage without creativity, which is very precisely defined these days. Creativity is not identical with intelligence and is not comprised in it, nor – which is most important – is it necessarily highly positively correlated with it.

Consistently following the rhetoric of the Turing test, it should be implied that it is not the man who competes with the machine but the man-machine system most probably cooperates with itself. My suggestion is to give it the name of the "Turing's contract" and to define the "broadband" nature of its consequences as the occurring (at various platforms of creativity) of:

- space of a problem vs space of solutions;
- potentialities of the man (teacher or/and learner);
- potentialities of the machine;
- potentialities of the (their) system.

On one hand, the consequences result from what the machine "already" can do and to what extent it can "replace" the man. On the other one, they also result from what the machine "still" cannot do and to what extent or/and in what sense this inability is similar to human. These are a kind of "boundary conditions" for creativity of the Turing's contract.

2.1. Hypotheses set I: space of the solution *vs* space of the problem

What seems to form the specific, progressive boundary of effective use of the computer in education is a certain type of tasks. Enthusiasts of artificial intelligence (and artificial creativity) know that it is a matter of time that the machine will win at the Turing test not only in the tasks requiring "only just" intelligence but also in those requiring "that much" as creativity. (The event which took place on the 6th June this year is the best example of this.) With certain simplification (and hope for avoiding falsehood), the tasks might be called "creative". This reasoning shortcut mostly concerns the adjective "creative", which basically refers to the result of solving such tasks, but (out of necessity) also concerns the process leading to this result. What seems most interesting, the adjective additionally leads to the origins of these tasks. This refers to the way in which such type of tasks are encountered by the learning subject. At least two following versions can be imagined in this respect:

1. Such tasks, or more precisely problems (which are as a rule differentiated from tasks, which indicates gradable level of the required creativity), may be "imposed externally", independently from the subject that will solve them – formulated by the teacher, found in the net, constituting the logical consequence of previous solutions to (not necessarily) similar tasks. What is essential in this situation is the fact that the subject has no participation in "detecting" the problem and formulating it in such a way that the same subject becomes the only autonomous "agent" of the whole sequence of activities. Being more exact, a set of categories

(probably more frequently), or diagrams (probably less frequently), or both in a particular proportion (probably the least frequently), in which the problem has already been partially "outlined", is a significant inhibitor of the (co)agency.

2. Such tasks, quite contrary, can be first detected and then formulated by the subject. In this case, the "creative agency" concerns this – crucially important for the space of solutions – first (both logically and chronologically) link of the whole sequence. Speaking directly but a bit teasingly, the subject (the learner) is in the situation of specific but only apparent "concealing" of the problem. Switching into the state of "revealing" may be accidental or may even depend on an odd (from the logical standpoint) premise, e.g. a dream or a day-dream. Following this weird reasoning, the hypothesis might be formulated that quite independent detection and formulation of a problem is a natural consequence of solving the previous problem, regardless the level of satisfaction it brought and the actual "reaching" the solution. This would explain (at least partially) the state of permanent "creative readiness" as a constituent of broadly understood creativity and its specific independence from outer conditions.

This is a model reconstruction of the most fundamental potentialities of traditionally understood individual creativity. Its dual clarity starts to blur when three facts have to be taken into account:

- the level of the subject's (in)dependence at each stage of the creative process, particularly the earlier discussed first stage – noticing or detecting the problem (and as a consequence, its formulating); in other words – the level of (co)agency at this stage of "handling" the creative problem;
- the kind and number of these "external sources" in the case of such (in)dependence; otherwise – the generic specificity of co-participation of (possibly different) creative minds;
- the type of code in which the detected problem is formulated at the start.

2.2. Hypotheses set II: positive feedback teacher - learner

What becomes a key task of the contemporary teacher of all educational stages is to "tame" all types of "the learner's external memory". This means that uncertainty of the teacher's role, feeling of lost authority, fear of disgrace, and resistance to revealing ignorance, which all seem to endanger the teachers' rank, should be transformed into prospects and chances for participation in an amazing - because consisting of at least two people and at least one machine - group of creative thinking (Brocławik 1991; Nęcka 1994 2001). However, the assumption is needed that after all the learner is the "agent" and the teacher rather an observer, consultant and reviewer. Yet, other versions of this arrangement are possible and needed in education. Undeniably, teachers are unable to, and should not, spend most of their free time on constant verification of in/compatibility of the received work with the products "thrown out" by search engines. Neither should they unceasingly attempt to control the feeling of frustration because of this. Only the following can

be done by the teacher:

- formulating tasks in a way which makes receiving an "internet crib sheet" impossible;
- in the situation of receiving an "internet crib sheet" as the learner's authorial study, subjecting it to an analysis with the help of questions similar to those of the "defense of the own work"; there might be more ways of handling such "easy shortcuts" (cheating in fact) but these two seem relatively simple and creative in the strict sense of this word.

Both cases require from the teacher not only the constant use of a certain universal instrumentarium for analysis and interpretation of the received work but also developing it and familiarizing learners with it. At first it is the teacher (despite the practiced discipline) who should dispose of - most broadly and simply speaking - philosophical categories, which are the foundations of such an instrumentarium. Owing to them, each metatheory is possible – also in such modest range as the school or university one.

What always seems feasible, even in the most perfected and unambiguous internet crib sheet, is re-grouping the elements to show the learner's newly born relations between these elements. In the face of unlimited access to internet sources, this might be the "only bit" (or maybe "that much") to teach in the classical way. Again – this skill is nothing special in distance education, it seems to rank high (the highest?) on the list of the teacher's "hardest" competences. In this dimension, the difference between modern computer-aided education and earlier education without a computer would consist in this that in education without a computer the range of sources to plagiarize would become less identifiable if it required browsing whole library volumes or verification in talks with potential consultants functioning not only as external memory but also as authors of "crib sheets".

Positive nature of the feedback mentioned in the subtitle should be understood in at least two ways:

- as sustaining the creative process not only independently from the quality of its effect ("creative product") but also independently from the very fact of its appearing;
- as sustaining and developing or perfecting the specific bond between the teacher and the learner.

Both phenomena are possible owing to the enhancing (rewarding) function of the creative product in the form of:

- its particular and actually existing effect (a solution to the problem);
- emotional components of the structure of the creative process or/and of its emotional (mostly positive) context.

Due to these forms the creative process (even undertaken and implemented

individually) is able to renew itself regardless the outer circumstances. This phenomenon is usually described in the categories of locating the source of creative activity in the broadly understood creative activeness itself. This gets specific and additional value in the situation of the group of creative thinking – solving a creative problem by the so called collective creative mind (Brocławik 1991). The teacher-learner system can surely be treated as such, at least to some extent (Topol 2013). This extent is specified by (non-)identity of co-participation conditions of both agents in creative activity (in such a group of creative thinking). Various versions of their arrangements constitute a bipolar *continuum*. In compliance with the traditional approach to (mainly institutional) education, it substantially depends on the role which the teacher will establish or "agree to" in the educational process. This results from the reviewer's role which teachers should apply when a solution is presented. This variant is one pole of the *continuum*. The second – much more "revolutionary" – terminates all attributes of the teacher's distinguished rank, including reviewing the solution. What stretches between these two extremes is a vast space of intermediate variants which can be described in the categories of both equal rights and equal duties of co-participation in groups of creative thinking for the learner and the teacher.

The aspect of the above distinguished position of detecting and formulating the problem (in contrast to undertaking something "given to solve") emphasizes all the details. It is this stage which "equals" the position of the teacher and the learner already at the start. The (very high) level of entropy which is handled by the teacher, who is "forced" to trace the learners steps from the very beginning, is parallel to the (equally high) level of entropy with which the learner has to cope when faced (by the teacher) with the starting situation with a considerable information gap. Here, the rules of the game are imposed by the learner right from the beginning. Therefore, it is the teacher who has to trace the learner's subsequent steps and to follow his/her reasoning:

- to detect and accept mutual relations between the data;
- to understand the heuristics which brought these relations about.

The extent of mental discomfort - resulting from the lack or dramatic shortage of initial information, quite frequently from cognitive dissonance, especially its special form of notional conflict (Berlyne 1969), makes the position of the teacher and the learner equal at the start. With some risk, it can be said that this even gives the learner slight advantage over the teacher, making the former the main (only?) "actor of the start" and leaving the latter merely with the role of the "observer of the start".

Generating information indispensable for lowering the level of entropy in the space of the problem within computer-aided education might be a challenge but may also become the "curse of abundance" problem.

2.3. Hypotheses set III: computer

Approaching the matter slightly subversively, implementation of both possibilities

pivots not only on the current potentialities of "silicon intelligence" but also on the attitude to these potentialities of the man who uses them. Despite their gradual elimination (which occurs with various effectiveness), the well-known limitations of artificial intelligence allow to view it still as "imperfect perfection":

> Computer is an instrument which allows for using and ordering all the knowledge, an instrument helpful in planning, creating, collecting, concluding, storing, presenting and analyzing information. It is a universal machine. (…) it may help and **enhance our intellect**. Yet, t**he help with acquiring knowledge is a starting point for creative processes**. (…) Even the best computer does not eliminate the creative contribution of the man. However, (...) a person finds in the computer an artful, quick and always tireless assistant. McLuhan would say that this electronic device is the **prolongation of the brain** [bold type highlighting - JK] (Goban-Klas 2010 132).

CONCLUSIONS: FINAL SUBSTANTIVE REMARKS

In a natural way, the attempts to improve "silicon intelligence" aim at eliminating mistakes, usually discovered *ex post* in the software designed by a programmer - these are the cases of oversight, imprecision, imperfect algorithms, logical gaps. This method turns out to be effective: various chatbots (Duch 2004; Rutkowski 2005; Godniak 2014) go well in solving more and more extended range of detailed problems. With growing frequency, they also surprise competent judges (evaluating them in the categories of success at the Turing test) with the high level of solution. Yet, there is one sort of tasks which still remains inaccessible to the machine – it can be called simultaneously general and creative. What this means is that this class of tasks requires a very special and untypical system of very ordinary and typical operations.

Translated by Agata Cienciała

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