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FOREWORD

Dear readers, dear colleagues!

The new issue of the scientific journal Acta Technologica Dubnicae brings inspiration for your work and, at the same time, an opportunity to present your theoretical suggestions, opinions, theoretical views, insights, and to share your experiences from your educational practice. We are committed to provide a creative and stimulus platform for the educational reality.

The second issue of the third volume of Acta Technologica Dubnicae consists of two scientific studies, six articles, two authors contributed to the section of reviews and one author brings information about a significant event. The authors of the papers are professionals from Slovakia, but also colleagues from five other countries worldwide. We are glad that Acta Technologica Dubnicae is gradually finding its readers and contributors behind the borders, too, and is being recognized by the broader scientific community.

The section of studies, oriented on information and communication technologies, is opened by the paper of the collective of three authors from the Vytautas Magnus University in Lithuania - M. Tereseviciene, A. Volungeviciene and E. Dauksiene. The authors present their research dealing with virtual mobility. By its results, they show the importance of virtual mobility for international communication, for the development of communication skills, and also its influence on the internationalisation of university education.

The paper by two Slovak professionals G. Sláviková and J. Tej brings an analysis of the results of an empirical research on the use of online courses, managerial simulations and the application of new technologies in the process of university students' key competence development.

J. Pazonyi and E. Bodonyi from two universities for humanities in Budapest analyse the results of a three-year research. On international workshops for teacher trainees, they studied mastery and the effect of learning by doing on their development and language literacy. They also pay attention to methods of language literacy development in alternative schools.

J. Šulistová deals with language literacy, in particular the use of content and language integrated learning – the CLIL method – and provides a sample lesson in her article. The author shows the pros and cons of using the CLIL method and the requirements on teachers.

In the previous volume, a professional article on the place of neuroscience in educational sciences (Trníková, J. and Petlák, E., 2012) was published; and in this issue, Hans Schachl from Private Pädagogische Hochschule der Diözese Linz continues in the attempt to prove the existence of principles and indications for teaching and learning based on brain physiology as learning happens in the brain.

On the pages of Acta Technologica Dubnicae, the field of special education is dealt with for the first time. A. Benyovszky's article, who represents the Conductive Learning Center at Aquinas College in Grand Rapids, Michigan, focuses on one of the alternative forms of working with individuals with physical disabilities – conductive education and its creative forms. The author brings information on positive experiences with using this method worldwide and from teacher trainee programmes; she also emphasises the need for the extension of the international network of institutions using this system.

The professional paper submitted by the collective of authors from the Institute of Technology and Business in České Budějovice and Dubnica Institute of Technology addresses the issue of using didactic means and technologies in the educational process at technically oriented universities in the Czech Republic and in Slovakia. The research results highlight new trends in university education from students' perspective.

R. Osad'an from the Comenius University in Bratislava and E. Drgoňová from a primary school in Bratislava deal with the issues of eating disorders and body perception of children. The authors compare their research results with the results of an Australian study; in the final part of the paper they give suggestions for anorexia and bulimia prevention.

In this issue of Acta Technologica Dubnicae, we have given space to two book reviews. The review of the monography by the collective of Hungarian authors G. Pusztaí - Z. Tóth - I. Csépes: Current Research in the Field of Disciplinary Didactics (Budapest, 2012) was written by Ján Gunčaga from the Catholic University in Ružomberok.

P. Hlad'o's Orientation of Adolescents: Findings from Theories and Research (Brno, 2012) is the next reviewed monography; the review was prepared by J. Krátká from the Masaryk University in Brno.

The reviewers introduce and evaluate the titles above and bring other educationalists information on their contribution.

Finally, L. Várkonyi informs about an important scientific conference titled "Present Day Trends of Innovations 2013", which was held by Dubnica

Institute of Technology in Dubnica nad Váhom, Slovakia, this year. The author introduces its conclusions and recommendations for practice.

Dear readers, colleagues, I would like to thank all the authors, peer-reviewers and the members of the Editorial Board of Acta Technologica Dubnicae for their creative work and at the same time I wish you all a good time in the company of our scientific journal.

*Viola Tamášová
Editor*

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24th - 25th May 2013 Podbanské – Grandhotel Permon

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STUDIES

Fostering Internationalisation in Higher Education by Virtual Mobility

*Margarita Tereseviciene – Airina Volungeviciene – Estela Dauksiene**

Abstract: The concept of virtual mobility and its characteristics are presented. Most definitions which consider virtual mobility from the educational perspective describe it as a form of learning, research, communication, and collaboration, but also as a form of mobility, which can be a supplement or substitute for physical mobility.

Based on the theoretical dispositions a study module “Learning in Higher Education” was created and delivered by an international, multi-institutional group of teachers to an international, multi-institutional group of students. The virtual mobility case, research design, and data analysis, are presented. The results demonstrate the importance of virtual mobility in promoting international communication and developing communication skills with people from other countries, cultures as well as impact of internationalisation on higher educational institutions.

Key words: internationalisation, virtual mobility, communicative and collaborative learning.

Virtual mobility (VM) is rather a new phenomenon and has been influenced very much by the development of ICT; however, virtual mobility also encourages institutions to adapt and further develop their pedagogical models: the change in content delivery and the change of learning tools require changes in pedagogy and didactical models (Bijnens, H. and Op de Beeck, I., 2006). VM facilitates intercultural experience between students and their staff, through the organization of trans-border discussion groups, international seminars, or by setting up of an international learning community; whereby staff and students acquire interpersonal and intercultural skills and get a chance to broaden their

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cultural, social and political boundaries. By providing supplementary courses virtual mobility enables students to further individualize and specialize their portfolios.

The aim of the research is to define virtual mobility as a communicative and collaborative learning activity of students and teachers and to explain its contribution towards the internationalisation of higher education.

1 Virtual mobility and internationalisation

The first notions of virtual mobility (VM) arose in the last decades of the 20th century and at the beginning of the 21st, in some research papers (Bunt-Kokhuis, 1996, 2001, Van der Wende, 1998) and project result reports (Boninsegna and Dondi, 1998; Spot+ project team, 2001, Valiuškevičaitė et al., 2006). Bunt-Kokhuis (1996, 2001) created a rather interesting though idiosyncratic definition of VM, where it is described as “the collaborative communication between a faculty member and his/her counterpart(s) mediated by a computer. More often, these meetings will be interactive and take place across national borders and across time zones”. Boninsegna and Dondi (1998) characterize virtual mobility with the following elements “*Trans-national lectures and/or learning materials, Cross-border recruitment of students, Intensity of communication flows, International accreditation of achievements, Multilingualism, Complementarities to both physical mobility and conventional teaching*” and stress that “virtual mobility includes all forms that are communication intensive and run at international level.” (Boninsegna and Dondi, 1998, p. 7)

Van der Wende (1998) defined virtual mobility in terms of an emerging form of internationalization where students follow courses offered by institutions abroad and interact with students and teachers, libraries and databases, in other countries. She promoted use of ICT for expanding the possibilities for cooperation and competition between institutions, and for providing students and academic teachers who are not able to travel extensively, with opportunities to benefit from internationalization. She also noticed the relationship with the idea of virtual mobility, flexible knowledge delivery and the new educational paradigm for e-learning or distance education.

The Coimbra Group collaboration, based on the research carried out during the VICTORIOUS project (Haywood et al., 2007), stressed the intercultural aspect and explained virtual mobility as the “use of the internet to enable learners to take courses and participate in local communities at a remote physical university without need to go to it directly. It often implies more than just taking courses but being able to access some of the cultural aspects” (p. 70). A more full-scale interpretation, which includes the intercultural aspect of VM, in order to “highlight the richness of the experience and the similarities with the Erasmus exchange programme” (Op de Beeck et al., 2007, p. 18) is provided in the

Virtual Mobility Best-Practice Manual (Bijnens et al., 2006): “Virtual Mobility is a form of learning which consists of virtual components through an ICT supported learning environment that includes cross-border collaboration with people from different backgrounds and cultures working and studying together, having, as its main purpose, the enhancement of intercultural understanding and the exchange of knowledge”. The existing definitions were extended in the Move-IT project and rephrased “as a set of ICT-supported activities that realize cross-border, collaborative experiences in a context of teaching and/or learning. These activities can take place in a fully ICT supported learning environment or as a complement to physical mobility (before, during and after). They can be aimed at the (practical) organization of the learning process or they can consist of actual teaching and/or learning activities. Virtual Mobility activities can cross borders between regions, countries, cultures and languages, but also between disciplines. Virtual mobility activities enable collaborative learning (i.e. learning from and with each other) and are always aimed at inter-cultural experiences” (Vriens et al., 2010, pp. 1-2).

Pawlowski, Holtkamp and Kalb (2010), describing internationalization competences, distinguish between internationalization and domain specific competences. Internationalization competences are seen as supporting competences to enable individuals to apply their domain knowledge in an international setting. Internationalization competences include intercultural competences in particular, which often can also be seen as an informal learning outcome of mobility, ICT competences, communication competences, collaboration competences and project management competences.

Summarizing the above mentioned definitions that analyse the concepts of virtual mobility and internationalization, the following characteristics of virtual mobility can be distinguished – the cooperation of universities as well as students and teachers; international study experience with the stress on cultural aspects, and different kinds of activities that lead to virtual mobility. It is important to highlight that although most of the definitions which consider virtual mobility from the educational perspective describe it as a form of learning or collaboration, they also stress that it is a form of mobility, which can be a supplement or substitute for physical mobility.

Analysing different resources, various virtual mobility characteristics or elements can be described, and they refer to the typology of virtual mobility activities, mainly constituted of virtual seminars, courses or programmes, virtual internship and virtual activities to support or extend physical mobility. Summarizing virtual mobility practices and concepts, as defined by various authors and project consortiums, virtual mobility can be defined as an activity or a form of learning, research, communication and collaboration, based on the following characteristics:

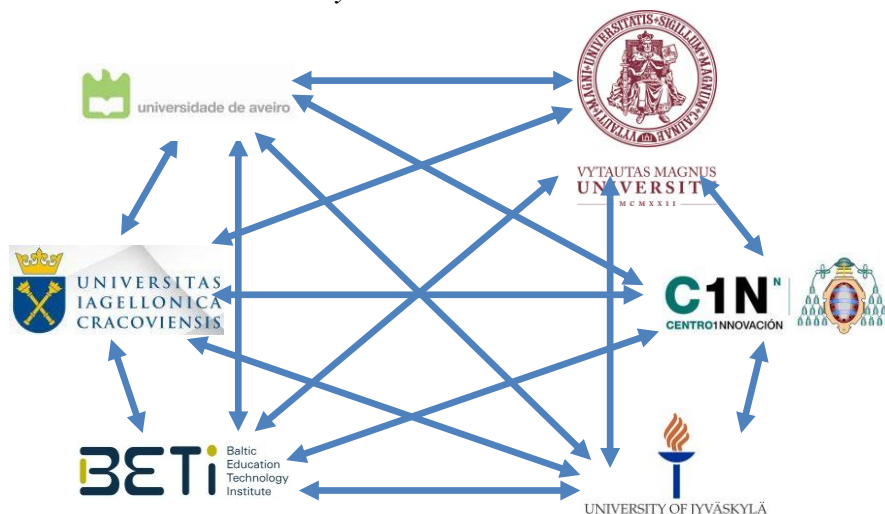
- ❖ cooperation of at least 2 higher education institutions;
- ❖ virtual components through an ICT supported learning environment;
- ❖ collaboration of people from different background and cultures working and studying together, creating a virtual community;
- ❖ a clear goal and clearly defined learning outcomes;
- ❖ exchange of knowledge and improvement of intercultural competences as its main purpose;
- ❖ as a result of which the participants may obtain ECTS credits and/or its academic recognition will be assumed by the home university;
- ❖ visibility of university in higher education area;
- ❖ integration of ICT into their mainstream academic and business processes.

It is seen that virtual mobility enables universities to cooperate at a variety of levels. The main virtual mobility feature to be noted here is that virtual study course(s) or a programmes can be designed and/or provided for students by more than one host university and that is not usually the case in physical mobility. Organizing virtual mobility this way the students can attend course(s) from different institutions, study and work collaboratively in a more diverse international group, gaining experience in dealing with cultural differences of more than one country. New European initiatives (UbiCamp, 2012; VMCOLAB, 2012) make further steps in developing joint virtual mobility activities to provide students and teachers with cultural background and enriched university environment elements (multilingualism, virtual tours, virtual mobility support-kits) so that students have more similar cultural advantages to those involved in a real mobility and intercultural experience. Both academic and cultural content becomes equally important for students and higher education institutions.

2 Case presentation

The virtual mobility case (Fig. 1) represented and analysed in this paper had been prepared by the interuniversity team and had been implemented as the study module “Virtual Learning in Higher Education”. The preparation team consisted of 13 teachers, who were delivering the module and there were 29 virtual mobility session participants from the following higher education institutions - University of Aveiro (Portugal), Jyväskylä University (Finland), UNIOVI-University of Oviedo (Spain), Jagiellonian University (Poland), BETI (represented by students of KTU, Lithuania), and Vytautas Magnus University (Lithuania) - attending the module.

Figure 1 *Virtual mobility case*



The following research methods were used in the research:

- a scientific literature review and document analysis were used to support the module “Virtual Learning in Higher Education” as a case study. Tools and assessment methods were defined, as well as their theoretical and empirical exploration analysed.
- a case study, during which 3 online surveys were used to identify what was required for the preparation of lecturers for virtual mobility (as communicative and collaborative learning activities, necessary for internationalisation of higher education institutions) implementation, as well as competences necessary for participants to participate in virtual mobility. The online survey data was analysed in order to define peculiarities of module organization, the competencies participants acquired and developed, and the recognition possibilities of the achieved learning outcomes at the participating universities. Data analysis method was descriptive inferential.

The research was implemented in five stages. The search, selection, and analysis of educational policy, juridical documents and scientific literature were performed at all stages in order to justify the virtual mobility case. A common empirical research design is represented in Table 1.

Table 1 *Empirical research design*

EMPIRICAL RESEARCH DESIGN				
Systemic analysis of documents, legal acts and scientific literature	Study module “Virtual Learning in Higher Education (VLHE)” preparation	Research instrument – questionnaires for teachers and students – preparation	Study module VLHE delivery. Research performance after the study module	Analysis and systemic analysis of the content of the questionnaire data, and preparation of the research report
1 st stage	2 nd stage	3 rd stage	4 th stage	5 th stage
Search, selection and analysis of educational policy, juridical documents and scientific literature				

The 1st stage of the research. A systemic analysis of documents, legal acts and scientific literature was performed. The aim of the analysis was to create the background for the methodological research framework and prepare the research instrument.

The 2nd stage of the research. A study module “Virtual Learning in Higher Education” as a case study of virtual mobility was prepared. Learning goals and outcomes were indicated, learning content prepared, technological and assessment tools and methods selected. All 6 participating institutions developed a joint study module consisting of 12 learning outcomes–based on 6 study sub-modules (8 academic hours each, using various learning scenarios and resources), including learning outcomes assessment strategy.

The module was of 6 ECTS (video lecturing, individual student work, teacher consultations and evaluation of learning outcomes). The aim of the Virtual Learning in Higher Education (VLHE) module was to enable students to plan and experience virtual mobility sessions by practicing video lecture participation, performing group and individual online activities, using and sharing virtual resources in a multicultural virtual learning environment. The teachers from the participating institutions formulated the learning outcomes which students were to acquire during the course and elaborated sub-modules during which these learning outcomes were to be reached (see Table 2).

The course curriculum content was developed using the Moodle virtual learning environment. Each participating institution prepared 1 sub-module which had to include compulsory readings, a student guide, activities, recommended resources, sub-module guidelines, and a sub-module discussion forum.

Table 2 *Virtual Learning in Higher Education module*

VIRTUAL LEARNING IN HIGHER EDUCATION MODULE		
Participating institution	Sub –module	Learning outcomes. Students will be able to:
Jyväskylä University	Cultural Models (week 1)	1. Understand culture models and their application in education.
Innovation Centre of University of Oviedo (UNIOVI)	Collaborative Online Learning (week 2-3)	2. Know different technological resources for collaborative group work online. 3. Demonstrate the skills needed to facilitate collaborative group work online.
Jagiellonian University	Information Literacy (week 4-5)	4. Analyse online information. 5. Create online materials.
BETI	Advanced Learning Technologies (week 6-7)	6. Define the technologies and standards used in distance education. 7. Apply learning management systems based on these standards.
Vytautas Magnus University	Learning Strategies (week 8-9)	8. Compare learning styles and learning strategies. 9. Identify and apply online resources in order to implement learning strategies virtually.
Aveiro University	E- Assessment Strategies (week 10-11)	10. Design assessment strategies for virtual learning. 11. Use tools to support scenarios of virtual learning.
Jyväskylä University	Cultural models (week 12)	12. Apply the knowledge of culture models to solve problems caused by cultural differences in Virtual Mobility.

The participating institutions agreed that each of them would have a session for 1 or 2 weeks on a topic. Sessions were organised in a synchronous (video conferences were organized each Friday) and asynchronous way (records of the videoconferences were available for students who could not participate in the videoconference).

The 3rd stage of the research. The research instruments – questionnaires for students and teachers were constructed. The structure of the questionnaires for students and teachers that were administered after the module was very similar. The questionnaire for teachers consisted of the following parts: general questions, lesson planning, virtual mobility organization and quality assurance, virtual mobility competence, and virtual mobility recognition. The questionnaire for students covered the following fields: personal data, learning outcomes/competence acquired, organizing virtual mobility, virtual mobility skills, and virtual mobility recognition.

The 4th stage of the research consisted of 2 types of activities – delivery of a study module and research implementation.

The students from Vytautas Magnus University, University of Aveiro, Jyväskylä University, Kaunas University of Technology, Jagiellonian University, and Oviedo University were registered in the virtual learning environment (further VLE) Moodle. All study materials, such as descriptions of the module and sub-modules, content, presentation slides, scientific papers, links to web pages, etc., were uploaded in VLE. Students had to participate at 2-hour videoconference lectures staying at their home university each week. During the lectures, the teachers from the participating universities (depending on the module) were delivering their sub-module lecture, describing assignments that the students had to perform during the upcoming week, discussing various unclear issues and giving feedback on the performed assignments. All the lectures were recorded and accessible for students who could not participate in the videoconference as lecture records in VLE. So the students had the possibility to review the lecture records at home.

All module assignments for students were either individual or to be performed in national or international groups. There were five international groups that usually consisted of one participant from each institution. The international groups were stable for the entire module in order to create the possibility to communicate and collaborate for participants of various cultural backgrounds. The participants' assessment was performed after finishing each sub-module.

The research was performed after mobility sessions were implemented, this refers to both student and teacher online questionnaires.

The 5th stage of the research. The content analysis of the obtained data and their statistical analysis were performed, and a research report was produced.

2.1. Tools for virtual mobility

“Virtual Mobility in Higher Education” module curriculum content was developed using the Moodle virtual learning environment (VLE). The module was divided into 6 parts. The first section of the module called “General Information about the Module” was left for general issues, and the following aspects were indicated in it:

1. Two forums were created for organizational issues - "General Module Information Forum" (teachers provided important information to students) and "General Forum" (for both students and teachers – organizational issues were discussed).
2. Module Descriptions. General information about the module was presented in this section. The following information could be found here by students: the title of the subject, participating institutions, participating teachers, division of this module into sub-modules, module goals and learning outcomes, the language of the module, pre- requisites for this module, and its duration (months, hours, and credits).
3. Technical help. Technical help during the delivery of this module was provided. Either if students had problems with VLE Moodle or there were some problems with video conferences, they could contact the person responsible for the particular area. Both persons' contact details were available for all participants.
4. Pedagogical help. In this part, the contacts of all teachers who were delivering the module were listed. Since this module was divided into 6 sub-modules, the dates and teachers of every sub-module were identified.
5. Video conferences/ synchronous meetings. Every video conference was recorded and the link for the record was provided in VLE Moodle environment.
6. Time planning of the module was made in the calendar. Moodle has quite a functional tool for planning events, assignments and meetings. Since teachers posted their assignments using an assignment tool, the system added all the assignments to the calendar automatically. It was very convenient for students, because all the important dates and assignments were in one place.

There were a lot of technical possibilities for students to collaborate online, store their study results (a portfolio tool was installed for this purpose in VLE Moodle) and communicate with other international students. During this virtual course, a lot of tools were used. Students had the opportunity to use the virtual learning environment with its internal tools (forums, wiki, blogs, e-portfolio, mind maps, etc.), a web conferencing tool, a survey tool, and a recording tool.

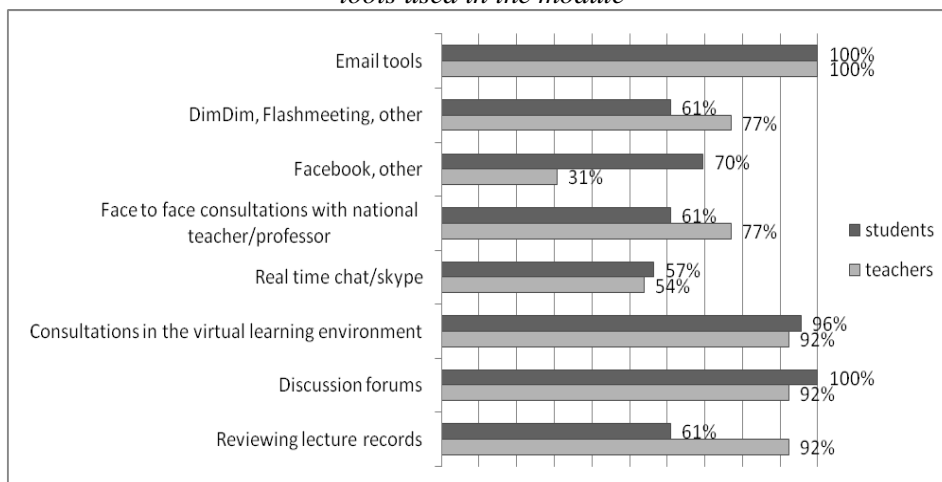
The access to the curriculum was enabled at the Moodle virtual learning environment using networking services for educational institutions. The idea to apply this technological solution was derived from the need for the creation of a virtual campus for the participating universities. Therefore the Moodle networking service was established at all participating institutions – all users using Moodle virtual learning environment at home institution were able to access it and to enter to the Moodle network server using their institutional Moodle logins. For those institutions who decided not to use Moodle networking tool – usernames and passwords were created and sent to the institution's IT administrators.

3 Results

Two different questionnaires were used for students and teachers, however, some of the questions were the same. Therefore most teachers' and students' answers, related to virtual mobility organizational issues and curriculum internationalization possibilities, could be discussed and compared. They cover such sections as the importance of tools and feedback methods, virtual mobility competences improved during the course, participants' opinions on virtual mobility after experiencing it, and its recognition possibilities in higher education institutions.

One of the ways to communicate and organize the learning process in virtual mobility is the use of ICT tools. Figure 2 shows the opinions of teachers and students on the important communication and collaboration methods and tools used in the module. All communication methods and tools were found important by participants (by 50% of participants or more), except social networks, rated as important only by 31% of teachers (see Fig. 2).

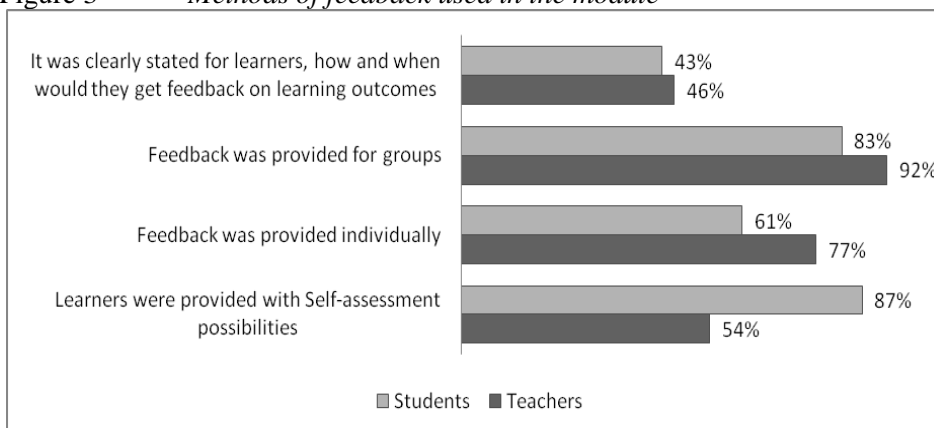
Figure 2 *Importance of communication and collaboration methods and tools used in the module*



Email tools, discussion forums (both rated as very important), and **consultations in the virtual learning environment** (rated as important) were indicated as the most important ways of communication and collaboration (see Fig. 2). The importance of other methods and tools was perceived differently by students and teachers: reviewing lecture records, videoconferencing tools, and face to face consultations with a national teacher were considered to be more important by teachers than by students, and vice versa – social networks' importance was rated much higher by students than by teachers.

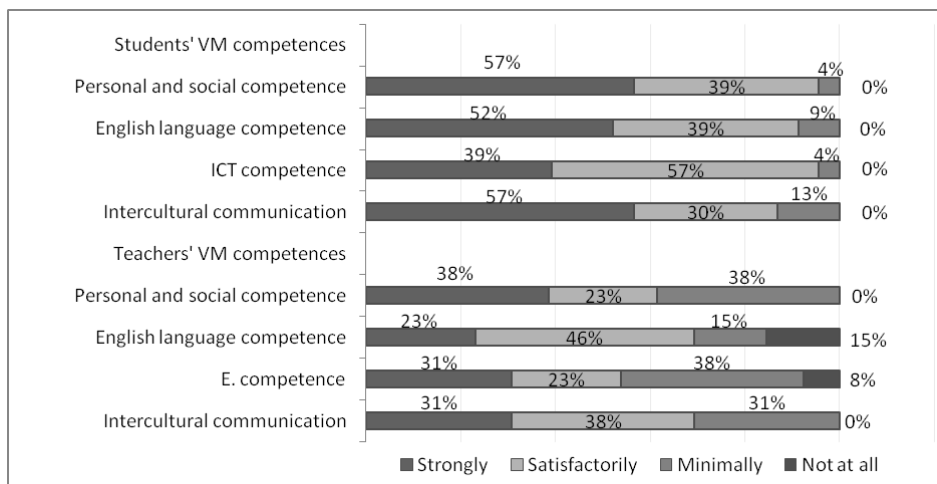
Another important aspect in the organization of virtual mobility is providing feedback. We can assume that, according to most teachers and students, feedback was provided to both individuals and groups (see Fig. 3), though more teachers than students experienced individual feedback. A rather small number - less than a half - of students and teachers declared that the way and time of giving feedback on one's learning outcomes was clearly stated. It leads us to the assumption that learners lacked some clearness in feedback on their improvement referring to their learning outcomes. This reveals the lack of teachers' preparedness for virtual mobility organization, having in mind that all the participating teachers were from traditional (not virtual) universities. Only about one half of the teachers indicated that they provided self-assessment possibilities for students, but students did not feel a lack of them and indicated the provision of self-assessment possibilities in the module.

Figure 3 *Methods of feedback used in the module*



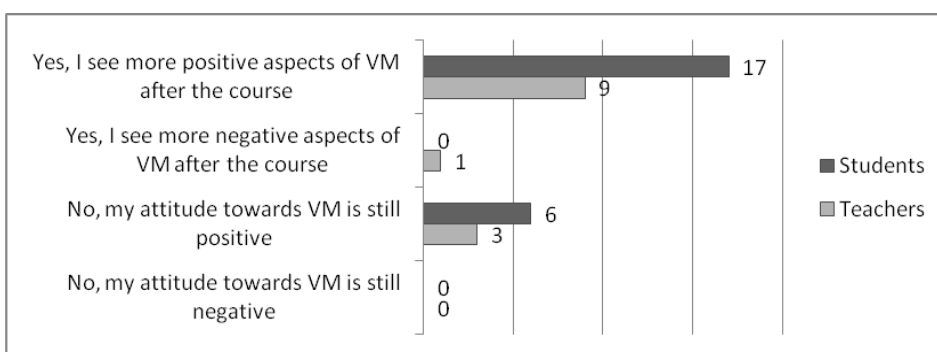
Although the virtual mobility experience was aiming at contributing more to the teachers' competences, their improvement is not possible if the students are not engaged. So while comparing student and teacher improvement in virtual mobility competences, a greater progress was seen in students' competences, as they spent the whole semester by virtual learning whereas the teachers were responsible for educational organization and lecture delivery only for 2 weeks. Some teachers commented that they would like to try teaching for more than 2 weeks of the virtual mobility course; they showed their interest in this form of virtual collaboration. Student and teacher improvement in virtual mobility competences and their comparison is shown in Figure 4. Some teachers admitted having not improved some of the competences while the students did it at least at a minimal level.

Figure 4 *Improvement of teacher and student virtual mobility competences (improved categories in percentages)*



The surveys also aimed at the identification of the participants' attitude towards virtual mobility after they had experienced it (see Fig.5).

Figure 5 *Changes in student and teacher attitude after virtual mobility course (numbers of respondents)*



The participation in a virtual mobility course helped most of the students and teachers to better understand the virtual mobility concept and its realization from practice. The experience allowed most of the participants to see more of the positive aspects of virtual mobility (indicated by 72% participants), whereas one fourth (25%) of the participants had not changed their attitude towards virtual

mobility, but it remained positive. Only one teacher saw more negative aspects of virtual mobility after the virtual mobility course.

As results from the previously implemented analysis in the virtual mobility participating institutions on virtual mobility practices, there were no legal restrictions for the virtual mobility of teachers and students at any of the participating institutions. The VLHE module participants, being the respondents of the students' survey, were asked if the module would be recognized at their institution. So none of the students and only one teacher indicated seeing no restrictions for module recognition, but some students and half of the teachers were still not sure if the module would be or could be recognized at their HEIs. This indicates that virtual mobility accreditation and recognition is an institutional decision and it requires more coherent institutional awareness and guidance for administrative and educational departments to implement it. VMCOLAB project initiatives focus on the institutional awareness and students guidance issues (for more information, please see wmcolab.eu) while UBICAMP project (for more information, please see <http://www.ubicamp.eu/>) intends to mainstream virtual mobility at participating institutions by suggestions of comprehensive solutions to virtual mobility barriers.

To sum up, the comparative analysis of the students' and teachers' answers revealed, that all the methods and tools of communication and collaboration were more or less important while working in an international and intercultural virtual environment; as well as giving feedback to students – teachers indicated that they gave feedback to students in a variety of forms, but fewer students answered that they received feedback. As students spent more time learning than teachers teaching, students' virtual mobility competence improvement was greater than that of the teachers. Virtual mobility recognition possibilities indicated by the module participants were uncertain, varied between higher education institutions, and called for a more strategic approach on the side of the participating higher education institutions.

4 Conclusions

1. The existing initiatives, practices, and empirical research results acknowledge the fact that not only face-to-face academic learning is valued and that universities not only create knowledge, but they also build bridges between various cultures and create a new potential for the organization to offer an international experience for students and teachers. The reality suggests that universities, seeking to respond to the changes of the global economy, make their first steps and lack practice in organizing and implementing virtual mobility studies for those who cannot to leave the country, workplace or university due to various social, economic or personal reasons.

2. The competences of higher education teachers and changes in teacher training are also faced with the upcoming challenges and require more strategic improvements. Designing a technology enhanced curriculum and the organizational process of teaching/learning for the purposes of international virtual mobility should be based on a certain methodology and theoretical dispositions.
3. The comparative analysis of student and teacher answers from the surveys revealed that all communication and collaboration methods and tools were important when working in a virtual environment. The importance of feedback for students was noticed and highlighted. The research results proved that intercultural communication competences during the virtual mobility program were improved both by students and their teachers, but as students spent more time learning than teachers delivering, so the students' virtual mobility competence improvement was greater than that of the teachers. All the competences improved by the virtual mobility participants contributed to the improvement of internationalization competence as well.
4. Fair virtual mobility recognition possibilities inspire discussions for more strategic institutional collaboration and for a qualitative approach. Additional possibilities should be provided and diverse learning environments created. The improvement of intercultural or other virtual mobility competences emphasises the importance of virtual mobility in order to promote international communication and to develop one's communication skills through cooperation with people from other countries and cultures. It also has an impact on internationalisation in higher education institutions.

Acknowledgement. The paper is based on the findings of the comparative research study „Virtual Mobility for Teachers and Students in Higher Education“(Eds. Teresevičienė, Volungevičienė, & Daukšienė, 2011) and developments of UbiCamp: Integrated Solution to Virtual Mobility Barriers (Project ID: 526843-LLP-1-2012-ES-ERASMUS-ESMO) and VMCOLAB: European Co-Laboratory for the Integration of Virtual Mobility in Higher Education Innovation and Modernisation Strategies (Project ID: 527770-LLP-1-2012-1-BE-ERASMUS-ESMO).

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Support of Self-Criticism and Creative Thinking Based on the Use of ICT as an Alternative to Classical Education

*Gabriela Sláviková – Juraj Tej**

Abstract: The present period is characterized by a rapid development of ICT. The possibilities of using internet represent newer ways of communicating with many people, regardless of the distance. The development and the use of new technologies open up many possibilities for communication and education. The capability of using ICT, to teach pre-recorded principles, and to develop key competences of students has become one of the very important tasks of contemporary schools, both on the teachers' and student's side. One alternative is online courses.

Key words: ICT, managerial simulation, education, eLearning.

1 Introduction

The integration of information and communication technologies (ICT) into education in all schools and in lifelong education systems, with an emphasis on key competencies, information education, innovative educational strategies, eLearning, virtual educational methods, virtual universities, on-line learning, multimodality, etc., are considered a key educational priority within the framework of strategies and the framework of multinational documents, declared by the European Union.

The experience of teachers as well as scientists show a preference for activity based on learning – learning by problem solving, as a better and more effective way for the acquisition and knowledge employment. This context highlights the necessity of educational dialogue and the extensive use of methods based on creativity, activity and cooperation. Many of these approaches are supported by ICT, which simultaneously already markedly affect behaviour as well as educational content.

The authors - based on their own experience with learning through ICT have investigated how managerial participants in simulation courses respond to creative, supported learning. Part of the research was a comparison of research samples of university students from Slovakia.

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2 From the boredom zone to the comfort zone

2.1 Modern forms of education and positioning into comfort zone

The capability to use ICT, to implement learning on reassigned principals and key competencies of students' development are becoming one of the very important tasks of contemporary schools on the part of teachers as well as on the part of students.

It is important to integrate ICT into university preparation as well as into whole academic environment. There is no doubt that introducing ICT into the educational process is a necessity today; all the advantages of PC supported education, with its connected problems of nowadays, are:

- assurance of ICT functionality in school for a longer period of time, i.e. even after contract expiration, or expiration of the operational life of the ICT equipment. This task often requires a great (even superhuman) effort of school management;
- finding an effective proportionality between traditional education and education supported by ICT, so as to meet students' requirement and also teachers' psycho hygienic criteria;
- positive combination of results achieved by classic and by computer supported training;

according to Burgerová (2001) also:

- use of Internet,
- effective individualization in computer support of education,
- use of multimedia in the educational process.

Whether today or in recent decades, at home as well as abroad, renowned, famous but also obscure educational institutions increasingly offer different study types with influence of new forms, the realization of these is seriously affected by development in ICT area (Straková et al.).

For several years the Internet course “eEkonomia” has been used, authorized by the institution of Junior Achievement Slovakia (www.jasr.sk) which – similarly to different managerial simulation trainings offered by various grades of schools – has brought concrete results. Both products meet the highly demanding contemporary requirement - to make the education process more attractive (also through the use of ICT equipment since students can be overloaded by using ICT, both at home and at school). Similarly, it is important to consider the possibility of offering a high-standard business, economic and financial education based on “learning by experience” principles. Its implementation in the classroom as well as in distance education provides participants with an adequate comfort level and into a position that does not bore or stress them.

2.2 The relation of the comfort zone and state of flux of modern educational forms

Distance learning represents a challenge for students who decide to participate in it. Brundage, Keane, and Mackneson on the webpage of Idaho University have identified the basic assumptions of success in distance learning. They consider the most important that students feel a high responsibility for controlling the throttle of their educational process and for a successful participation in it which means:

- students must be aware of what they want to achieve - what are their goals as well as possibilities and the means available for their achievement;
- students must know their strengths and weaknesses in order to effectively utilize them in achieving success;
- also important is a sufficient level of self-confidence in order not to give up after the first failures;
- also critical is the role of the instructor/teacher and other members of the educational group who reflect problems and successes and thus help to identify areas in which it is necessary to improve their current performance;
- since the educational process is not run in a traditional way in a traditional space where trainees are in every day contact, it is necessary to provide an effective method of mutual communication within virtual classes;
- an indispensable part is self-reflection on the educational process – thus, we want to support a responsible attitude by trainees to the progression of their process (Brundage et al., 1993).

Education by means of ICT in simulation training enables students:

- to work with information in real time;
- to see the result of their creative work immediately;
- to try to work in area which is, in real business, very responsible and in case of failure is associated with high financial losses;
- to obtain experience with work in which a high competence is required;
- the re-enactment makes it possible to avoid mistakes and make the best of alternative solutions;
- the creation of alternative solutions supports their creativity and the perception of the need for erudite managerial decision.

The model of “comfort” and “stress” zones implies that during personal development everyone acquires skills, experiences (positive but also negative), maintains own behaviour and communication models and builds his own value chain. He also discovers his own goals and sense of life and thus creates a comfort zone (experience and safety zone) all around themselves. Everything included in this zone, is “absorbed and interiorized” by the participant (student) (Tej and Krasnodębski, 2009). When the student steps out from this zone into an unknown area, he actually steps into the area of growth/development. The

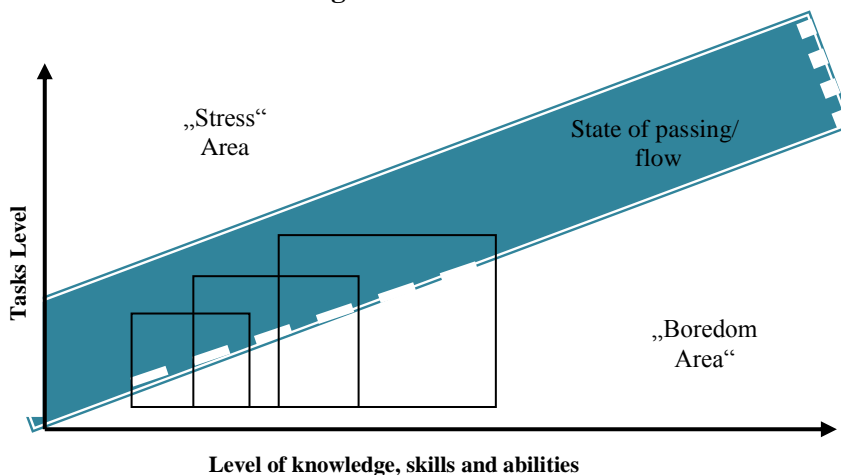
transition from one zone to another zone is for the student simultaneously “stimulating – troublesome – proactive”. A zone acts like a dynamic system.

When exposing the student to the risk of an uncertain outcome/result, the zone expands – in those areas which are under the teacher's influence and develop student's creative approach to the addressed issues. On the contrary, long-term non-use of any of the developed abilities or skills reduces the acquired level to the original value, even to the “boredom” area. The transition associated with the challenge of subjective “risk” (social, psychological or physical) which induces a positively motivating stress, is partially overlapped with the state of optimum survival “flow” (flux, stream, passage). “Flow” is a stage in which emotions are completely concentrated on the services of a particular activity connected with learning. At this stage, emotions are not only incorporated and expressed, but also constructive, full of energy and closely interconnected with activity.

The internet course author as well as the simulation facilitator must necessarily prepare them (the courses) so that: (Fig. 1):

- draw students out of “boredom” state caused by passive inert of ICT;
- positively exploit the student's embarkation into the zone of (positive) “stress” which has an optimal stimulating effect;
- keep the student as long as possible in the flow state which enables him to be at the same time creatively active and to study;
- repeated experiences with the course or during the simulation enable the students to use their own creative solutions.

Figure 1 The state of flow



Source: Másilka (2003)

State of flow occurs only when the specific activity fully employs all the participants' abilities. If the activity is too easy, people are bored. However,

demanding/difficult activity arouses anxiety. The state of flow arises somewhere in the area between “boredom” and “stress and mostly depends on facilitator's (teacher's) work. Facilitators try to keep students in this state for as long as possible. Repeatedly increasing simulated task difficulty increases the level of the participant's (student's) knowledge, skills, abilities and creativity – this induces a shift in his expertise and competence acquired during the course or simulation to a higher qualitative level (not only in professional activities - which is desirable in the contemporary process of education), but experiential pedagogic projects are also characterized by their impact on personality (Birknerová, 2010; Jurková and Ferencová, 2011; Ali Taha and Tej, 2012). The objectives of particular projects vary, they are as follows:

- development – acquisition of new knowledge, skills and development of abilities;
- reformation – acquisition of new knowledge, skills and development of abilities which students use to correct and improve the existing personal status (or the status of the group);
- recreation – entertainment, rest;
- creation of good informal relationships in a group - atmosphere, teambuilding;
- diagnostics – evaluation, recommendations, solution proposals;
- treatment – improvement/correction which runs on the basis of feedback alongside the empowerment by the facilitator – educationalist.

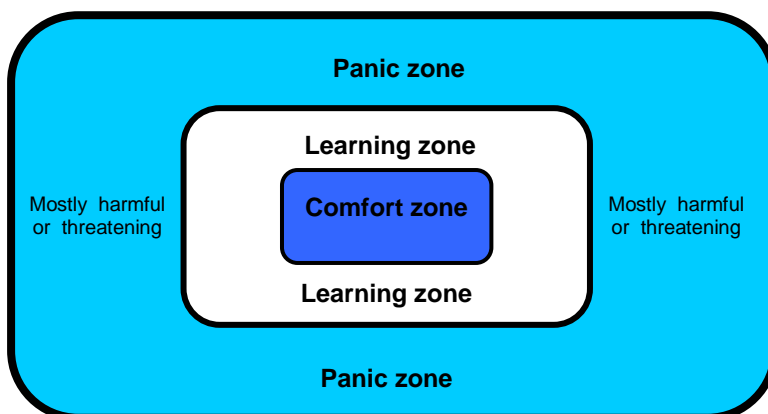
Educational internet courses most frequently “work” with the first two target levels, although it remains possible to reach also the next categories with rising ability development and problem solving. Courses and simulations should be built on the principles of success and on motivation cumulating in the next activity (whether during the course or later, in professional life). If for any reason a failure occurs or if too high expectations induce frustration, stress or blockage in an on/line course participant – (student's side), it means that the educationalist must have properly selected feedback. The student together with the educationalist strive to find a positive response to the problem and in successive steps look for an improvement. This approach is called “positive orientation to the mistake” (Brundage et al., 1993). Programs without any feedback element are not appropriate in the educational process.

Within the issue discussed in this paper it is possible to apply Tuson's model (Fig. 2) which consists of three zones:

- the comfort zone – a zone in which students feel safe; they know the environment, the people, as well as the operating principles. However, they learn nothing new; they work only on the basis of previous experience and knowledge; they have no need and motivation to change anything;
 - the learning zone – a space, where humans encounter actual boundaries of their abilities and skills while finding out that it is possible to develop them.
- Generally, it is about generating incentives from the internal or external

- environment behavioural change or for working according to the established rules. This segment corresponds with the flow zone in Fig. 1;
- the panic zone – crosses the threshold of the current possibilities of the person. In terms of learning it is not possible to “move” (advance) them anywhere because there is a risk of regression (recourse) which occurs due to negative experience and fear. This zone corresponds with the area of “stress” on Figure 1 (Balogová, 2009).

Figure 2 Tuson's model



Source: Balogová (2009); Tej and Krasnodębski (2009)

The space, which each of us has – including participants of distance learning courses or managerial simulation – is mapped in detail. To stimuli that affect us, we respond through memorized and proven procedures. We feel comfortable and safe in the comfort zone, nothing threatens us. In this comfort zone, we can theoretically all our lives and its limits are not even realized. Theoretically, it is possible to remain in the comfort zone all life and even not to be aware of its boundaries. In this zone a person resists news and avoids crises situations. Course participants, students, and simulation participants go outside of the comfort zone. They get beyond the borders of the known and unknown, “learned” and “brand-new”, “safe” and “risky”, i.e. go beyond their own comfort zone boundaries and temporarily leave this zone.

Stepping outside the learning zone is connected with new stimuli which participants are not accustomed to, and on which they may not have patterned behaviour. This situation could motivate participants to extraordinary performances, but it could also be uncomfortable and stressful. The method of coping with the novel situation to some extent determines the behaviour of participants in the future. If a participant steps out appropriately far, overcomes fears and stress and copes with the situation, they will usually feel very

comfortable. Thus the participant learns something new and widens their comfort zone. This may not always be about new knowledge and new terms; it could also be about obtaining an awareness of being able to do more, i.e. an ability to take risk, to be creative in an area which is unfamiliar.

Sometimes the abandonment of the comfort zone goes badly wrong and participants are not able to manage the situation – they are lost in the panic zone. Their zone of comfort has not expanded, but has even decreased.

It happens exceptionally that participant can handle the situation caused by stepping out from their comfort zone, but the experience is accompanied by such uncomfortable feelings that the participant does not want to experience it again. They usually realize and are reconciled with a fact that this direction is not suitable for them and the next time they avoid such activity.

Managerial simulations programmatically force participants to step outside their comfort zone. They uncover new possibilities in themselves which encourage them to step into the learning zone. Their goal is particularly an aspiration to self-development. The basis of work is positive feedback and the principle of transferred experience. If simulation or course participants are able to handle tasks better than they expected, it strengthens their decision-making in real situations, too.

This is, in essence, the alternative educational method, which through ICT equipment leads to new perspectives and creative thinking improvements, i.e. to the transfer of experience from the educational process to work as well as to practical life.

3 Methodology

Modern technologies create an open global information and communication space and set the teacher as well as the school into a new position (sometimes in a positive and sometimes in a negative meaning). Data, which are collated with opinions of graduates, were obtained in 2012 at the Faculty of Management of Prešov University in Prešov (the Slovak Republic) by a research questionnaire. The dependence between individual classification symbols was evaluated by means of quantitative statistics (e.g. contingency coefficients); consistency was verified by a Chi-square test.

4 Results

4.1 The experience of a real internet course and managerial simulation taught through the medium of ICT

Today, most educationalists look for opportunities to make the teaching process at school more attractive and try to offer their students a high-standard (business, economic or financial) education based on experiential learning methodology, offering the possibility of the maximum exploitation of students' hidden

creativity (which is often inhibited, underestimated or unexploited by traditional educational processes).

Junior Achievement Slovakia, NPO (JASR) is a not-profit-making educational organization. From its creation it has undergone several important changes. As an institution it was established (at his own request) by the Ministry of the Interior (No. 203/2-93/030004) as an international non-governmental organization. From 26th July 2008 it has operated as a non-profit organization: Junior Achievement Slovakia, NPO. It is a member of the world-wide network "Junior Achievement Worldwide" and European network "Junior Achievement-Young Enterprise Europe".

The Economic educational programmes of Junior Achievement have a long-term world-wide history which dates back to 1919 when a non-profit educational organization "Junior" was founded in the USA. In 1989, the programmes of Junior Achievement were offered in 15 countries around the world. Junior Achievement in Slovakia has been creating programmes (software) since the spring of 1992. Junior Achievement offers students and teachers programmes, textbooks and methodical materials as well as training courses for educationalists and volunteers, supplementary services and activities based especially on experience for free.

Several years experiences demonstrate that knowledge, skills and abilities which students obtain on the programmes of JASR properly fill the gap in students' practical school preparation at different school levels (elementary, secondary and higher education). The programmes provide educationalists practical and didactic tools for another type of students' preparation – helping them to decide on their future professional orientation using ICT

The organization decided to create an online course after several years of experience in teaching from textbooks and based on this experience and the use of simulation programs. The first textbook was a transcription of an original American textbook that had been properly prepared and offered the students sufficient study comfort. Although it was not a simple school subject (course) it did not force students into the panic zone - just because it exploited newly discovered creative teaching methods.

In 2001, authors Tej and Luticova were given the opportunity and were content to create - based on another original textbook – a new textbook with Slovak content and innovative materials. Textbooks entitled "Applied economy I. and II." are still in use and serve as an appropriate demonstration of alternative textbooks, in terms of methods of teaching (not content). The trinity of authors (Tej, Luticova and Skladanova) using the above mentioned textbooks, prepared an internet course with the official name of e-Economy – a virtual course in economic theory (Tej et al., 2001) which has been used from 2003 and has gained great popularity.

Managerial simulation training is a one-semester programme based on computer simulation in which students acquaint themselves with a simulated market

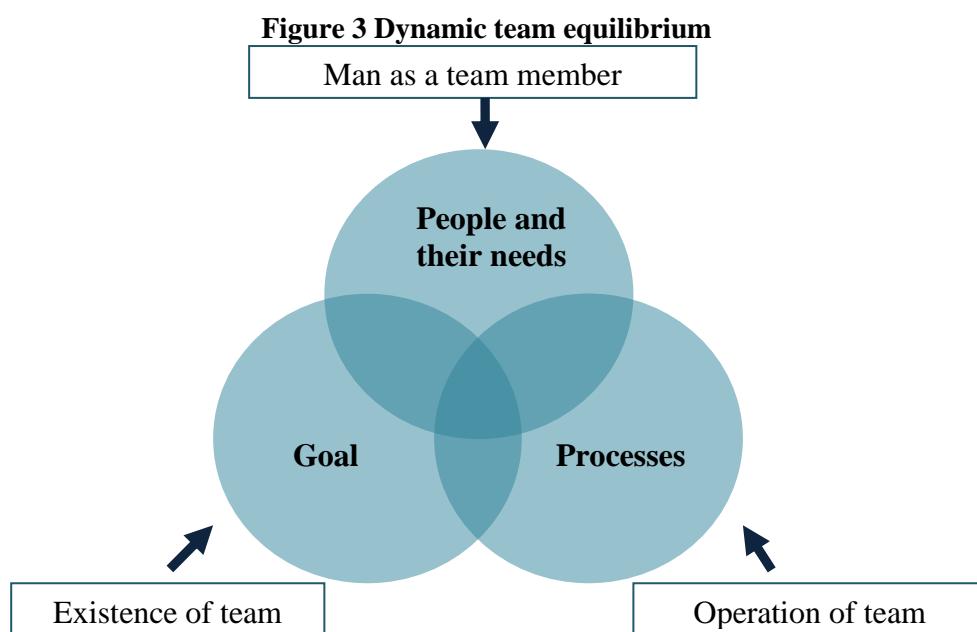
environment in a business area on a national and international level or with banking. The goals of programmes are simple, linked to the above mentioned internet course “e-Economy”. They are:

- to obtain experience from team work and team decision processes,
- to develop the students' ability to anticipate the consequences of their own decisions,
- to practice basic economic theory through the medium of economic experiment,
- to better follow economic principles and the regulations of market economy,
- to understand the connections between individual economic processes on a micro- and macro level and their mutual influence up to level of their consequent direct impact on the economic decision-making of a firm,
- to develop a creative approach in participants in economy and management,
- to improve the equality of higher education by using economic simulation programmes in the interactive creative educational process.

Titan is the name of an assessed managerial economic simulation exercise. It is a computer simulation in which 2 – 8 teams compete in the market in the production and sale of the same product. The programme enables you to add to the games another player generated by the computer (for students, it is a great pleasure and good feeling to beat such a player by their decisions). It is possible to change the simulation by setting various parameters, for example: simulation of expansion, recession, change of tax tariffs and interest rates. The responsibility of the students is to outperform competitors in profits, incomes and share of market. Managerial simulation exercises in a competitive struggle, give students the opportunity to become familiar with financial and accounting reports in a firms and branches and their interpretation. Competition encourages students to think about basic factors of production, marketing and financing and relate them to economic principles which they have learnt while studying economics at school. During the simulation they set prices for their products, determine the volume of production, plan a budget for marketing, research and development, and invest in buildings, machines and equipment. They also decide about investments in the local community, within their socially responsible entrepreneurship.

The ability to think and plan analytically is necessary for these decisions. Thus the simulation is not only a source of an emotional and exciting competition, but also a very effective pedagogic tool. If the participants are managers, the simulation becomes knowing/understanding the personal characteristics of oneself and of the team - especially increasingly difficulty simulated parameters. Education based on the projects of NPOs (non-profit organizations) is elicited from team co-operation in the classroom during the learning unit. It is possible to describe it following the British expert on management J. Adair, who emphasizes the need for balanced orientation of a group and facilitator on goals, processes and the personal needs of team members (Fig. 4). He draws attention

to the real negative implications of a standing long-time preference for one of the listed factors. Using of Adair's (1993) modified scheme, it is possible for the group to judge their behaviour not only during partial tasks, but on the basis of immediate experience it is possible to think also about the prevailing orientation in the educational process. Team members obtain their membership following their own choosing or following the teacher's/facilitator's decision. The basic need which they confront as a team in education IS the need for education. During simulations they can discover other needs, too, e.g. the need for success, the need for appreciation from the team, the need to demonstrate creativity, etc. These factors, together with other processes, create the very necessary balance in education using ICT methods, which have to fill a supporting role (and not to be a primary means of education, the basic educational element).



Source: processed and modified by authors according Adair (1993, in Atkinson and Flint, 2001)

If people in the working process correctly dovetail into certain predetermined formal structures, they play roles equivalent to their positions, work with various amounts of information and exercise various authority. In internet courses and in managerial simulations, the situation is absolutely different. The formal structure is not valid; an informal structure only starts to be created. Tasks are usually submitted to the group as a whole; information is identical for all; nobody has predetermined mandate to decide in the group's name. When modelling a

situation, it is possible to create a hierarchical structure in the group and to assign tasks to the leader. Then the teacher/facilitator can monitor how the leader aligns with their position and provide them with feedback regarding leadership style. In a specifically defined simulation, it is the best to solve problems in a natural group.

Specialists on the particular problems appear very rarely because unusual tasks are created and thus unprecedented for each participant (Svatoš and Lebeda 2005). In this situation, nobody is favoured (all course or simulation participants are on the same “starting line”). All have identical initial conditions and manifest themselves according to their natural dispositions. After a time, the uncertainty, chaos and tension within the group an informal structure start to form initiated by the new situation, and this informal structure does not necessarily correspond with the normal working hierarchy. For the facilitator as well as the teacher it is very useful to see them in such a situation – it is interesting to note and observe who the author of original ideas is, who the leader in creativity is, who the main “driver” is, who is able to analyse the situation, who can offer a proper frame for the group work and who is able to co-ordinate the activity of the team. After this observation it is clear who primarily is willing to present their own ideas even at the risk of possible failure; who is afraid of self-exposure, and who buck stands aside from action and only formally demonstrates their participation (which is very difficult to find on an internet course).

The way in which individual group members cope with an altered situation indicates markedly the state of the internal situation and the group culture in a company.

In an environment where there is trust, people easily release, are spontaneous, are creative and are not afraid to take risks, in general they support each other and achieve good results. Typically, there is immediate openness in evaluating their own work. They feel free to reveal and admit partial failures that serve as a useful source of guidance. Very rarely do we encounter a group where people humiliate each other. Such participants typically prefer apologetics, shallow expressions, a hostility to self-reflection – these people very often act as if they were the most perfect of people, who have nothing to improve. Even evident failures at solving task, they strive to present like a success, and possibly trivialize and ridicule the simulation. Through a variety of ways they try to escape from confrontation with their own mistakes which they cannot admit in front of other team members. If in simulations, they are looking for something, in most cases it is the maximum exhibition in front of others, not an opportunity for self-development. It is not necessary to speak about the atmosphere in the group. Fortunately, such groups are really seldom.

4.2 Research of creative methods perception among course and simulation participants

The disinterested reader might laicly assume that the essence of the creative approach in managerial games is the activation of creativity and original thinking in solving problems. Their goal is mastering creative and innovative thinking or to teach creatively to learn how to apply it in practice, in analysing and solving problems, which requires a heuristic approach because they are always to a certain extent new (claiming a creative approach and intuition). The importance of creativity, strategic thinking, the issue of the formation and management of the team and ultimately the impact of ICT allows the development and application of different entrepreneurial simulations, which are today also called management games, which offer a complex and detailed insight into the management of institutions (Kršáková, 2005). Management games are perceived as simulation games, supporting creative thinking and approaches which are one method of education based on quasi-realistic experiences (Hanuš and Chytilová, 2009). They are games that simulate hypothetical (but not unreal) business, economic or other environments and thus allow for active social communication between living participants on the principle “non-real – realistic”. Currently they are used not only as a tool for managerial knowledge, skills and competence development, but also as tool for education in scholastic environments. Creative games can be addressed to various groups of participants and can be used in their teaching practice as a means of practicing on concentration and creativity. Their content and timing are very diverse (Beermann and Schubach, 2009).

The importance of creativity was recently demonstrated by a meeting of the Council and the representatives of the Member States of the European Union on 22nd May 2008 on the promotion of creativity and innovation through education and training (Council conclusions, 2008). In its conclusions, the Council stated that creativity is the prime source of innovation, which is considered to be the main driving force of growth and wealth creation, and is the key to improving social policy and an important tool in addressing global challenges such as climate change, health care and sustainable development. Education systems at school level combine the development of specific knowledge and skills along with general skills related to creativity, such as curiosity, intuition, critical thinking, problem solving, experimentation, risk taking and the ability to learn from mistakes (Gorej, 2010). The Council emphasized the importance of collaborative approaches and a focus on the student in innovative learning environments. To put these ideas into life, it is necessary to have a positive attitude to the long-term orientation of the school policy and educational practice to creativity. The lack of creative approaches in vocational education in Slovakia has also been highlighted by other authors (Tej and Ali Taha, 2011; Ali Taha and Tej, 2012).

In connection with these identified problems, we decided to verify our claims through a survey among university students studying management and preparing for a managerial career (at the University of Prešov in Prešov). A questionnaire was used in the survey and snowball sampling as a way of infiltration - which is used when it is necessary to get as many respondents from a specific group as possible (Atkinson and Flint, 2001). Addressing and questioning respondents is carried out in such a way that after finding a satisfactory respondent, they are asked to recommended other suitable respondents until a satisfactory number of completed questionnaires is received. Infiltration by means described enabled the implementation of the survey among a specific group of respondents, which brought adequate results.

The survey was conducted in March 2012. Overall, 280 respondents were addressed while the respondents were participants of an internet course (at least one) and were familiar with managerial computer simulations (at least one). It was possible to use 271 filled questionnaires (97 % of all questionnaires) for processing results. The composition of the sample according to gender is shown in Tab. 1.

Male		Female		Sum	
Abs.	Rel.	Abs.	Rel.	Abs.	Rel.
105	38,75	166	61,25	271	100,00

Table 1 Structure of respondents according gender

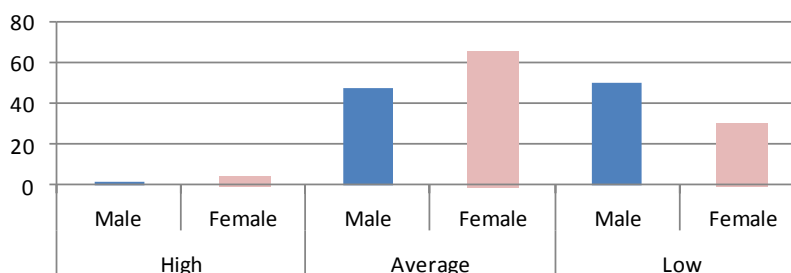
The structure of respondents corresponds to the current ratio of students studying management programmes. At present time women predominate in management faculties in Slovakia.

The following text shows some of the results of the survey. It was evaluated using seven questions which confirm the thesis and the conclusions that have been presented above.

The contribution of online courses (Fig. 5)

Students could express their opinions at 3 qualitative levels. The lowest level of evaluation (low contribution of online courses) was selected by only 3 % of respondents. The largest group, specifically 57 % of respondents evaluated the benefits of online course as average. 40 % of respondents perceived the contribution of online course as being high. Contingency dependence in the answers of respondents by gender dependence is high - 0.828 (Chi-squared 0.053 points shows no significance of differences by gender). The overall positive result (97 %) is a sufficient reason for the teacher to use this option in the educational process.

Figure 4 The contribution of online courses

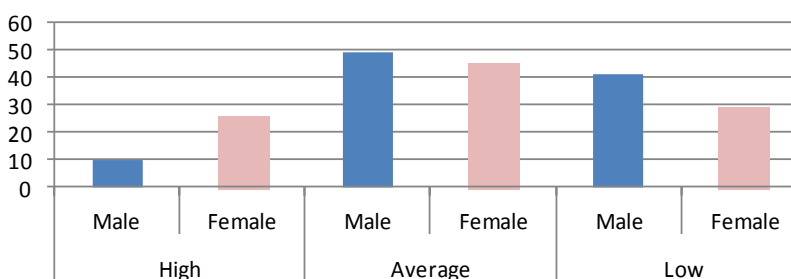


Source: Authors

Preferences for an online course with the participation of a tutor (Fig. 5)

We obtained similar results in the next opinion survey conducted on the internet course by a tutor.

Figure 5 Preferences for online course with the participation of a tutor



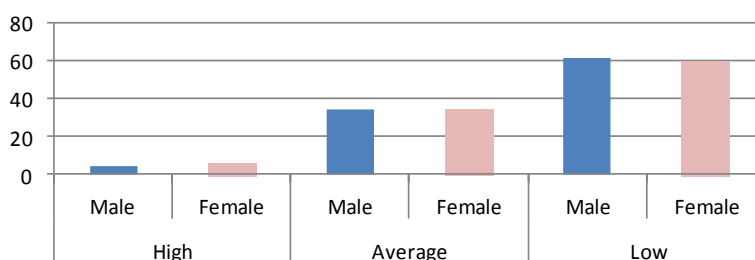
Source: Authors

In this case, the respondents could select one from three responses; hence the evaluations (low, average, high). According to the results obtained, students prefer the presence of a tutor on their courses. Gender contingency dependence is very strong (0,901), but X-square of the evaluation of responses indicates the statistical significance (0.003), which is certainly due to the different approaches and relationships to types of communication in both genders (female students probably prefer a personal form of communication). This finding supports the active management of the educational process even with the active use of ICT. Other questions in the survey were related to opinions on management simulations. They were mainly about their views on the interest, its ability to support creativity, and about the strengthening of the characteristics of the team and the opportunity to learn new features of their gaming partners - team members.

Perception of managerial simulations as interesting (Fig. 6)

Only 6 % of respondents at the Faculty of Management PU considered managerial simulations unattractive. The most frequent answer was “high” and hence for most students the managerial simulations were very interesting. There is no difference between the opinions (answers) of men and women (the dependence of opinion from both classification criteria is again strong; Chi-square refers to a statistically insignificant difference). Significantly the preference for using simulations as a tool for the development of managerial competencies for future work of students indicates the popularity of simulation programmes in today's world of ICT. It indicates the great popularity of managerial games for university students, for whom there is no problem in the availability of ICT and access to different game simulations in leisure time. It is therefore a confirmation of the suitability of the “learning through play” approach and preferences and creative approaches regardless the age of the participants.

Figure 6 Attractiveness of managerial simulations

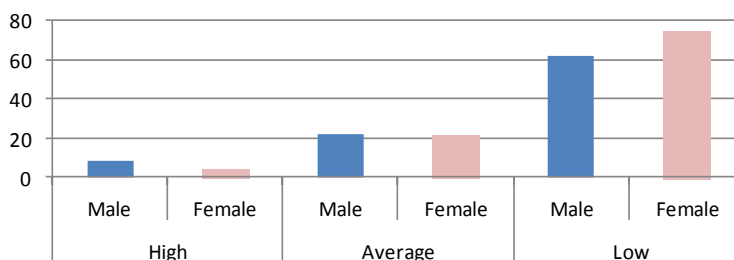


Source: Authors

Managerial simulation in terms of encouraging creativity (Fig. 7)

The results of the survey correspond to the proclaimed support for creativity in the educational system in the EU in that the respondents - university students - positively evaluated managerial simulations in terms of encouraging creativity. The result was the same as in the previous question relating to interest. The participating students realized that management simulation supports their creativity, women (naturally) more than men. This positive perception of the creativity support provided by managerial simulations is supportive for teachers who are in the business of educating future managers. Dependence of opinions by gender is strong (0.943) again and chi-square points to statistically significant differences between male and female students again.

Figure 7 Perceptions of creativity support in managerial simulation

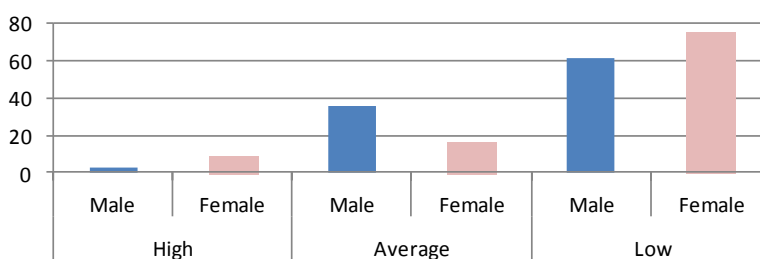


Source: Authors

Managerial simulations support team approach (Fig. 8)

Students work in teams during managerial simulations. This teaches them cooperation and brings their action closer to the real environment. There is a strengthening process of teambuilding; students learn to work together, to communicate with each other within the team; but discover also the problems of team working. Even when answering this question, there was no change of statistical indicators; dependence of opinions on gender was strong, the differences were not statistically significant, although at first glance it is to be seen that the feminine part of the population is more inclined to a team approach in problem solving than male students. We can say that students, prospective managers who have been through simulations supported by means of ICT, rate them as very suitable for strengthening relationships in the team and for teambuilding. Since today's modern trends in work currently require a team approach, the inclusion of practice-based simulation games are a convenient method of preparing for future employment.

Figure 8 Managerial simulations support team approach



Source: Authors

Managerial simulations allow learning new features of the game-mates

In this question, there was almost no change in the answers of respondents compared to the previous issue (that's why it won't be shown graphically). Statistical evaluation confirmed once again a strong relationship between classification features and opinions (0,972); the major differences were in the result of the Chi-square test, but they were also statistically insignificant differences (0.279). The diversity of opinions is statistically not confirmed. As in previous issues, there is a significantly positive opinion about the opportunity to learn new features. This result shows that suitably selected managerial simulations can also be used as a means of getting to know others (teammates) and can also lead to teambuilding.

5 Discussion

After evaluation of the responses to the questionnaire items selected for survey, we can conclude that creative approaches to teaching future managers through ICT methods (in the form of online course management and simulation exercises) is, in the minds of respondents, perceived positively. Similarly positive are their opinions on the attractiveness, creativity, the importance of creating the team and getting to know new characteristics of team players. This result also corresponds with the opinions presented by authors from other literary sources. There haven't demonstrated differences in opinion by gender; contingency dependency has been strong in all cases surveyed.

The correctness of the creative approaches trend in the educational process was confirmed; at universities it is naturally a process supported by means of ICT.

6 Conclusions

Successful electronic courses and managerial simulations create in the educational process a unique atmosphere that positively affects people's behaviour in both the short and longer terms. One cannot expect that the informality of contacts arising from managerial simulations (which naturally "begin to surface" from the character of collaborative tasks and from open and creative atmosphere) will fully survive a return to a classical environment. In different game situations some hidden personality features of each participant stand out.

Non-traditional forms of education undoubtedly lead to a deeper self-understanding and mutual awareness between actors. Based on our experience, we do not recommend an over-reliance on these new findings, especially not using them mechanically to compare the behaviour of different people. Simulations and courses do not represent the same burden for all participants. For one they are easy to handle, for another they can be stressful. It is necessary to consider knowledge from such activities as one source of information that

should always be considered in the context of previously known facts. The participants' expressions are mainly situational and therefore it is not possible to generalize about them.

It is necessary to realize that both the development and implementation of online courses, as well as practical work in the form of computerized managerial simulations that lead to learning and personal development, are very demanding, which requires facilitators (trainers, teachers) to possess professional knowledge and skills in the fields of management, social psychology, pedagogy and various other fields, and requires a certain degree of creativity, but especially, a significant degree of human maturity.

Educational institutions in Slovakia face the challenge of constantly updating their training programs in terms of content, but also the form of education. The changing society, changing educational requirements, the need for adult education in the form of retraining courses, skills training as well as the undertaking a course at a time that is most suitable for participants – these phenomena create the need for electronic courses and their wares. The possibilities of using online courses and support of the educational process can be different. It may be:

- consultancy support implemented through regular meetings (individual or within a particular group),
- e-mail communication between the tutor (lecturer) on one side and the students or whole group on the other side, in which they can advise each other or point out some problems and possible solutions.

Due the popularity of internet and e-learning courses, it can be stated that their use is currently behind their expected uptake. According to other authors (Hanuš, 2002; Másilka, 2003; Hanuš and Chytilová, 2009), we outline some of the causes and reasons for this situation:

- ICT implementation is dependent on the specific amount of funds of individual users – that's why the internet access (ensuring adequate provision of sufficient software for comfortable simulations) is from financial perspective often complicated;
- school managements, due to limited financial resources, cannot provide sufficient increased funds in real time for the material and technical support for education;
- the lack of motivation on any innovative efforts of many teachers, university lecturers not excluding;
- prevailing lack of institutional support, e.g. formation of professional teams of teachers and technicians;
- geographical distance between the student or course participant and the educational institutions.

Based on the authors' personal experiences, we can note that from the teacher's side the important factors in the educational process supported by means of ICT are:

- exploitation of creativity through the creation of a positive climate in the classroom;
- support of emotional expression;
- support of verbal communication (“live” lessons in a virtual classroom).

Despite the great declaration of the need for education via ICT support, the supply of online courses for schools and universities in Slovakia is still lagging. The perspectives on the implementation of online courses have their theoretical and practical upshot. Theoretically, under the action of the running flow the comfort zone is constantly growing. The practical results of an online course for students points to the disadvantages and reasons that cause some degree of insufficiency. Nevertheless, it can be stated that the popularity of such courses and the use of managerial simulations is for students – future managers – desirable and highly effective. That’s why the creative methods will have an irreplaceable place in managing education in the future. They are one of the teaching methods, which represent “learning through play” with a focus on the experiential form of teaching. In a nonviolent, effective (sometimes spectacular) way, the students develop the knowledge, skills and competencies that are needed in the current turbulent workplace.

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Acknowledgements

The article is part of the solution of the research grant project KEGA 017PU-4/2013 „Networking of selected elements of faculty structure“.

ARTICLES

Developing Language Literacy in the Educational Scene¹

*Judit Pazonyi – Edit Bodonyi**

Abstract: The empirical research the paper is based on was carried out in forms of workshops organized for groups of international teacher trainees between 2009 and 2012. The aim of these workshops was to master a “learning by doing” experiential model by which language literacy can be effectively developed or improved.

The topic is discussed in its complexity, highlighting some important issues of teacher training internationally, and also the still controversial situation of alternative education that tailors its curriculum to the pupils and students’ needs and facilitates such methods as the one the paper details on.

Key words: literacy, functional illiteracy, drama in the classroom, teacher training, alternative schools.

1 Situation in Europe

“*Mother, you had me but I never had you*”²: John Lennon’s well known lyrics is whispered together with the Hungarian poet’s lines: “*She just, giving me no look or thrashing,/Went on, and in silence spread out the washing*”³. Students are

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¹ The article is a revised and extended version of a paper written for a workshop on the CLIL method (see: https://www.google.sk/search?q=inauthentic&rlz=1C1CHMO_skSK506SK506&oq=inauthentic&aqs=chrome..69i57j0l5.2655j0j9&sourceid=chrome&espv=210&es_sm=93&ie=UTF-8#es_sm=93&espv=210&q=%22influenced+by+the+traditional+nursery+rhymes%22)

² *Mother* by John Lennon

³ *Mother* by Attila József

trying to catch and touch and embrace a person, but her face is covered and she is always turning her back towards them. At the same time a male voice can be heard: “*Bind us together / with a lock of your hair*”⁴. Now the students form a wide circle. A man is trying to get inside. He has been refused several times, but all of a sudden somebody takes him to the very middle of the circle. The others are getting closer and closer as if protecting him against all dangers. Now female voices start reciting: “*I am becoming my mother*”⁵, and the crowd of students now forms a circle again in which the young man and a young woman are embracing each other in the middle.

... ..

*The white paper curtains of a small, 90 cm x 60 cm x 50 cm size theatre rise. First only the rhythm of marching is heard, then suddenly the two-dimensional, tiny paper puppets of Christopher Robin and that of Alice’s appear on the stage. They are watching the changing of the guards at Buckingham Palace with their backs towards the audience. The guards start to come to the stage one after the other, in pairs. They grow in size to present that they are coming nearer and nearer. Simultaneously, reciting A. A. Milne’s poem, **Buckingham Palace** can be heard.*

... ..

The dramatic scenes above are from workshops organized for both Hungarian and international groups of early-, primary and secondary education teacher-trainees in Hungary and in countries, such as Austria, Spain, Britain and Belgium in the last few years. The participants of the workshops presented their interpretations of the poems through acting, transforming feelings and ideas into actions. The presented and practised method raises questions not only about itself but about education and teacher training. Besides detailing on the method, the other aim of this paper is to discuss some of these issues.

It is only Austria among the above mentioned countries where “Drama Education” course is compulsory in one term for early- and primary education teacher-trainees. In the other countries (Spain, Britain and Belgium, and also Norway from where students took part in the workshops in Hungary), there is no drama education in the curriculum for students studying to become early- and primary education teachers. No wonder that at the beginning of the workshop, before trying to follow the method that is detailed below, one student remarked: “This is Chinese to me.” In Britain, many teacher trainees take up drama courses, and there is a lot of research into the connections between English and Drama⁶, but the latter is not integrated into the training. Still for British students

⁴ *My mother* by Mahmoud Darvish

⁵ *I am Becoming my Mother* by Lorna Goodison

⁶ Last conference on “A dramatic-inquiry approach to teaching and learning” was organised by IoE London University, on 8th February 2013.; also see FLEMING, M., Christine MERREL, C. and TYMMS, P., *The Impact on Pupils’ Language*,

the workshop felt familiar. In spite of lacking drama experiences, most students found this experiential, creative, and multisensory method useful and interesting in developing the cognitive behaviour of young – and even secondary school children through working with nursery rhymes and other poems. These students from Belgium, Norway, Austria, the Netherlands, Spain and Hungary all agreed that they would love to learn more about similar approaches within the frame of their training to become teachers⁷.

2 Functional Illiteracy

For the last three decades, the term of functional illiteracy has been widely discussed, but an in-depth research of the phenomenon is still a long way to go. It is only recently that the *Telegraph* has come out with again two articles on the topic⁸ discussing the danger spreading in the English speaking world, in Australia and in Britain, but naturally the thorough investigation of the social, psychological, cognitive, and technical reasons is missing from these articles. The authors of this paper have no room here to find out about these reasons behind the problem either, but will offer methods that can develop imagination through which literacy could be improved, and try to call attention to those educational scenes where these methods might be available for children.

In Europe, the poor results of many EU countries of the PISA 2000 survey (Programme for International Student Assessment organized by the OECD), and those that followed it in 2003, 2006, and 2009, in which more than 40 countries were investigated, caught the attention to the phenomenon of functional literacy, the dangerous consequences of which shocked everybody interested in education, including experts.

Mathematics, and Attitude in two Primary Schools. *Research in Drama Education: The Journal of Applied Theatre and Performance*, 2(4), 177-197.; *Research in Drama Education: The Journal of Applied Theatre and Performance*, 2012, 17(1). , also: FRANKS, A. Drama in teaching and learning language and literacy. In: WYSE, D., ANDREWS, R. and HOFFMAN, J., eds., *The Routledge international handbook of English language and literacy teaching* Routledge. 2010.

⁷ Being a lecturer of Methodology of Teaching English to Young Children in a primary teacher training college, I was trying to find different ways of developing literacy in childhood, but in the curriculum there was little room for experimental methods, therefore mostly international workshops provided the scenes for them. (Pazonyi, J.)

⁸ <http://www.telegraph.co.uk/education/educationnews/9283222/Graphic-UK-children-more-likely-to-be-illiterate-than-Australian-or-Canadian-children-despite-higher-spending.html>,

<http://blogs.telegraph.co.uk/news/edwest/100160058/one-in-five-brits-are-functionally-illiterate-and-public-schoolboys-like-nick-clegg-will-keep-it-that-way/> [viewed 30 July 2013].

Among other objectives, the aim of PISA 2000 survey was to assess 15-year-old children's reading comprehension, and it turned out that approximately one half of the teenage population of the world have major problems in understanding reading. Isabel L. Beck and Connie Juel argue that "Early attainment of decoding skill is important because this early skill accurately predicts later skill in reading comprehension. There is strong and persuasive evidence that children who get off to a slow start rarely become strong readers (Stanovich, 1986). Early learning of the code leads to wider reading habits both in and out of school (Juel, 1988)."⁹ It can be added that although Krashen's silent period hypothesis (cf. Krashen, 1988) can also be applied to some extent for starting learning to read, facilitating reading (i.e. creating possibilities for it without any pressure to carry out the task) by developing children's imagination through story-telling, involving them in different actions, and also providing children with texts and pictures to cater the visual types, should be done from as early as possible, maybe even from the last year of pre-schools.

"Learning by doing" methods have been widely accepted in early – and primary education with their multisensory approaches for the last two decades. On the other hand, transforming reading experiences into drama activities by forming the text into two- or three-dimensional images (paper theatre, acting) is done only when there is a plot (a story) that can be rewritten into a dramatic text, however, lyrical poems are hardly ever acted out though imagination and thus literacy could be effectively developed by doing so.

At pre-school age, children's imagination is very powerful, but their experiences are relatively underdeveloped. When the pre-operational stage (cf. Piaget, 1997) is over at around the age of 6, growing experience increasingly takes over the role of the imagination. At this age, a child can already clearly distinguish between fantasies and reality, although the inter-changeability between the two spheres is still very easy for them. In Hungarian schools, teachers – with the aim of preparing children for the formal operational stage (this Piaget-coined term refers to the last developmental period from age 12 to adulthood) – mostly ignore the fact that lower-primary school children have difficulties in operating deductive logic, thereby forcing young children to explain most phenomena that come up at school and to use abstract concepts, such as grammatical or mathematical terms, instead of focusing on creative tasks involving children's imagination (cf. Piaget, 1997) may result in unnecessary stress, which can easily lead to learning problems.

Reading is a complex physical, cognitive, psychological and linguistic skill in which a balanced combination of language skills, memory, concentration and perception operate at the same time, thus creating the knowledge of decoding

⁹ BECK, I. L. and JUEL, C. The Role of Decoding in Learning to Read: a professional paper. In: *Scholastic Red* [online]. [viewed 31 July 2013]. Available from: http://www.scholastic.com/Dodea/Module_2/resources/dodea_m2_pa_roldecod.pdf

written symbols. Phonological awareness is considered the primary phase of reading. It is the recognition and manipulation of phonological units of words: syllables and rhymes. Typically, average children are mature enough to be able to learn decoding letters and the words written by them before they go to school. This phenomenon also underlines the early reading theory (Stanovich, 1986; Juel, 1988) discussed above.

The experiences in most European countries suggest that the poor results in reading comprehension do not stem from the pupils' lack of phonological awareness, but from their poor reading performance. Most Hungarian children can easily distinguish between letters, syllables, and words at an early stage but many of them have problems in understanding the complexity of texts. The main question for educators is therefore not how to develop phonological awareness, but how to improve reading comprehension. Experts should find out whether there is a delay in the development of abstract thinking following the development of phonological awareness, i.e. whether there is a temporal discrepancy between them, or if something is being done inappropriately in education, either before children go to school or after commencing it.

Owing to the fact that from the moment children attend educational institutions they spend more than one-third of their waking hours in them, they gain a significant part of their experiences there. Therefore, the curricula of these institutions should facilitate the procedure of getting to know the world as much as possible. Three-dimensional experiences are essential for pre- and primary school children to improve their memory and facilitate the achievement of the formal operational stage in the case of an average child at around the age of 12. The more experience they can gain, the more powerful the procedure could be.

Unfortunately, gaining physical experience is not at the centre of Hungarian education. Instead, verbal explanations based on deductive reasoning are in the focus, which, as stated above, can result in a lot of drawbacks, as the necessary cognitive skills develop much later. This can lead to manifold problems in and outside educational institutions. Such problems include disciplinary ones, lack of concentration, poor memory, lack of motivation, etc. This practice therefore is especially dangerous among children from families with poor social and educational backgrounds. Inward experiences are the results of the physical ones, and reading comprehension cannot be achieved without inward sensation. One of the priorities in education therefore should be the application of methods by which inward images that later can be connected to everyday experiences could be multiplied, thus developing abstract thinking vital to the future career of the child. Drama activities are the most appropriate means of this procedure.

3 Natural Texts

Working with texts always raises the question of authenticity. In this context, an authentic text is the one that is not created for language teaching purposes. The advantage of these texts is that they are not adjusted to speculative needs and therefore they can be more efficient in language teaching than most inauthentic ones if the content and form of the authentic texts are confirmed by the children's cognitive, social, physical and psychological experience (c.f. Pazonyi, 2008). Artistic texts, such as poems and tales, can be especially effective in developing communicating skills. The more powerful the artistic elements in a text concerning its inward world are, the more suitable it can be for developing listening or reading comprehension; this is the case already towards the end of the pre-operational stage around the age of 5 (and later, in the concrete operational stage), as developed abstract thinking is not needed to comprehend these texts. Folk nursery rhymes are artistically powerful and have survived for long centuries owing to their paradox of "perfect imperfection", which means that, at first sight, they are extremely simple and lack some very basic information which would probably be necessary for an adult to understand their elements thoroughly. Guy Cook argues that no matter how vague nursery rhymes are, "behind the pleasure which children take in rhymes may lie a more serious role in the acquisition of spoken language" (Cook, 2000, p. 26). Whether this argument is true or not, is beyond the scope of this paper, but it cannot be denied that children have enjoyed the same texts of nursery rhymes for centuries, independently from their social and educational background. These texts are often characterised as imperfect and simple. But what does this imperfect simplicity mean? Their imperfection means that they might be fragmentary, and their simplicity refers to their attribute of being organized around one feeling or idea. But they could not have survived for long centuries if they had lacked complexity. Texts, such as those of nursery rhymes or folk tales, and also poems, stories written by different authors, which prove to be lasting for generations of children, can be called "natural".

The terms "nature" and "natural", as basic characteristic features of an approach to language development, were first considered as vital, in the "natural" or "direct language learning method". This method was based on mechanical observations of the baby picking up its mother tongue. Although the subconscious process of language acquisition (cf. Krashen, 1988) was neither mentioned nor considered at the time the "direct method" was established (1900s), it was a significant step in introducing "natural" and "nature" as terms in language education. (Rousseau used the terms two centuries before that, but not in the context of language development.) From the invention of the direct method onwards, natural cognitive processes have almost always been present in language learning methods and techniques.

“Natural learning” has recently been developed as an alternative approach to traditional education. Without going into detail or commenting on this relatively new approach, the demand for learning methods that are developed in contrast to most institutionalized forms of education cannot be totally ignored, especially being aware of the fact that the traditional school systems in many countries still alienates many children from institutionalized education.¹⁰ This is especially true in foreign language teaching. Although communication is a natural behaviour for human beings, learning experiences often become obstacles to making progress in learning languages. The main reason for this has its roots in early or primary school education in which children are often forced to operate with abstract notions instead of communicating naturally. In early childhood the focus should be on natural processes, as most children in their developmental stage (till age 12) are not mature enough to understand grammatical systems – not to mention that an average child lacks intrinsic motivation for language learning. However, children communicate happily under circumstances motivating enough.

Simplified, inauthentic texts can be probably more efficient in language development in short-term, but they can hardly stimulate subconscious language processes. According to educational experience the proverb “*Easy come, easy go*” applies to learning: the less cognitive effort we make, the longer it takes for the information to reach the long-term memory. According to the psycho-analytical approach, the symbolic context of these texts is in accordance with the symbols of human thinking and understanding.

These texts are “natural” because they describe the basic ideas and feelings in archetypical ways in their complexity and their simplicity. They are characterised by binary oppositional compositions, and values of mankind are described in them often in accordance with magic thinking. These are the most important features that have made nursery rhymes, folktales and legends an important part of national cultures, the experience most children come across from an early age and generations pass these pieces on to those that follow them. It was probably not by accident that the British published the first collection of nursery rhymes as early as the 18th century (*A Little Pretty Pocket-Book*, 1744). From that time onwards, the oral tradition was gradually taken over by the written one, thus preserving archaic forms of the poems and influencing other areas of literature. (English literature is highly influenced by traditional nursery rhymes. Well known examples are Carroll’s children’s books or the title giving and constructing method in Agatha Christie’s books.)

When creating dramatic texts from nursery rhymes, the main question is which elements can be transformed into drama. This is a paradox question in itself, as the word “drama” originally means “action”, presuming there is a plot that could be acted out, which is not the case in lyrical poems that express feelings and

¹⁰ This phenomenon created partly the demand for alternative schools (cf. Bodonyi, 2012, pp. 15-24).

ideas but have no plot or characters. Lyrical poems usually have a very complex polyphonic structure of outward- and inward visual, aural elements, time structures, and linguistic elements that can be transformed into drama activities.

4 A poem dramaturgy method based on poetic texts¹¹

Being a complex method that requires some knowledge of children's literature, poetics, drama education, and methodology of teaching different subjects in primary schools, it can be stated that even the attitude to this kind of holistic attitude to teaching is missing in most of the teacher training curricula in European countries. Still the method can be mastered through some guided practice.

The method is built from different stages that are organised upon one another in a strict order. It is useful to start the introductory drama activities mostly with non-verbal ones to create an atmosphere of trust in which further discussions and acting can take place. These short activities can be followed by a discussion based on guided questions and tasks that facilitate an in-depth comprehension of the text. When teachers or teacher trainees learn how these worksheets can be compiled, they should have some semiotic, poetic knowledge by which a deconstruction of the texts into these tasks can be done. The questions and matching tasks on the sheet are to facilitate an in-depth comprehension of the deep structures: visuals, acoustics, time- space- and language structures of the selected nursery rhymes. The third stage is sharing the findings through group discussions. It is an extremely important and entertaining part of the method guided by the teacher, as at this point the participants realise two facts: 1) decoding texts differ individually to some extent, but 2) there are always signs that signify the same meaning within a context.

The fourth part is transforming the elements of the *natural* texts into drama activities. At this stage certain drama techniques are presented and practised by which visual elements, shapes, and other different compositions can be acted out. These non-verbal activities are followed by certain acoustic compositions of noises, sounds, and verbal structures. In the fifth part, the compositions of the former stage are built into a dramatic sequence that consists of clearly distinguishable elements. The sixth stage is a discussion again, in which the participants compare the texts with the dramatic presentation to check if the aims of students are clear and whether they are achieved or not.

The content and the order of the stages are the same, no matter whether the session is organised for young children or older ones attending secondary schools, or even teacher trainees mastering the method. Only the types of texts and the emphases on different tasks should be tailored to the different needs.

¹¹The title of the workshop was: *Developing the Inward Eye and the Inward Ear: Poem Dramaturgy*.

Teacher trainees certainly need discussions on the method itself apart from learning it by doing.

As stated above, this method involves a very complex combination of drama education, poetics, semiotics, etc., the second phase requires a lot of practice. Especially it is vital to learn how to create worksheets for different age-groups of learners and what could be given to pre-school children who cannot read or write but who have a rich imagination and can understand many things, for example: binary oppositional compositions, such as “sky” and “earth”, “light” and “dark”, “girl” and boy”; shapes, such as circles, squares; vertical and horizontal directions, and many other elements that these texts abound with. Although primary school children can read, their worksheets should be very similar to those of pre-school children, containing tasks of drawing and colouring, certain compositional exercises and funny problem solving activities to facilitate their drama activities with poems. The method can be used with secondary school children, only the texts should suit their cognitive, psychological, social, and physical needs (cf. the introductory lines about the workshop on poems about the relationship between a child and a mother).

Action rhymes and action songs provide many ideas for dramatization and acting. Any texts with rich polyphony (sounds, rhythm, images, etc.) can offer many more possibilities if creative imagination and understanding of the texts are promoted.

5 The expected outcome of the poem-dramaturgy method

Some poems are mini-dramas and are written in the form of dialogues, and therefore they lend themselves to dramatization. On the other hand, some poems are like other nursery rhymes: short and they usually have one simple, but strong emotional theme, which in this case, is more or less clear from the dialogue itself. They have powerful visual and acoustic elements, therefore they also have polyphonic structures which must be dramatized as if they were polyphonic tunes: (1) the outward and inward acoustics; (2) inward images of space, human beings, animals, elements of nature, objects as described in the rhymes; (3) inward time, outward time; and (4) the grammatical structure, all of which are those structural elements that must be performed besides acting out the dialogue. Other nursery rhymes are typical lyrical poems that are organised, as mentioned above, only around one feeling or idea. The verbal elements of the dramatization in these pieces can be transformed mostly from the outward acoustic structure (the one that is physically heard when the poem is recited).

Performing all the existing structural elements (see above) can produce an interesting three dimensional composition of the “dead” paper and printed text, and thus can make children participate in the sequence of actions, and share their otherwise inward worlds of aesthetic response to these poems. These complex

activities facilitate “learning by doing”: children can be part of the literary text and can understand features of it which, if dealing with them in traditional ways, would require fully developed abstract thinking, characteristic of older age groups.

Sharing the experience of the interpretation of artistic texts is one of the priorities of poem dramatization and performance in education. The didactic aim is to design a series of problem solving tasks for children, which can indirectly improve their inward sensation of space, movement and time, and also the recognition of outward and inward acoustic elements and the connections between them. To achieve this we have to clarify beforehand what we mean by space: rooms, nature scenes, streets, houses, etc. Talking about compositions with the help of certain visual aids is necessary. If the method is used with young children simple questions, such as: *“What is close to us?”*; *“What is far from us?”*; *“How do you know?”*; *“What is in the centre?”*; *“What is little, what is big?”*; *“Are there men or women in the picture?”*; *“What are they doing?”*; *“Is anything or anybody moving?”*; *“How do you know?”* have to be asked. Matching activities are also useful for facilitating the interpretations. While concentrating on doing such tasks one unconsciously gets absorbed in the text. The most important aspect is to start everything from physical experience to improve the inward ones. All these are especially vital in a world in which most children’s everyday experience is closely connected to the virtual reality.

When dramatizing lyrical poems, both the individual interpretations and the meanings that are shared can be parts of the dramatic interpretations, but the emphasis should always fall on the latter ones. It is more efficient if the tasks are done individually and later the interaction patterns are changed into pair-work and group-work as sharing and discussing experiences are as important as the performances. This procedure can develop children’s cognitive, social, and psychological behaviour. It is important that they see how many ideas they share, and also that there are individual differences. This can develop tolerance from an early age.

Poem dramaturgy and the drama activities connected to them belong to those complex, multisensory activities which can develop not only the targeted skills, but the whole personality. The problem with this, as mentioned above, is that the poem-dramaturgy method requires a complex professional expertise of the teacher, which can be acquired through practice. Another difficulty is that many teachers and teacher trainees are afraid of improvisations, without which these methods cannot work. Their reluctance often stems from lacking the necessary creativity, though according to experience, educators in schools providing alternative education are more open to these techniques and ideas.

In Hungarian teacher training programs, the focus is still on the theoretical aspects, and relatively little practical knowledge is provided, though pre- and primary school teacher training programmes involve much more practice than the ones for secondary education. In spite of the relatively conservative

educational system, alternative schools in Hungary always attract teachers who are willing to master less traditional approaches in education, and parents who insist on a more pupil- and student-friendly environment these schools offer to them.

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The Content and Language Integrated Learning Approach in Use

*Jindřiška Šulistová**

Abstract: The article briefly introduces the CLIL method and its use. The paper explains the terms hard CLIL and soft CLIL. Next, it deals with CLIL specifics, possible advantages and disadvantages. The competence and educational requirements on teachers are mentioned, too. This contribution also contains a sample lesson of recruitment.

Key words: CLIL, application, soft CLIL, hard CLIL, advantages, disadvantages.

1 Introduction

CLIL (Content and Language Integrated Learning) 'is a term created in 1994 by David Marsh and Anne Maljers as a methodology similar to [but distinct from] language immersion and content-based instruction. It's an approach for learning content through an additional language (foreign or second), thus teaching both the subject and the language. The idea of its proponents was to create an "umbrella term" which encompasses different forms of using language as a medium of instruction.' (Wikipedia, 2013). CLIL is a new didactic approach to teaching subjects integrating two features – linguistic and factual. There are two kinds of CLIL: the so-called hard CLIL and soft CLIL methods. Hard CLIL means that the subject or subject curriculum is taught in a foreign language. However, the main lesson objective is the content objective, not the language, while in the so-called soft CLIL form, the content of the subject is subordinate to the language goal. A higher emphasis is put on learning the language. Briefly said, the CLIL method employs the language to pass on the knowledge from a different (usually non-linguistic) subject.

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2 The history of CLIL

The CLIL method was used for the first time at the Jyväskylä Finnish University and also in the Netherlands in the late 90s of the last century. The countries mentioned above emphasize project-based learning when students (from their home countries and from abroad) work in various groups for one semester. As a consequence of the co-operation they are given the opportunity to work with people of different backgrounds and with different native languages. This fact enables them to get used to a wide range of accents.

The CLIL method is said to correspond with the process of being acquainted with the so-called lingua franca and uses it as a communication tool among nations in order to enable everyone to understand each other without having to learn many languages.

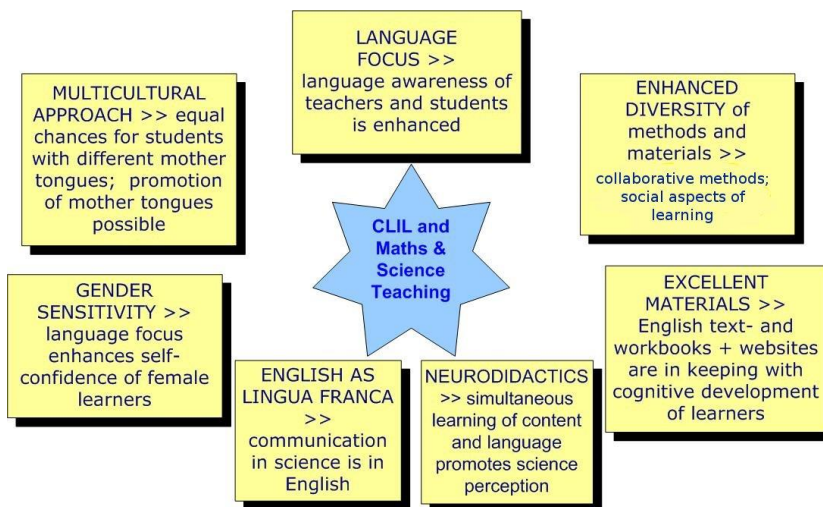
3 The application of CLIL

As it can be seen in the picture below, CLIL is supposed to develop some necessary competences in the current globalized world, such as

- A multicultural approach is to become more and more common in the current world and to live within one country with speakers of other languages with a different cultural background may be soon considered as a matter of fact. This approach develops communication across cultures.
- Students are offered real-life situations where they are to use English as a communication means and this makes them raise their awareness as to how the language itself is used, as well as cross-cultural awareness. The learners develop their immediate speaking skills with an emphasis on fluency.
- A diversity of methods and materials prepares students to deal with people from different cultural, language, and social backgrounds and to perceive the differences as a part of other culture that enriches them. It enhances teamwork and helps individuals to find their roles in a team. The use of various kinds of materials helps to develop learners' flexibility.
- Excellent materials offer up-to-date study resources available not only for teachers but also for students in various forms. These materials develop learners' orientation in online and printed information. Students are exposed to written and oral resources and, due to that fact, they become aware of different idioms, sayings and fixed expressions used in all sorts of situations.
- Neurodidactics supports ICT application in classrooms and the so-called brain based activities. Learners have the opportunity to learn about their learning styles (e.g. visual, kinaesthetic, auditory) within these kinds of activities and gradually work on developing skills.

- English (as lingua franca) is employed in the CLIL method in many states apart from those countries where there are more official languages (e.g. Luxemburg). Subjects can be taught there in other languages, too. The matter of English (as lingua franca) in the Czech environment is discussed in the monograph *Intercultural Communication* (Interkulturní komunikace) by Jan Průcha. He considers the option of other languages more suitable for central Europe, mainly dependent on the neighbouring countries which play a significant role in the selected country's economy. Students develop their skill to learn the target subject through a language (which is not their mother tongue).
- Gender sensitivity is dealt with in David Crystal's book called *How Language Works* where he says that gender in language has drawn a lot of attention due to the influence of feminism in the USA. Even new words are formed to respect both sexes, such as police officer instead of policeman/policewoman. Learners become aware of the current gender-related situation and therefore they avoid causing faux-pas.

Fig.1 *The CLIL Method*



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Another consequential feature is the emphasis on active participation of the learners. The teacher's role in the classroom is more concentrated on monitoring and assisting as Kalhous, Obst et al. (2002) recommend in the Learning Pyramid. This way enables the students to remember and experience more as their curiosity is boosted up by certain types of activities (e.g. brainstorming, mingling and matching, filling in the rest of a sentence or a paragraph, etc.).

4 Advantages and Disadvantages

CLIL as a teaching method has its advantages but it also has some drawbacks when compared with other approaches.

As for the positive aspects the following ones can be named:

- learning enhances critical thinking of students;
- the learning process is based on real life situations;
- leaning is based on teamwork (in some countries based on projects);
- raising the intercultural awareness of both students and teachers;
- increasing employability;
- breaking various kinds of prejudice and fear of travelling outside the home country;
- acquiring communicative skills and patterns (Metodický portál, 2013).

Possible negative aspects:

- a high level of time consumption for material preparation;
- students/teachers do not have the relevant level of foreign language knowledge;
- not enough information on the CLIL method;
- lack of motivation to use the CLIL approach;
- reluctance of using the method;
- training courses are not available on a regular basis (Comenius and Grundtvig programs organize CLIL courses during the summer holidays).

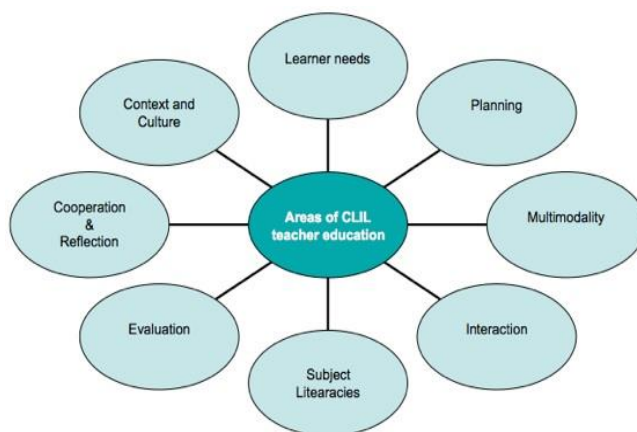
5 Requirements on Teachers

There are books describing the basic requirements for skills and competences of teachers using the CLIL approach (Bertaux et al., 2010; Marsh et al., 2010). These cover e.g. foreign language acquisition by non-language teachers, becoming acquainted with a certain non-language subject (language teachers), the role of teamwork during lessons, CLIL methodology, the way of assessment, how to provide feedback, dealing with multicultural groups, didactics in a multinational group, etc.

The best option for teachers is to have a degree in a particular subject (e.g. economics) and at the same time a degree in a second language; or a willingness to develop or deepen their knowledge from the other subject. There is also the option of the so-called team teaching, i.e. a language teacher cooperates with a subject teacher. However, this possibility is rather demanding for lesson preparation, communication between the teachers and, moreover, it considerably increases the financial cost of a lesson.

The figure below shows several areas (vast) regarding the CLIL education of teachers. A lot of fields are to be taken into account when implementing the CLIL approach, such as careful lesson planning, awareness whether the plans correspond with the subject curriculum or the learners' needs, to know how to create the context for efficient learning using lead-in and follow-up activities. Furthermore, a teacher ought to clarify the way of assessment and so on.

Fig. 2 *Requirements on Teachers*



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6 An Example of a Lesson of Recruitment in Economic Subjects

The topic of recruitment has been chosen for its variety of use in several fields (economic, technical, etc.). The topic can be used in both hard and soft CLIL versions, including some alternations depending on the main lesson objective.

This lesson has been designed for students of economic subjects. The class consists of approximately 20 students; seven of them are foreigners from Croatia, France, Turkey, Greece, and Kazakhstan. The level of English, concerning all students, is between B1 and B2 according to the Common European Framework of Reference for Languages. The students are used to working in international groups enjoying the national diversity as well as age similarity.

The main emphasis of the example lesson is on pair work or group work to enable students to acquire teamwork skills.

Recruitment

The first task for students is to brainstorm what areas the expression recruitment can cover.

The students are given the visual prompt below and they are asked to discuss the questions in pairs.

Secretary wanted

1. Think of the qualities a good secretary should have. Why?
2. Read the article and discuss in pairs what title would be suitable for each paragraph.

Good employees are hard to find. You place an advertisement and then wait for the applications to come flooding in. In a day or two, you're pleased to see the stack of applications waiting for you? How many are there: 100, 200? or more? Well done! What a response!

When you begin to look through the applications, you may feel disappointed. You think: Why did this guy apply? He doesn't have the experience you asked for. What? She's never even done this kind of job? Is this candidate joking? He probably chose the wrong advertisement.

To find and hire the best candidate is not an easy job. Most of the applicants won't have the required qualifications and then it is the matter of selecting the best of these. So what qualities are important when interviewing? The following qualities are most likely to appear on a list for consideration: hardworking, someone with positive attitude, experienced, initiative, team player, someone responsible and someone who is stable (Pettinger, 2011).

3. Answer the following questions.
 - a) Why is it difficult to find good employees?
 - b) What are the most common problems with applications?
 - c) What is the reason for making compromises when selecting new employees?
 - d) Do you agree with the listed qualities in the last paragraph? Would you add any?
4. Imagine: a) you are an interviewer and your schoolmate is an interviewee. Talk about:
 - Experience
 - Duties
 - Expectations
 - Possible questions

b) In pairs draft a structure of a European CV.
5. In small groups, find out the recruitment procedure in neighbouring countries and present the differences and similarities.

7 Conclusion

The use of Content and Language Integrated Learning is considered a new pattern in language and subject teaching as for integrating both parts (linguistic and factual) into teaching. Next, it responds to the needs of globalization and uses lingua franca as a means of communication within multinational communities.

The practical employment of this teaching approach is expected, although it is quite demanding for the participating learners and teachers. CLIL emphasizes effective learning outcomes, cognitive knowledge, critical thinking, and real life

use of a language in the subject's background. Learners acquire the basic structures for communication in a foreign language which is being developed.

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Neuroscience and Didactic Principles and Implications of Brain-Based Teaching and Learning

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Abstract: The article deals with the role of neuroscience in education. For educational purposes, it is crucial to know how the brain works as learning is a brain-based activity. In the article, the reader can also find the basic brain-based teaching principles.

Key words: neuroscience, neurodidactics, brain, learning, teaching principles

1 Introduction

“Neuro” is one of the dominant “trends” in many disciplines: neuromarketing, neuroethics, neurodidactics, etc. In the last decades, the insight into the brain has dramatically improved thanks to new techniques, which enable us to look into the living brain, not only after the death of a person. Brain research brings more and more results about learning, too.

The answer on the question “What do we have in our heads?” (Schachl, 2006) is very important for teaching and learning in general and for universities, too. Teaching and learning are brain based activities because learning is done by the brain.

To clarify the brain processes with learning, we have to deal with the following questions, “How do information get into the brain?”; “What is the role of emotions?”; and finally, “How is information stored?”.

2 How is information fed into the brain?

Gaining knowledge is an active process. For example, if several persons look at a picture, the background of the eyes (the retina) transforms the energy of the light into electrical energy in the nerve cells, which deliver this electrical information via optical nerves to the backside of the brain. There the information concerning edges, contrast, dark or light sides, colours, and angles is analysed.

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In all brains, it is the same until here, but sometimes there are big differences in the interpretation of visual information, as creating the real image is a mutual process of analysing and comparing with expectations, context, attitudes, available knowledge, etc. Perception is therefore a subjective, constructive process.

The dependence of perception on the individual leads to problems in human relationships, to misunderstandings between nations and even to wars. Everyone is convinced that the truth is on their side. The recognition of this subjectivism is important for teaching, educating, and learning, too; the reception of information depends on attitudes, education, environment, pre-knowledge, pre-information, context, structure, and, finally, on the whole personality of the individual (curiosity, interests, self-confidence, patience, controlling emotions, attention, readiness for cooperation, intelligence, motivation, etc.).

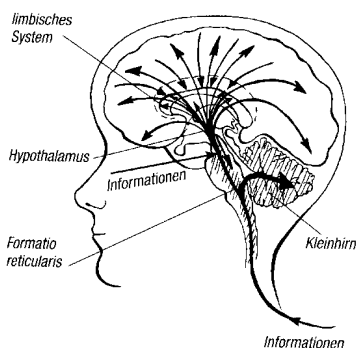
From the above mentioned, the following “basic principles of teaching and learning” (they are relevant for universities, too) can be derived (Schachl, 2006 and 2010):

- Overview before details
- Multi-sensory approach
- Take previous knowledge into consideration
- Contextual learning
- Interdependence of knowledge areas

3 How can the learner be switched to reception?

It depends on the attention whether information gets into the brain or not. What factors influence attention? Of course, it is a very important topic for teaching and learning. Attention is influenced by the individual’s expectations, interest in the topic, attitudes, context, but it also depends on the kind of teaching, presenting information in a suitable way, etc. For managing attention, a region in the depth of the brain – the reticular formation (formation reticularis) – is very important.

All kinds of information come either from the inside or from the outside of the body. All these stimuli travel via the reticular formation and are processed to the limbic system responsible for emotions; there is an impact on the autonomic nervous system (hypothalamus).



If the information is exciting, blood pressure and the heart beat increase, the hands sweat, etc. The cerebellum is responsible for a good muscular state (for instance of the head) in order to be able to listen carefully.

Finally, the cerebral cortex is consciously aware. This does not only mean attention is a conscious process, but that the deeper brain is involved very intensively. Therefore, for improving attention, it is necessary to do something for all these parts of the brain.

(Schachl, 2006, p. 55)

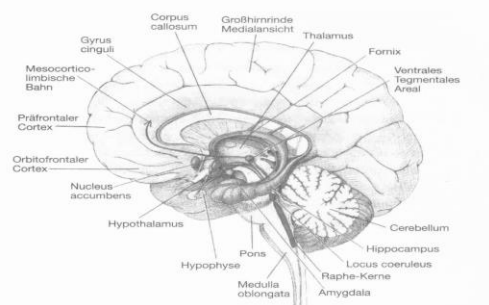
The following “basic principles” may help:

- Stimulate interest and curiosity.
- Teach attractively and in varieties.
- Teach with enthusiasm (“Enthusiastic teachers fill learners with enthusiasm”).
- Use different perception channels.
- Take care of conscious attention.
- Enable movement and breaks.
- Take care of feelings.

Especially the last one is very important.

4 The role of emotions

Rationality and emotionality are often discussed as two separate issues but such a separation does not exist in the brain. Therefore, especially for the purposes of teaching and learning, we have to look at emotions and cognition as working closely together.



(Roth, 2011, p. 323)

Feelings and emotions have a strong influence on learning. For emotions, the limbic system consisting of different parts of the brain is the most important structure. Some parts of this system are like “connecting links” between the cognition and emotions.

The amygdala (almond) is an emotional marker of contents on the way to the long-term memory and evokes anxiety, fear, and joy. It plays a significant role in recognizing the emotional signals in mimic expressions (Roth, 2011).

The mesolimbic system (nucleus accumbens, ventral tegmental area) is the central “rewarding-system and rewarding-memory” for motivation, interest, etc. (Roth, 2011, p. 444; Stuber et al., 2011). Therefore this system is very important for learning. The working chemicals are called endogenous opioids (endorphins) and dopamine (Rossato et al., 2009). The dopaminergic nerve cells (neurons) fire with expected and unexpected rewards but if expected rewards do not occur, the relevant chemical reaction does not occur either (Cohen et al., 2012, pp. 85-88).

The orbitofrontal cortex is responsible for controlling behaviour, moral and ethics (Roth, 2011, p. 45). The prefrontal cortex (PFC) is considered the center of the “working memory” (Wang, 2011) and also of intelligence. These interpretations of PFC as a „location“ is being criticised and the PFC is seen as a kind of “attentional filter” of memory (Wolf, 2009, pp. 56-61). The PFC is essential for introspection and metacognition, too (Fleming et al., 2010).

The hippocampus is of an utmost importance, this part of the brain is responsible for storing information in the long-term memory and also for retrieving (together with prefrontal cortex) and consolidating it (about 2 - 6 weeks after learning), but it is not the long-term memory itself. It acts like a working memory (Roth, 2011, p. 109; Miller, 2008b; Gelbard-Sagiv, 2008). Shortly, the reception of information is managed by the hippocampus and is followed by its consolidation by the prefrontal cortex. The prefrontal cortex and the hippocampus cooperate when retrieving information (Takehara-Nishiuchi and McNaughton, 2008).

It is a clear fact that if the hippocampus is damaged or it does not work anymore, one cannot learn anything new. It is, for instance, the case with the Alzheimer’s disease – these people ask you the same question ten times in half an hour because they cannot store the answer. They have a “moment to moment” consciousness.

The hippocampus has a double function; it is also important for emotions (Roth, 2011, p. 110), which means that emotions influence storing information and vice versa, the memory influences the perception and the retrieval of emotions. This double function is also evident in the chemical processes inside; for the entrance of new information into the long-term memory dopamine-mechanisms, controlled by a specific part of the hippocampus, are important (Rossato et al., 2009, pp. 1017-1020). Training and learning are also associated with changes in the density of the cortical dopamine receptors (McNab et al., 2009, pp. 800-802). The additional tasks of the hippocampus are as follows:

- The hippocampus (especially the right posterior part) plays an important role with spatial orientation which is developing with experience. There is an impairment of this task following the so called transient global amnesia (Bartsch et al., 2010). The hippocampus is also involved in action planning (Pastalkova et al., 2008).
- Parts of the prefrontal cortex and of the hippocampus are involved in the so called “reinforcing- and rewarding-learning” mediated by dopamine (Luo et al., 2011; Stuber et al., 2008).

Stress causes an increased release of the cortisol hormone in the hippocampus, too (Lederbogen et al., 2011). With long-lasting, chronic stress, cortisol impairs nerve cells in the hippocampus (Roth, 2011, 52; Kaouane et al., 2012) and so the ability to learn.

Emotions play an important role in teaching and learning at university level, too. Cognition and emotions are not separated; they work together even in the anatomical structure and via chemical processes. Positive emotions and the anxiety and stress reduction are a “must” in learning.

All learning is senseless if the joy is lost (Pestalozzi). Learning does not always have to be fun, joy can also come from the challenge and the reward after hard work.

Yet, teachers must keep in mind that anxiety and stress are adverse to learning.

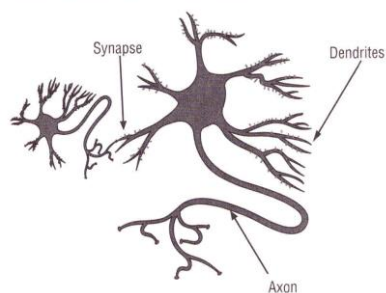
Based on the above mentioned, we can formulate the following principles for teaching:

- Foster positive emotions.
- Arouse interest.
- Involve breaks (especially for physical exercises) in the teaching sessions.
- Avoid anxiety and give advice for coping with stress.

5 How is information stored?

It is clear that memory does not work like a card box, computer file, or a CD-ROM. Trying to answer the question “How information is stored?” must be based on understanding of the functioning of the units of the brain, the cells. The power of the human brain can only be explained by the gigantic number of nerve cells. More than 100 billion neurons (15.000.000.000 of them in the upper layer, the Cortex) are interconnected, and in between these neurons there are double more glia cells. All the nerve cells work nearly according to the same principle – information comes into the cells via many nerve fibres (dendrites). The cell body processes this information and gives the result via one fibre (axon) to other

TWO NEURONS CONNECTING

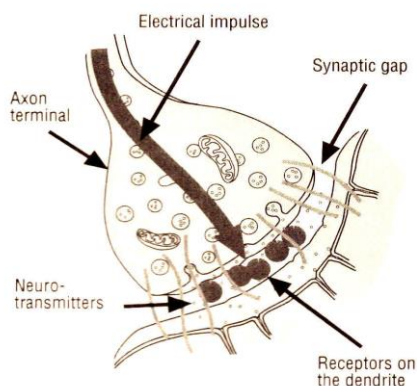


(Jensen, 2005, p. 17)

neurons. The connecting place between cells is called the synapse. The axon mostly has many branches, so that the information can be distributed to many other cells by 500 – 20.000 synapses per neuron that means more than 100.000.000.000.000 of them (Zimmer, 2011). This “one way” communication is a bit more complicated, because there is also communication between the dendrites, which is like a “tuning” for the neurons (Lazvin et al., 2012).

What happens with learning? Very shortly, learning makes the network of nerve cells stronger, thicker, faster, and more stable. In detail, it means that sprouting of dendrites increases the number of synapses, strengthens and stabilizes the synapses; and what is surprising and fascinating, there is also neurogenesis that means that new neurons are built (Berninger and Götz, 2009, pp. 58-63; Shors, 2009, pp. 41-48; Ma et al., 2009, pp. 1074-1077). Meanwhile, there is scientific evidence, that all this is possible even in adult age (Sahay et al., 2011). Of course, this “neuroplasticity” decreases with age.

THE SYNAPSE—WHERE LEARNING TAKES PLACE



(Jensen, 2005, p. 18)

For a deeper understanding of the neurobiological processes with learning, it is important to go deeper and to ask what happens inside the synapses, what makes them “thicker”.

At the synaptic gap, the information (via electrical impulse) is transformed into chemical tracers (so called neurotransmitters, e.g. glutamate), which transfer the message to the other side of the gap.

At the postsynaptic side, the receptors are opened by the transmitter, which steers a cascade of chemical processes for storing the information. Thereby the production of proteins is very important as memory is chemical. For exploring the processes at the synapse, Kandel (see Kandel, 2006) recieved the Nobel Prize.

Some findings show that at the postsynapse, there is no fixed position of receptors, but there is a “highly dynamic structure” with the possibility “to refresh itself rapidly” by an exchange of the used receptors against the unused ones (Silver and Kanichay, 2008, p. 183).

It is very interesting and complicated that on one synapse not only one transmitter can be released, but two, like dopamine (an excitatory transmitter) with GABA (an inhibitory one). That means that the balance between the excitatory and the inhibitory processes can be managed at cell level (Williams, 2012, p.178; Tritsch et al., 2012, pp. 262-266).

The processes are far more complicated because the GLIA-cells play a significant role in this game (Allen and Barres, 2009, pp. 675-677). The glia (with different cell types) is responsible for many jobs (nutrition, stabilizing, myelination, and immune-activities). Among those types, the oligodendrocytes are responsible for myelination, which is very important during the process of nervous system development (until the third decade of our life). Healthy myelin is essential to higher order cognitive functions (Nave, 2010).

Nowadays, there is an evidence that especially one kind of glia cells, the so called astrocytes, have an important function in producing and managing mental abilities. This makes sense in relation to the huge number of glia cells and also to the fact, that there is an interesting difference in astrocytes between humans and other mammals – astrocytes are much more complex in the human cortex than those of other mammals. The astrocytes seem to be involved in the synapse formation process, in axon pruning, synapse elimination, and in modulating synaptic functions through communication with neurons (Eroglu and Barres, 2010).

The classical form of long-term memory processing relies on some specific receptors (the so called NMDA-receptors) at the postsynaptic side. The astrocytes release – dependent on Calcium – the so called D-serine, which is a co-worker of these specific NMDA. A repetitive synaptic activity enhances the D-serine supply by the astrocytes which is a strong argument for repetition in the learning process (Henneberger et al., 2010, pp. 232-236; Santello and Volterra, 2010, pp. 169 - 170).

As for memory, there are some basic principles of teaching and learning:

- *Repeating* the learning matter leads to repeated electrochemical processes in the nerve circuits and strengthens them. The contents must be the same or very similar in order to reactivate them precisely (Xue et al., 2010).
- *Giving Feedback* is very important. It is always more difficult to correct what has been learnt than to learn it right from the beginning. In order to produce right chemical memory traces, it is necessary to give feedback as soon as possible. In case of positive feedback with *reward*, the strength of synapses is increased by chemical processes.
- Even the *prognosis* of a reward can have a positive effect (Stuber et al.,

2008).

- *Linking ideas and topics to structures* – memory consolidation can be fostered very strongly if an *associative scheme* is provided into which new information can be incorporated. So, teachers must underpin these processes by establishing schemas, patterns, framework, and structures.
- *Taking breaks* is necessary to give these chemical processes time to work.

All the mentioned methods and principles are included in the “overall principle”: the brain needs sense.

Teachers must keep the students motivated as the learners should be convinced that the topic is meaningful and they must understand the content. That means that teachers should give high-quality presentations with good visualizing, etc. And lastly, information should be integrated into associative networks, not presented as isolated facts.

6 Summary

The basic principles of brain-based teaching are (Schachl, 2006):

- *Present an overview before details.*
- *Use a multi-sensory approach.*
- *Take previous knowledge into consideration.*
- *Initiate contextual learning and show the interdependence of knowledge areas.*
- *Stimulate interests and curiosity.*
- *Arouse interest and teach attractively and in varieties.*
- *Teach with enthusiasm („Enthusiastic teachers fill learners with enthusiasm“).*
- *Take care of conscious attention.*
- *Take care of feelings and foster positive emotions.*
- *Involve breaks (in particular for physical exercises) in the teaching sessions.*
- *Avoid anxiety and give advice on coping with stress.*
- *Initiate repetition.*
- *Give feedback as soon as possible.*
- *Link ideas and topics into structures.*



(Schachl, 2006, p. 10)

Is there a real contribution of brain research? Most of these “principles” are “old teachers’ wisdom” but this knowledge of good, experienced teachers is now based and proved on brain-research findings. Therefore teachers cannot simply reject them arguing that they can choose the methods they want to use. These principles are not only “guidelines”, but they are the “basics”.

Brain research has made a great progress in the last twenty years, but nevertheless it is just the beginning. Of course, an interdisciplinary approach for exploring learning, including all kinds of scientific fields (linguistics, brain research, psychology, philosophy, etc.), is necessary. Research on the brain processes is important for improving learning, understanding contents, and in order to contribute to a better world. In the 17th century, Comenius formulated the need for education very clearly, “The goal is, that in schools (and of course in universities, too) there must be less noise, less frustration, less boredom, and no useless work, but more freedom, more joy, more happiness, and therefore more real success!”

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The Replication of the System of Conductive Education in the United States

*Andrea Benyovszky**

Abstract: During the 1980s, the methodology of Hungarian-created conductive education began its innovation in becoming an international model for working with individuals with physical disabilities. Its prevalence has increased around the world ever since. These international interests stimulated efforts to develop ways in which the discipline of conductive education (CE) could occur abroad and as a result, develop a worldwide network of practice. In the United States the first establishment of this international model of conductive education occurred in Grand Rapids, Michigan. Under the professional supervision of the András Pető Institute of Conductive Education and College for Conductor Training, (MPANNI in Hungarian), the Conductive Learning Center (CLC) was established in 1999, enrolling students to participate in the conductive education model and also serving as the laboratory school for the Aquinas College (AQ) teacher preparation program for earning the endorsement to teach the Physically and Otherwise Health Impaired (POHI). Currently, this collaborative program at AQ provided with MPANNI is unique in North America.

Key words: conductive education, András Pető, complex personality development, active learning, motor disability, conductor – teacher.

1 The Brief History and Present of Conductive Education in Hungary

CE is a holistic educational approach based on complex personality development. Its aim and, at the same time, its instrument is active learning built on intention and motivation, resulting in the overall development of the person living with motor disability.

The system of conductive education was developed in Hungary by András Pető, a physician and educator. He was the first person who did not consider a physical disability brought on by the central nervous system's injury a mere medical case, but a pedagogical and educational challenge. He viewed physical

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disability as a cerebral coordination disorder which could be influenced by learning.

He acknowledged that people living with multiple disabilities due to the injury of the central nervous system often display a complex set of symptoms. The symptoms gradually change and as a result, the motor, social adaptation, cognitive and communication conditions shift in a positive or negative direction. The conditions last a lifetime and determine the quality of a person's life. The disability not only causes the loss or disorder of certain functions, but also their disintegration. The holistic approach of conductive education interprets personality as an integral whole and does not break it into parts but with the help of a complex conductive program, develops it consistently and organically. CE approaches the individual in an integral manner, which influences every area at the same time (Hári, 1997).

András Pető laid the foundation of the conductive pedagogical system in 1938. He elaborated and implemented his method for children living with motor disability in 1948. Following a successful two year experimental period, the Hungarian government officially established the National Institute for Movement Therapy in Budapest under Pető's directorship. After his death in 1967, the Institute was named after its founder. Today the András Pető Institute of Conductive Education and Conductor Training College is the center of the conductive educational network operating in various countries of the world.

The Institute is part of the Hungarian educational system and its activity focuses in three areas.

1. Training conductors in the conductors' College;
2. Providing conductive education for the motor disabled with damages to the central nervous system;
3. Conducting scientific research in the area of conductive education.

2 The presence of conductive education in the United States

The first studies on conductive education (CE), soon after the early stabilization period in Hungary (1940s and 1950s), reached Great Britain and Austria and with the transmission of translated material, the reputation of the Pető method arrived in the United States as well.

During the 1960s and to this day, a number of individuals have felt that studying conductive education as a possible alternative method in the treatment of the motor disabled would be valuable. This was, in part, due to the ineffectiveness of Cerebral Palsy (CP) therapies. There were many initiatives, mostly from parents of children with motor related disabilities, to launch and operate conductive groups in the U.S. In professional circles, information on conductive education began to spread in the 1990s when Mária Hári and her colleagues,

invited by various American institutions and organizations, gave lectures on the subject. As a result, the July 1995 issue of "Infants and Young Children" was almost entirely dedicated to conductive education. A major transformation in the history of conductive education in America took place in 1999, when MPANNI's continuous professional presence began on the North American continent. This resulted in the launch of a conductive education teacher training program in the state of Michigan, which is based on the Hungarian curriculum and under the professional guidance of the Pető Institute.

3 The conductive education teacher program at Aquinas College

In 1991, The Dean of AQ requested that the Director of MPANNI participate in the development of a plan for a dual endorsement program that would provide students at AQ with both a Michigan teacher's endorsement for instruction for students with Physical or Otherwise Health Impaired needs and recognition as a conductive educator. A degree program to meet these objectives was created incorporating the theoretical and practice components of both the United States and Pető Institute perspectives. AQ financed the program and began the process of approval to provide the program at their site.

The goals of the collaboration between these higher education institutions were:

- to meet the desired need for conductive education within the United States
- to guarantee the maintenance of the integrity and fidelity of the conductive education method, and
- to expand the international network of MPANNI to North America.

The POHI/Conductive Education teacher preparation program at AQ introduced new elements to the traditional American special education teacher training model. The preparation program, based on the practices of MPANNI academic instructional practices, places special emphasis on the ongoing extensive application practice of students by working in a lab school setting. Laboratory school hours provide students with active learning opportunities, carefully structured to phase trainees into all aspects of teaching by gradually combining knowledge and responsibilities over time. Trainees have a minimum of 10 contact hours each week throughout their training, totaling 1050 hours prior to the student teaching placement. To provide the infrastructure for this application exercise to occur, the two institutions cooperated in establishing the Conductive Learning Center (CLC) to provide the laboratory experience.

The first class of conductive education began its studies in the 2001-2002 academic year at AQ as part of the POHI program. The curriculum included required laboratory hours of practice to be completed at the CLC. The overall curriculum consists of courses to address requirements for the certification in Michigan as an elementary general education teacher; those required for the

endorsement as a teacher of the POHI, and the required content and practice related to the conductive education method and related biomedical courses. Upon graduation and the successful completion of state required assessments, students receive the following:

- a BA degree Elementary Education teacher certification (K-5, from pre-school to grade 5)
- an endorsement to their teaching certificate to teacher special education/POHI grades K-12. and
- a conductor degree certificate.

4 Conductive Learning Center

The Conductive Learning Center (CLC) was established to provide the conductive education methodology for students with motor disabilities.

Originally, CE was brought to west Michigan by the efforts of parents of children with motor related disabilities in the summer of 1995. While two CE summer schools were organized by parents, they sought out AQ to take over the operation of the program in 1998. After AQ conductive education program was launched with the MPANNI and started, Aquinas appointed an independent board to operate the CLC as a financially independent arm of the college (2002). The college uses the CLC as a laboratory school for POHI student training. A strong sense of cooperation exists between the MPANNI, AQ and the CLC.

Staffing:

The staffing of the Conductive Learning Center is a combination of trained and certified Conductor teachers, professional staff and occasional volunteers.

The Executive Director of CLC is selected by the Board of Directors. She oversees the administrative aspects of the center and is not a certified conductor-teacher.

The CLC Program Director is a Pető Institute certified and experienced Conductor Teacher and is appointed by the MPANNI. She directs, supervises the conductive education program, schedules and organizes students and conductors' placement.

The Conductor-teachers include AQ-Pető Institute certified conductor teachers who are resident Conductor teachers and Pető Institute assigned Conductor Teachers.

Between 1999 and 2005, the conductors delegated by MPANNI provided the instruction of the conductive education program for the participating students and families. (The conductive education model does not utilize the skills of the physical or occupational therapist, nor the employment of a speech pathologist. The model incorporates addressing these needs of the individual student). The conductor-teachers participated in the practical training of current AQ college

POHI students with the guidance of the program director. Since 2006, graduates of the AQ POHI program and the conductors of MPANNI jointly provide conductive education duties.

Over the past 13 years, more than 60 Hungarian conductors have worked at CLC - for one to three four-week sessions with many returning on a rotating basis per their request and assignment.

The Media and Data Coordinator Prepares progress reports and student records, and creates database as needed. He creates digital photographic images and videos for student records and evaluation. He also collects and analyzes parent survey information. He is responsible for the creation of PowerPoint presentations about the program, as well as historical statistics and reports, for PR and visitor instruction. Finally, he assists with compiling pictures for the newsletter and special events.

Classroom assistants are conductor teachers in training and occasionally volunteers from the parents and community members.

Since becoming a financially independent arm of AQ, CLC has been working on strengthening and solidifying its financial base. CLC does not receive governmental funding for education, nor does it qualify for payment by medical insurance. The primary base of funding is tuition, fundraising, grants and gifts. Much of the money that is donated to CLC comes from local sources that often stipulate that it be used to underwrite the cost of Michigan students.

5 Families served by CLC

The Conductive Learning Center serves children from birth to age 26 with motor disorders related to complications of prematurity, Cerebral Palsy, Spina Bifida or brain and spinal injury. Since its inception, the CLC has served more than 500 families. The program serves 70-80 students annually. Between 1999 and 2011, 306 children participated in a least one 4 week session.

The program attracts families not only from Michigan, but from other states as well as other countries. Frequently these families move to Grand Rapids for the period of time necessary to participate in the conductive education program. The distribution of the students by gender and state is shown in Chart 1.

	MICHIGAN STATE	OTHER STATE	OTHER COUNTRY	Σ
RECEIVED CE	155	144	7	306
MALE	100	83	3	186
FEMALE	55	61	4	120

Chart 1 Distribution of children according to their place of residence and gender (at time of application)

The CLC operates continuous conductive groups for local families during the traditional school calendar year and within the same school year offers a system of intervals of intensive sessions (4-5 weeks long). These sessions are frequently accessed by students and families that do not reside in close proximity to the CLC. There are nine school year sessions that are four weeks in length and additional summer sessions are five weeks long.

Both the amount of time of a session and placement of the child are flexible depending on the individual status of each child's ability to handle the length and level of instruction.

6 Summary

By its very existence and success, the CLC meets the needs of children living with disabilities for whom the traditional physical therapy approaches common in the United States have not worked. The program's success requires the fidelity of the CE model is ensured. The unique partnership of the Peto, AQ, and the CLC does just that.

The implementation of a conductive educational program which stays true to the Pető principles is not an impossible dream. Though the work has been intense and extremely complex, the impact on the lives of the students served makes it all worthwhile.

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Correlation of Body Perceptions and Eating Disorders of 9-12 years old Children in Bratislava

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Abstract: The purpose of this study is to evaluate children in Bratislava, Slovakia. The survey sample consisted of 276 children aged 9 –12 who were tested using the Children's Eating Attitude Test as a diagnostic tool for testing young people, who show a proclivity towards having eating issues, a possibility of anorexia, or a possible problem with bulimic tendencies. The study analyses the components of the test and the scores of children to whom it was administered, and come to conclusions as to its usefulness in diagnosing eating issues in children between grades 4 and 6. It also examines the comparisons between the children in Slovakia and the children in Australian studies in order to see if the scores correlate and what similarities and differences are present between the two groups studied.

Key words: children, test, perception, eating disorders

1 Introduction

Body image discontentment has been linked to inferior psychological health and can pave the way for the onset of unhealthy, improper eating habits in puberty and later life. Described as disapproval of specific features of one's appearance, body image dissatisfaction occurs when a person's perception of his or her physical appearance does not agree with the qualities he or she would like to possess. Unless addressed, preteens' negative perceptions of their body are prone to cause eating issues during adolescence and in adulthood. Through this study, the factors that need to be addressed, with regard to body image perceptions in connection with eating disorders, can be determined. With the valuable data in hand, both the children's families and their school teachers will have a concrete basis from where to start educating their kids about the vital aspects of their health that correlates to their eating patterns. This can subsequently help the children to learn to differentiate between the realities of physical growth and the rhetoric of cultural representations of "ideal" bodies.

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Eating disorders, especially Anorexia Nervosa and Bulimia Nervosa, have gained an incremental public awareness in the past four decades or so. Needless to say, the steady increase in the number of recorded cases of eating disorders (particularly in young and adolescent females) triggered reactions from various social groups that advocate children and women welfare. As a matter of fact, research done by Steiner and Lock (1998) as well as Lucas et al. (1991) revealed that the incidence of these eating disorders has increased dramatically for the last 20 years without any evidence of abatement. Countless studies and research have also proven that examining the manifestation of certain eating disorders among children as well as adolescents, should be taken seriously since the age range of people with irregular eating behavior now extends to children in the early elementary school age, according to Bryant-Waugh and Lask (1995). The more alarming issue is that the prevalence of eating disorders among young and adolescent girls between 10 to 19 years old places Anorexia Nervosa and Bulimia Nervosa as two of the most common chronic illnesses of their age group (Stice and Agras, 1998; Lucas et. al, 1991).

For this reason, numerous studies have tried to determine the culprit(s) of these disorders and most systematic investigations found that the way media portrays the "ideal" body of a woman serves as the most influential factor. According to Spitzer, Henderzon, and Zivian (1999), as the media show advertisements featuring female endorsers with slim and skinny bodies, more and more cases of eating disorders among young and adolescent girls became apparent. Clearly, this is not a coincidence since the society's level of exposure to the so-called "western ideal" of thinness is highly associated to the number of young males and females who have eating disorder tendencies.

A lot of researchers also documented a strong association between the eating disorder development and the exposure to the western ideal of thinness. As a matter of fact, this association can be seen in both developed and developing countries. Becker et al. (2002) discussed, that the introduction of television and internet has paved the way for the increased occurrence of "disturbed" eating behaviors and attitudes among elementary school girls in Fiji, Japan. Presumably, this is due to their exposure to the "thin" ideal. The research of Unikel, Aguilar and Gomez-Peresmitre (2005) in Mexico confirmed a model in which having a body with excess weight increases the chance of body discontentment among young school girls. On top of that, the pressure to be thin as well as the internalization of the ideal to be thin also served as contributing factors to the development of eating disorders in Mexico. In the United States, the research of Groesz, Levine, and Murnen (2002); Cafri et al. (2005); and Stice and Bearman (2001) were only a fraction of scholarly papers which provided a strong evidence of the relationship between pressure to attain, awareness of, and exposure to the "thin" ideal and body dissatisfaction.

It is globally accepted that the main sufferers of the eating disorders are women, particularly young and adolescent girls. In fact, both anorexia and bulimia were

tagged as "maiden diseases". According to Neuman and Halvorson (1983), young girls back then were literally "dying to be beautiful" since the cases of Anorexia Nervosa alone recorded a 4% to 25% mortality rate in the early 80's. Although binge-eating, commonly known as Bulimia, was officially coined during the same decade, it instantly became a very popular eating disorder since it involved frequent episodes of excessive eating/drinking followed by exercising, purging, or compensatory fasting. Moreover, majority of the studies also showed that young girls and middle class women are more prone to these eating disorders compared to other classes.

2 Methodology

276 children aged 9 – 12 from Bratislava, who completed the children's version of the Eating Attitudes Test (ChEAT), reported whether they had ever wanted to be thinner or tried to lose weight.

The ChEAT appears to be valid and reliable as an early diagnostic tool at this time. However, it often requires further follow up using other diagnostic exams to verify if the score is high for a child. Research results show that the ChEAT can be considered as a primary diagnostic tool for eating disorders, yet if a child scores in the upper percentiles, other diagnostic tests can be used to investigate the disorder further. The question of the prevalence of the yearning to be thinner among the children in this study is critical. Another factor to be considered is what the division of this desire between males and females would be. The "Children's Eating Attitude Test" is often administered to children who have tried to lose weight or have complained that they feel too fat and are looking for approval from peers by becoming thinner. The children who displayed these characteristics score significantly higher on the ChEAT than children who are not displaying these characteristics. Dieting behaviors and the preoccupation with food in this age group can range from bulimia and anorexia to mild concerns about weight. The ChEAT is one of the ways to evaluate children in this age group for these conditions, however it is not meant to be a comprehensive diagnostic test for an eating disorder (Ontario Centre of Excellence for Child and Youth Mental Health, 2012). Nonetheless, it may be used to assess the children suspected of having disorders in their eating habits and guide their physicians and caretakers as to whether they need more intervention. Properties of the ChEAT test include 26 items that are rated on a six-point scale with six responses. Scoring the ChEAT is a matter of adding the number of responses on the test that are indicative of an eating disorder. The ChEAT includes three sub-categories for factor analysis namely: dieting, restriction and purging, and food pre-occupation, that were also factored in the original EAT test. ChEAT is a modified version of the original that delves into questions pertaining to the perception of body image, obsessions and

preoccupation with food, and dieting. After which, it then evaluates each of the 26 questions using a Likert-type scale. The Likert scale is a sum scale of alternatives to which a testee may respond by a circle or other mark on an item in order to obtain a score on a test. The ChEAT was reduced and simplified for use with children as young as eight years of age. No particular qualifications are specified for scoring or for the interpretation of the ChEAT, although the higher the score, the more likely the child is to have a proclivity to an eating disorder. Scoring on the ChEAT ranges from 1 to 156.

In this study, the survey sample were 276 children aged 9 - 12. They were tested using the ChEAT test. Directives for the test were given to the children orally and the test was taken as a written examination. The test had six answers for each item. The top three answers with high scores were “always”, “very often” and “often”. These three answers were scored 1, 2, and 3. With the scale being 0-78, a score of 20 indicated an eating issue with the child. It did not necessarily indicate an eating disorder; however, it would be an indication for further investigation. To investigate the perspectives and evaluate the behaviors that are common to eating disorders and weight obsession with children, the ChEAT was created as a primary diagnostic tool. The children reported whether they wished to be thinner or to lose weight.

3 Results

These results are comparatively similar to the first set of results verifying the validity and reliability of the ChEAT as a primary step in diagnosing eating disorders in the selected age groups for this exam. The interpretation should be cautious because the items do not distinguish between some normal childhood events and those that might be clinically relevant. Maloney et al. (1988) suggested that ChEAT scores of 20 or higher can be regarded as above threshold in screening for eating disorder.

The weight range in our study has a few significant elements. For males, the weight range is between 35 and 45. Females showed a greater discrepancy; while the heights remained generally in the same range, the weight ranged from 25 to 40. Percentages reporting various eating and weight-related behaviors were as follows: dieting 23%, exercising 62%, bingeing 24%, and vomiting after eating 3%. If compared to boys at risk (8%), a slightly higher number of females (15%) were, based on their ChEAT score, in the risk zone.

The results of the Australian research, as for the percentages, were similar to the results of our study. The similarity lies in the higher number of females in the risk area. Generally, children in the fourth grade scored higher than in grades five and six. In this study, all the children are 9 years old and their scores were fairly high compared to the correlation in the Australian study. The Australian evaluation reflected that girls were 28% above the threshold while boys were 9%

above. Similarly, the Bratislava study showed that more females (32 %) than males (11 %) were at risk. Based on the Australian study, the high risk scores were significantly lower for both 11 to 12 years old males and females, only showing a total of 3 at-risk scores when combined. This is in opposition to the high scores of nine year-old children mentioned in this study. "There exists little published research on the behavioral phenomenon of extreme "picky eating," or selective eating, in middle childhood" (Rolland, Farnill and Griffiths, 1995). These studies contribute to a positive change and further research will follow.

In this study, the correlation between BMI and at-risk threshold scores on the ChEAT tallied substantially with those children who scored higher on the ChEAT having lower BMI scores. This also correlates with other studies. In the Australian study, children who scored higher (in the upper quartile) of the test, reflected heightened concern about being overweight and their BMI scores were lower than of those who were in the lower quartile range.

4 Discussion

The results of this study resemble the Australian study which correlated similarly with studies done in Israel and the United States. Children in the younger categories show a higher risk for eating disorder and body image issues than older children. In all of the studies, there was a correlation between the ChEAT scores and their BMI. As the score increased, the BMI decreased in both this and the Australian study, which indicates that children in the high risk category were actively trying to lose weight or were concerned with their body image and were actively engaged in a weight loss activity ranging from anorexic behavior to dieting. A children's hospital says that Anorexia Nervosa is up among diet-crazed girls as young as 8 years old who are worried about their weight because of social pressure (Anorexia Hits British Youth, 1990). This study is significant as it is the first of its kind done in this area of the world. The correlations to other studies are indicative of a global response to younger children being intensely occupied with body image. Further studies need to be conducted with children on body image. As this study did not use visual aids, the ChEAT indications, BMI scores, and the loss of intense interest in body image as the children age, seems to be similar across the cultural boundaries. "Usually the onset [of an eating disorder] is during puberty, early teenage years, but it doesn't mean they are getting treatment at the onset of the condition" (Gillespie, 2012). More children need help because of eating disorders and this study is confirmation of that fact. As these studies come out, more people may seek treatment for eating disorders. Currently, "programs that admit and treat patients with eating disorders are more likely to emphasize a medical-psychiatric model of addiction, use psychiatric medications" (Weiss, 2007). Hopefully, this will prevent a long-term damage from eating disorders.

5 Conclusions

The research showed that there was a definite risk for younger girls to have body image issues, but boys were at risk as well. Geographical differences do not play a significant role in the body image issues that children encounter. The global issue of body image appears to affect children at a young age, as the results of this and the Australian study show. While more research is needed to discover how much cultural values and other factors may affect body image in children, at this point it appears that children are vulnerable and that age is the primary factor in this. Teens are likely to have body image issue, however, the age group that seems to be most affected seems to be the preteen group. The Likert is a useful measuring scale used in both studies. Other scales and tests, such as the MMPI, may give more insight in these issues. At this time, the Australian research results were confirmed and verified by the Bratislava study. Children as old as 8 years up to their teenage years should be monitored for eating disorders if they are low on the BMI chart and exhibiting behaviors that indicate that they are at risk of having eating disorder and body image issues.

Recognizing the specific factors that cause a child to suffer from an eating disorder is extremely important. Finding adequate solutions to thwart children's eating disorders at their onset can avoid severe health problems during their later lives. The best way to help children overcome inferior perceptions about their physical appearance is through adequate guidance from their parents. Making the child perceive weight gain as a normal part of growth especially during puberty and discussing media messages pertaining to body image can help children to accept themselves and to feel comfortable in their bodies. For teachers, the data demonstrate the need to increase the number of educational materials and instructions that teach children to take care of their health and to resist pressures that glamorize negative body perception and counterproductive lifestyle habits. Integrating lessons on positive body image and self-care into the school curriculum will go a long way towards helping kids to grow up with a healthy self-esteem.

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Didactic Means and Their Use at Technical Universities

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Abstract: The aim of this paper is to introduce the reader into the field of didactic means and their use by educators at universities with technical orientation from students' perspective. To check the status of the two selected universities in the Slovak Republic and one university in the Czech Republic, we conducted a research, which was attended by 194 respondents and its results are presented in this paper.

Key words: didactic equipment, didactic means, interactive whiteboard, slide projector.

1 Introduction

At technical universities, we have computer schoolrooms in which teachers have the possibility to use a computer, slide projector, interactive whiteboard and various didactic means. By using them in combination with presentation programs, information is provided to students.

Positive changes, which were brought by information sources, new information environment, information and communication technology (ICT), do not always correspond with the real ability to use information effectively. People need more than just information sources and tools, they seek for something that enables them to use information effectively. In the context of the information society, the need for information literacy and for basic information competence development are in the center of attention; informative knowledge, skills, possibilities, habits,

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and attitudes are important. The most frequently used and basic teaching aid is still the traditional textbook (Figure 1).

2 Teaching aids, modern education technologies, and didactic means

Teaching aids and didactic equipment are related to the principle of clarity in the educational process. Their importance can be shown in several numbers. According to Fridman (Turek, 2010), an average person remembers approximately 10% of what they have read, 20% of what they have heard, 30% of what they have seen in a picture, 50% of what they have seen and simultaneously heard, 70% of what they have seen, heard and actively performed, and 90% of something that they found out alone based on their own experience by the implementation of some activity. Teaching aids, modern didactic technologies, and didactic equipment have a unique position in the whole educational process.

2.1 Teaching Aids

Teaching aids are used to achieve the clarity of teaching and enable a comprehensive adoption of the curriculum. They can be classified into auditory, visual, audiovisual, cybernetic, multimedia, and hypermedia resources. In the educational process, teaching aids can have motivational, informative, application, simulative, repetitive, and control functions. The selection of an appropriate teaching aid can significantly increase the didactic efficiency. The most commonly used teaching aids are the traditional textbook (Figure 1), blackboard (Figure 2), and chalk.

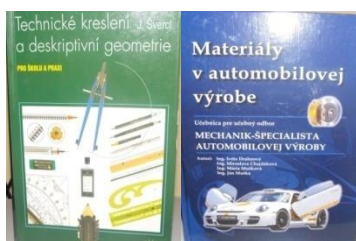


Figure 1 Textbook

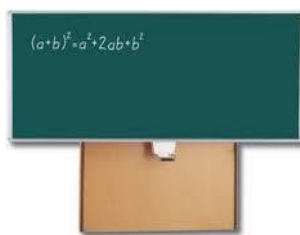


Figure 2 School table

A textbook (Figure 3) becomes interesting for a student, when it is didactically well processed, includes suitable figures and performs its functions. In technical areas, the use of teaching aids such as 3D models, figures, etc. is of a great importance as they enable students to imagine the real function of individual elements in the technical practice.

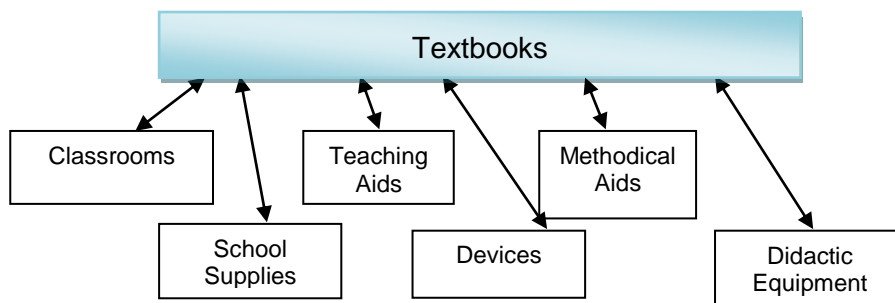


Figure 3 Central position of textbooks

2.2 Modern educational technologies and didactic equipment

The term of technology indicates technical means, processes and skills, which are used for specific purposes and which produce practical results (Hrmo et al., 2009).

The term technology is used as an equivalent to the term equipment in the case when it means the way of activity realization, respectively, some production ability (Hašková et al., 2012). With the expanding development of information and communication technologies, which offers high-quality tools for working with information and information sources, very efficient technical educational means are getting to schools. This means a large modification in the working process and high requirements on the level of teaching staff knowledge.

Schools in the information society, due to their broad mission, should offer complex education. The competencies needed for living in this society are called information competencies. These competencies can be obtained and developed through e-learning, too. E-learning is a form of distance education. At the same time, it is necessary to add that, with this method, the personal contact between the teacher and students is not needed.

Another example is the use of a PC in combination with a slide projector and projection on a screen. This method of mediating the subject matter is provided by interactive whiteboards. It combines the benefits of the classical blackboard, touch screen, and PC. The easiest and the cheapest way is the use of eBeam boards in the form of a digitalizer that scans the surface up to 1.6 x 1.2 m (Figure 4). It is possible to connect a control panel to an interactive whiteboard which includes presentation and control functions for the audiovisual equipment of lecture rooms (Figure 5).



Figure 4 Interactive whiteboard
eBeam

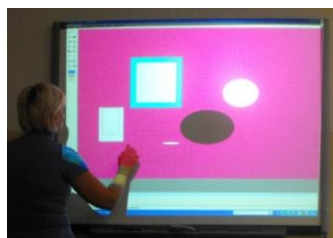


Figure 5 Interactive whiteboard

Source: Hašková et al., 2012

The benefits of interactive whiteboards lie in mediating the subject matter, paying more attention to the selection of the subject matter, the use of an infinite number of boards, writing with a finger or with a special pen (Vargová et al., 2011, Hrmo et al., 2009, Depešová et al., 2010).

2.3 E-Learning

Education is one of the most important life priorities of each of us in a modern society (Kučerka, 2011). E-learning is an alternative form of education which has recently experienced development; it is one of the possible forms of further education.

E-learning in our conception includes the theory and research as well as any real educational process (with varying degrees of internationalism) in which information and communication technologies are used in accordance with the ethical principles of working with data in their electronic form. The use of ICT and the availability of teaching material depends mainly on the educational objectives, the content, on the nature of the educational environment, and on the needs and possibilities of all the actors of the educational process (Zounek and Sudický, 2012).

Education through e-learning is a process based on the interaction between students and a teacher. This method of education requires key competences in the field of computer technologies and communication via internet. Among the advantages of conducting e-learning courses we can mention saving travelling costs and time. The disadvantage of such courses is, for example, the lack of personal interaction between the teacher and students.

3 Research and evaluation of didactic equipment use on vocational subject lessons

The survey focused on the range of the didactic equipment use on lessons of vocational subjects was carried out at three universities that were technically oriented in the Slovak Republic (two universities) and in the Czech Republic (one university) by means of a questionnaire.

3.1 The survey on the use of didactic equipment on vocational subjects

To find out the extent of the use of didactic equipment on vocational subjects at technical universities, we have constructed a questionnaire with six questions. In the first question, students' task was to characterize the didactic equipment used on their vocational subject lessons. In the second question, they were asked if lessons, on which didactic equipment was used, were more interesting for them than the traditional ones. In the third question, we asked the respondents whether they were engaged with the educational process when didactic equipment was used. In the fourth question, students answered the question if the use of didactic equipment on lessons made the lessons more efficient than just taking notes by students. In the fifth question, the participants had to decide if they remembered more from lessons when didactic equipment was used compared with classical lessons. The final question was focused on finding out which didactic aids had been used on vocational subject lessons. Students were asked to indicate their answers on a 5-point scale – yes (+2), rather yes (+1), I do not know (0), rather no (-1), no (-2). Questionnaires were completed by 194 students (table 1). 149 students were from two universities in the Slovak Republic – Dubnica Institute of Technology in Dubnica nad Váhom (DTI) and Constantine the Philosopher University in Nitra (UKF) and 45 students from the Czech Republic – Institute of Technology and Business in České Budějovice (VŠTE). The questionnaires were administered and evaluated in March and April, 2013.

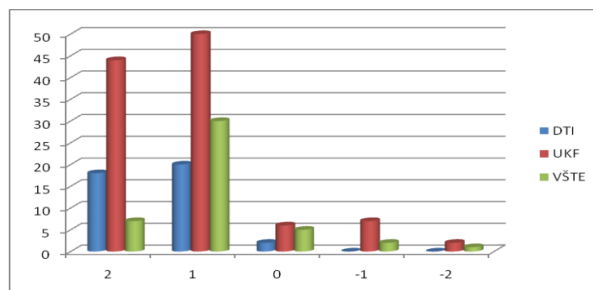
Table 1 The number of respondents at particular schools.

DTI	UKF	VŠTE	Σ
40	109	45	194

3.2 Evaluation of the use of didactic equipment on vocational subject lessons

The results of particular questions are illustrated in graphs 1 to 5.

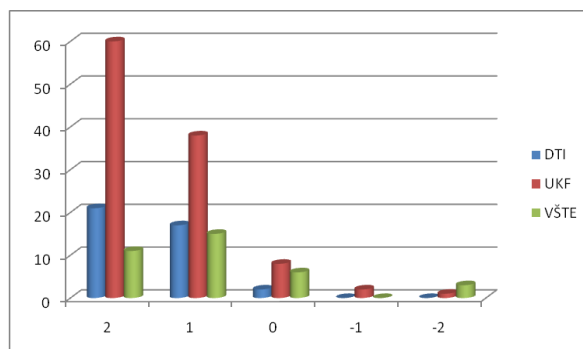
Question 1: *Is didactic equipment used on vocational subject lessons?*



Graph 1 Comparison of the use of didactic equipment at schools in the Czech Republic and the Slovak Republic

In the first question, students were asked, whether didactic equipment was used on lessons or not. 169 respondents indicated that didactic equipment is used on lessons at universities.

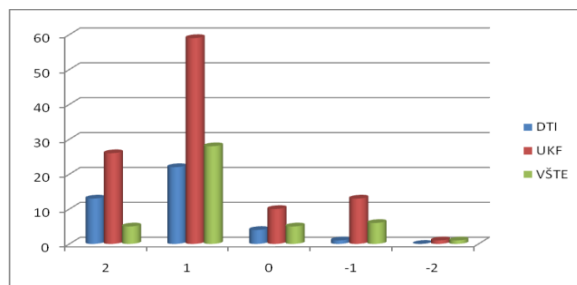
Question 2: *Are the lesson where didactic equipment is used more interesting for you?*



Graph 2 Attractiveness of the lessons at universities in the Czech Republic and the Slovak Republic

In the second question, the respondents were asked whether they found their lessons interesting. 162 informants agreed with the statement, that lessons, on which didactic equipment was used, were more interesting for them. The responses were similar, with differences only in the degree of agreement.

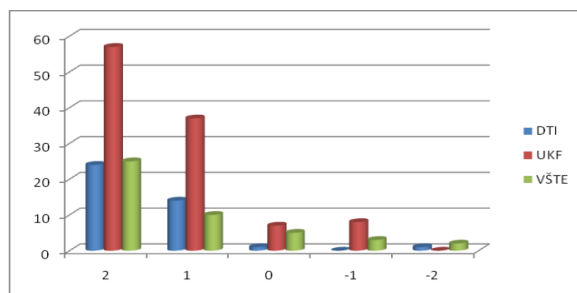
Question 3: *Are you always involved in the educational process when didactic equipment is used?*



Graph 3 Involvement in the educational process at universities in the Czech Republic and the Slovak Republic

In the third question, we investigated the students' involvement in the educational process when didactic equipment was used. 143 respondents indicated a positive answer; the obtained responses differed only in the degree of agreement.

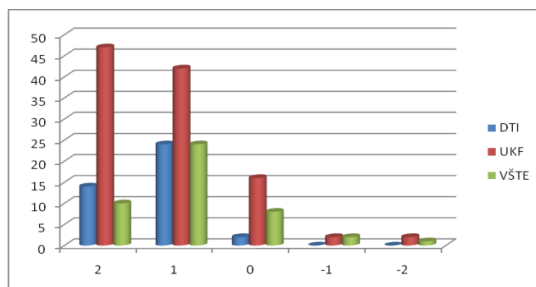
Question 4: *Does using didactic equipment make a lesson more efficient than only taking notes on the subject matter?*



Graph 4 Taking notes at universities in the Czech Republic and the Slovak Republic

The answers of the respondents in question 4 correspond with the answers obtained in question 2; the use of didactic equipment contributes to the quality of the subject matter explanation, helps its understanding, and is not used as a tool for taking notes. The answers differed only in the degree of agreement (+2 and +1).

Question 5: *Do you remember more from lessons when didactic equipment is used in comparison with classical lessons?*



Graph 5 Attractiveness of explanation at universities in the Czech Republic and the Slovak Republic

The results of question 5 correspond with the results of questions 2 and 4, as 161 respondents indicated that they can remember the subject matter better when didactic equipment is being used than on classical lessons.

Question 6: *Please specify which didactic equipment is used on vocational subject lessons.*

The obtained answers show that the teachers of vocational subjects use PCs, slide projectors, interactive whiteboards, special drawing programs, 3-D models, real machinery, and various tools.

4 Conclusion

The results of the research have shown that didactic equipment is used on vocational subject lessons at universities both in the Czech Republic and the Slovak Republic. The obtained results convinced us that the academic staff have perfected in the use of didactic equipment and that they are interested in educational quality improvement. In all questions, 143 or more respondents expressed a positive attitude; there were differences only in the degree of agreement.

Based on the research results, we recommend:

- ☐ to use didactic equipment and modern didactic technologies on vocational subject lessons;
- ☐ to continue research and investigate the effectiveness of education using didactic equipment and modern didactic technologies.

The use of modern didactic equipment and didactic technologies on vocational subject lessons can contribute to the quality of the subject matter presentation by academic staff, resulting in a better understanding of the subject matter by students.

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REVIEWS

Current Research in the Field of Disciplinary Didactics (Editors: Gabriella Pusztai, Zoltán Tóth and Ildikó Csépes)

*Publisher: Hungarian Educational Research Association, Budapest, 2012, 142 pp.
ISBN 978-963-08-5063-6*

Ján Gunčaga*

This special edition of the Hungarian Educational Research Journal presents several studies devoted to the didactics of different disciplines. The monograph consists of three main parts: 'Research in Science Education'; 'Research in Foreign Language Teaching and Learning'; and 'Research in Education of Humanities and Arts'.

The first part contains three studies: 'Development of "Water Circulation" in Class 2 and 4'; 'Investigation of Scientific Problem Solving Steps among Pupils in Primary Education'; and 'Using a Word Association Method to Study Students' Knowledge Structure Related to Energy Sources'. The first study presents the basic biology knowledge in primary education. The following study deals with the fundamental chemistry knowledge in primary education. Finally, the third study combines the biology and chemistry knowledge about energy sources for primary and secondary schools. These three studies provide a complex insight into biology and chemistry education at different types of schools and they present the statistical research by their authors based on the results of OECD studies and the concept map indicating the relations among concepts.

The second part comprises four studies: 'Assessing Young Learners' Writing Skills: a Pilot Study of Developing Diagnostic Tests in EFL'; 'Self- and Peer-Assessment in Focus: Stakeholders' Perceptions and Issues of Implementation'; and 'The Effectiveness of Grammar Teaching as Reflected in Learners' Language, The Fingerprint of Textbooks'. These studies provide the image of

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English teaching in Hungarian primary and secondary schools in relation to the textbooks used in the education process. Other aspects measure students' results, as compared to the Common European Framework of Reference for Languages: Learning, Teaching, Assessment (CEFR – to identify the level of knowledge A1, A2, B1, B2, C1, and C2).

The third part contains three studies: 'The Possibilities of Piano Pedagogy in the Development of Performing Skills and Abilities'; 'The Development of the Composition Skills from the Aspect of Operational Text Production'; and "Teachers as Learners – Concepts of Teacher Professional Development'. The first article presents the results of music education in primary art schools. This article shows the importance of improvisation and composition for children. The second study describes teaching Hungarian language as a mother tongue in Hungarian primary and secondary schools. The level of the ability of written expression from the operational aspect of text production by pupils is the main idea of this study. The last article draws inspiration from the OECD and TALIS studies for continuing professional development of teachers.

The reviewed monograph brings a multidisciplinary insight into different didactic approaches. Nowadays, many international programmes, such as the 7th Framework Programme, Comenius, etc., support interdisciplinary didactic research. Therefore, there is a need to create conditions for multidisciplinary discussions of scholars dealing with didactics of various disciplines. The monograph offers the opportunity to use different research approaches and it can help scholars in the field of didactics of different disciplines not only in Hungary, but also in other European countries.

**Profesní orientace adolescentů: poznatky z teorií a
výzkumů [Professional Orientation of Adolescents:
Findings from Theories and Research]
(Petr Hlad'o)**

Brno: Konvoj. 140 p. ISBN 978-80-7302-164-1.

Jana Krátká*

The purpose of the reviewed monograph *Professional Orientation of Adolescents* subtitled *Findings from Theories and Research* by Petr Hlad'o is to provide an overview of theories and research studies dealing with the professional orientation of adolescents and to present a description and results of a longitudinal empirical survey determining how students and their parents experience and deal with career choice at the end of lower secondary school.

Preparation for a career choice, deciding on it, and commencement of occupational training are a complex process and a traumatic situation for adolescents and their families, and a challenging professional problem for educating staff. Recent developments in the labour market also make the content of the monograph very topical, which, ultimately, the reviewed text also shows. The importance of this issue is not matched by a sufficient number of current or older available studies dealing with it in the Czech environment. The publication *The Professional Orientation of Adolescents* is therefore needful; moreover, it contains results of the work of an author who has been successfully dealing with the issues of career choice for a long time. The publication is therefore also useful for expert discussion and optimization of the methods of education for career choice in families and schools. The presented overview of theories and research studies of the course of career choice is focused mainly on students at the end of lower secondary education but it goes beyond to the circumstances of career choice by the students of secondary technical schools and grammar schools.

To achieve the objectives, the text is divided into nine chapters. *Chapter one*, Introduction, acquaints the reader with the issue of career choice, delimits the content, justifies the current importance of mastering the issue in question at the theoretical level as well as in education practice and parenting, and presents the most difficult moments in career decision-making. Moreover, it defines the scope of the readership of the monograph.

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Chapter two of the monograph formulates the meaning of the basic concepts of this issue, in particular the terms career, career development, career decision-making, career choice, choosing a further course of education, professional orientation, career counselling, career education, and career management skills. The content of the monograph is located in the space defined by the above terms. A thorough conceptual mastery of the issue is necessary here as the terminology of this field originated apparently very spontaneously and is not unified. Even after a thorough examination of this part, further reading is challenging as presented foreign theories and research studies depart from somewhat different terminology systems.

Chapters three and four are the theoretical base of the issue. They both are very well written. The author did not let himself get carried away to excessive briefness or unnecessary wordiness. The text allows to form practical ideas about individual theories (*chapter three*) or areas of the respective theory in question (*chapter four*) which enables to think in the presented categories and manners and to head towards the application of what has been found. Chapter three provides an overview of selected concepts of career theories. It presents structural and procedural approaches; together they form the basis for theoretical and empirical grasp of the issue of career choice. The approaches are ordered in a manner that they build on each other and the reader's understanding of the issue is being gradually refined and enriched by more aspects. Chapter four deals with the ontogenetic characteristics of adolescents significant for their preparedness for career choice. Obstacles and main risks of adolescents' career decision-making are dealt with. In both these parts the author minimizes his own "summarizing" conclusions or interpretations. This may be lacked by someone but by offering the presented issue in its "pure form", he allows the reader to draw these conclusions independently.

Chapter five turns more to educational practice; it describes the system of career counselling in schools, school counselling facilities, and also career counselling in the area of labour and social affairs. Activities of these institutions, which may influence the education for career choice and career decision-making, are described comprehensively, relying heavily on legislative connections and mapping of their activities carried out in the past. Reliance on governmental documents is also logical in *chapter six*, dealing mainly with an analysis of the representation of the issue of career education in the curriculum documents for primary and secondary schools.

Chapter seven of the monograph provides an overview of findings from Czech and foreign research studies covering the factors that influence career decision-making of students. These include mainly the influence of the social environment (family, peers, teachers, etc.), the degree of autonomy in decision-making, parents' strategies in their influence on the educational and professional aspirations of students, etc. It is again a strong, contributory, well written text, reflecting the author's erudition.

The author himself considers *chapter eight* the crucial part of the text. It presents the circumstances, course, results, and findings from his empirical survey. Anyone expecting a text that is better to skip and go to the results presented “at the back” is mistaken. It is an interesting reading and the findings the reader learns are substantiated and illustrated by the statements of the respondents. They map and describe the course, connections, and risks of pupils’ career choice process at the end of lower secondary school as well as the used decision-making strategies of pupils and parents. The reader will notice that the respondents of the survey are the “good” students and their families. From the point of view of the possible readers of the publication this is rather positive; extrapolation to other contexts is done in other parts of the text. The chapter deals with the research methodology and answers the questions on who in the family is considered an expert in career choice, how much parents should (in students’ view) interfere in the decision-making process, what strategies are applied by parents in students’ career choice, and what stages or phases of decision-making there are in students. Chapter eight also includes recommendations for the organization of the curriculum of the thematic area World of work according to the grades of primary and lower secondary schools. The organization uses the findings of the research survey. The end of the eighth part consists of findings on the influence of the course or manner of the admission procedure on the choice of the secondary school or occupation, and its perception by students.

Chapter nine, Conclusion, neatly summarizes, generalizes and relates the theoretical and empirical findings the monograph brings.

The author is a respected authority in the field presented. In my view, publications by employees of the former National Institute of Vocational Education (at present the National Institute of Education, School Counselling Centre and Centre for Further Education of Teachers) and the precise publication activities of the author of the reviewed monograph currently represent the top in the issue of professional orientation of adolescents in the Czech Republic. This is evidenced in the monograph by an extensive list of valuable bibliography, relevant for the area of professional orientation.

In the introduction, the author declared that the publication is aimed at teachers, counselling staff and parents. I consider it important in particular for teachers of the thematic area World of work at primary and lower secondary schools. They prepare students for the choice of their educational path and choice of occupation. Also secondary technical school teachers implementing the topic Man and the world of work and teachers of the educational area Man and the world of work at grammar schools can find a number of thoughts here. Furthermore, it is necessary to mention educational consultants, school psychologists, school officers, etc.; it turns out that persons involved in students’ career choice are many. The monograph can help them significantly. Should they have the need of broader understanding of the issues of professional

orientation, they may well use the website <http://www.vychova-vzdelavani.cz>, the author and administrator of which is the author of the monograph Petr Hlad'o.

The monograph *Professional Orientation of Adolescents: Findings from Theories and Research* addresses issues that have been little dealt with in the Czech Republic. The publication consists of a theoretical part as well as the author's own research and it relies heavily on international comparison of attitudes towards professional orientation of adolescents. It may therefore be recommended to those who deal with this issue at both theoretical and application levels. What is also positive is the fact that the publication is available online on Google Books.

INFORMATION

**International Scientific Conference and
International Workshop
Present Day Trends of Innovations 2013
24th - 25th May 2013
Podbanské – Grandhotel Permon**

*Ladislav Várkoly**

Following last year's conference in the Polish Łomża, this year's conference, thematically focused on information and communication technologies and their use in education, took place in the attractive setting of the Grandhotel Permon in Podbanské in the High Tatras. The scientific guarantor of the conference Ladislav Várkoly chose as the priority for this year the theme of mobile learning and the practical application of the so called distant experiments that can be used by physically handicapped people, too.

The international scientific conference "Present Day Trends of Innovations 2013" was organized under the auspices of Peter Plavčan – Director General; Directorate General of Higher Education; Ministry of Education, Science, Research and Sport of the Slovak Republic; Daniel Lajčin – Director General of Dupres Group in Dubnica nad Váhom, Gabriela Sláviková – Director of Dubnica Institute of Technology in Dubnica nad Váhom; and Erich Petlák – Dean of Dubnica Institute of Technology in Dubnica nad Váhom.

The main partners of the conference were: e-learnmedia s.r.o., Dupres Consulting, s.r.o. and Dupres s.r.o. in cooperation with

Kazimierz Pulaski University of Technology and Humanities in Radom (PL),
Instytut Technologii Eksploatacji – Państwowy Instytut Badawczy, Radom (PL),

Państwowa Wyższa Szkoła Informatyki i Przedsiębiorczości w Łomży (PL),

Politechnika Częstochowska (PL),

Białystok Technical University (PL),

Academy of Bussiness in Dąbrowa Górnicza (PL),

Silesian University of Technology, Śląska (PL),

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Business Economics Academy, Čačak (SRB),
Vysoká škola finanční a správní, Praha (CZ),
Mendelova univerzita, Brno (CZ),
Masarykova univerzita v Brně (CZ),
Evropský polytechnický institut, Kunovice (CZ),
Univerzita Tomáše Bati ve Zlíně (CZ),
Ostravská univerzita v Ostravě (CZ),
Univerzita Komenského v Bratislave,
Ekonomická univerzita v Bratislave,
Vysoká škola manažmentu v Trenčíne,
Technická univerzita vo Zvolene,
Trenčianska univerzita A. Dubčeka v Trenčíne,
Univerzita Mateja Bela v Banskej Bystrici,
Univerzita Konštantína Filozofa v Nitre,
Žilinská univerzita v Žiline.

The International Scientific Conference DTI 2013 was the fourth formal meeting and was an occasion for academic debate in the field of IT technologies and their use in educational environments. The audience consisted of teachers, scientists, young researchers, postgraduate students, and engineers from industry from Slovakia and its neighbouring countries.

In his opening address, Ladislav Várkonyi as the scientific guarantor of the conference, thanked dr inż. Szczebiot and dr hab. inż. Korneta, prof. PWSiP for the successful organizational management of the last year's conference at Państwowej Wyższej Szkoły Informatyki i Przedsiębiorczości w Łomży, for editing and providing the publication of the scientific work entitled "Present Day Trends of Innovations 2". Mr. Korneta proposed the attendees Erasmus scholarship between Dubnica Institute of Technology and universities in Poland.

Within the scope of the conference, there were the following themes:

- Modern e-learning technologies and information systems;
- Education management, knowledge management, self-learning organization;
- Electronic educational materials and modern interactive teaching aids;
- Modern teaching aids and interactive sensoric modules;
- Virtual laboratories and remote experiments;
- Operational reliability and safety of technologies and applications;
- Internet schools and online courses; and
- Automotive information technologies.

On the opening plenary session, the scientific guarantor outlined the creation process of a professionally oriented server since 1998, e.g. for the European Structural Integrity Society (= ESIS). He also mentioned the history of electronic scientific magazines such as Multimedia & Informatics, that were forced to

termination due to insufficient legislation of copyright and the refusal to recognize the papers published in them in the process of accreditation, etc.

Many speakers opened new themes concerning the above-mentioned problems and presented possible ways of their solution. The specialized presentations were very interesting for many guests that participated in the conference. Large numbers of them were accompanied by interactive demonstrations as well. Garmin company's promotional presentation is such an example, it was dealing with problems closely related to modern navigation systems and modern mobile e-learning applications. There was a possibility to test several features of their navigation systems for everyone who was interested in them, including setting and changing appropriate parameters based on their own requirements.

The lecture presented by B&M InterNets company representatives from Brno dealt with modern e-learning concepts and was considered very interesting, too.

A banquet on the first evening of the event has already become a tradition. It offers the opportunity to continue informal discussions related to the issues of the conference and to establish new international links.

During the evening, Gabriela Sláviková (Director of Dubnica Institute of Technology) christened a scientific publication on new EU educational and training centres, educational technologies and interactive learning materials for low-skilled workers and people employed in the building industry. It presents the results of the 3-year work of an international team of authors from Poland, Italy and Romania; Slovakia is represented by Ladislav Várkoly from Dubnica Institute of Technology in Dubnica nad Váhom.

The accompanying programme of the conference, the banquet and the international workshop provided more opportunities for networking and various informal discussions. Most discussions were focused on the possibilities of vocational co-operation among institutions, especially on university textbook creation, publishing scientific monographs and scientific papers in top-level research journals, sharing information and facilitating collaboration regarding progressive and innovative forms of education, and also dissemination of future collaborative international research in this field.

The discussions and negotiations related to the preparations of the fourth annual conference in 2014 started as well. The Conference is becoming more and more significant and has a growing reputation within the scientific and research community and people providing educational and training services.

This year's scientific outcomes of the international conference are even two reviewed scientific monographs of the conference papers in print that contribute to the established high-level prestige of the event. Submissions in English were published in the title "Present Day Trends of Innovations 3", submissions in other languages are collected in the publication entitled "Dnešné Trendy Inovácií".

Notice:

- 1) Continual collaboration in international scientific-research grants headed by Ladislav Várkoly and other new activities were successfully negotiated by the conference participants.
- 2) The vocational and media partners of the international scientific conference Present Day Trends of Innovations 2013 were: Garmin, B&M InterNets, spol. s r.o., Media/ST, Strojárstvo/Strojírenství, CITO Digital s.r.o., SOVA Digital a.s., Stavebníctvo a bývanie, PC REVUE, INFOWARE, SMARTTECH 3D scanners, Pastel – reklamné štúdio, T. Smaragd, KQUN Sk, s.r.o., Dubnické noviny, education.sk, konferencie.sk, edumenu.cz, and TV Považie.

Publication Ethics and Malpractice Statement

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Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behavior and are unacceptable. Review and professional publication articles should also be accurate and objective, and editorial opinion' works should be clearly identified as such.

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The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted. Plagiarism takes many forms, from passing off another's paper as the author's own paper, to copying or paraphrasing substantial parts of another's paper (without attribution), to claiming results from research conducted by others. Plagiarism in all its forms constitutes unethical publishing behavior and is unacceptable.

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Acknowledgement of sources

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Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

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The editor of a peer-reviewed journal *Acta Technologica Dubnicae* is responsible for deciding which of the articles submitted to the journal should be published. The validation of the work in question and its importance to researchers and readers must always drive such decisions. The editor may be guided by the policies of the journal's editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editor may confer with other editors or reviewers in making this decision.

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Submission of an article implies that the work described has not been published previously, that is not under consideration for publication elsewhere, that its publication is approved by all the authors, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language. A letter will be sent to the corresponding author confirming receipt of the manuscript.

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Corresponding author. Clearly indicate who is willing to handle correspondence at all stages of refereeing and publication.

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Subdivisions of the article. After the abstract, divide your article into clearly defined and numbered sections. Subsections should be numbered 1.1, 1.2, etc. Any subsection may be given a brief heading.

Appendices. If there is more than one appendix, they should be identified as A, B, etc. Tables and figures should be given separate numbering (Table 1, Figure 1), etc.

Acknowledgements. Place acknowledgements before the references.

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Acta Technologica Dubnicae
volume 3, 2013, issue 2

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The editorial policy and the technical content of the journal are the responsibility of the Editorial Board.

Authors are encouraged to submit their papers electronically to atd@dti.sk

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Periodicity: Two issues per year

Publisher: Dubnický technologický inštitút v Dubnici nad Váhom, Ul. Sládkovičova
533/20, 018 41 Dubnica nad Váhom, Slovakia

Place of Publication: Dubnica nad Váhom, Slovakia

IČO: 36342645

Date of Issue: December 6, 2013

Journal Website:

http://www.dupres-group.com/index.php?id=1&company=5&action=show_page&id_menu_item=218

<http://www.neoweb.sk/ATD.rar>

ISSN 1338-3965 (print)

ISSN 1339-4363 (online)

EV 4309/11