

CREATIVE POSSIBILITIES OF USING ICT FOR ECONOMIC EDUCATION IN TECHNICALLY ORIENTED STUDENTS

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Abstract

The current changes in access to education are perceived not only at the level of training, but also for the actions of the individual in relation to his own professional and personal development. When introducing innovations in the field of education the own personal settings and readiness to do something new is important. Not less important, however, there is a continuous interactive education of teachers. Many of them consider as the greatest obstacle to the introduction of innovations, the lack of methodological materials, information and funds for permanent personal training, as well as the lack of practical experience in preparing training programs. Technical processing of materials, tasks, and tests are for teachers at implementing of pedagogical innovations very time consuming. Similarly, exchange of experience in preparing individual modules, projects, tests, etc. is not coordinated and it happens only at mutual friendly contacts. The aim of this paper is analysis of the practical use of information and communication technologies (ICT) in education as well, assessment of the advantages and disadvantages associated with their use. Finding more opportunities and applications through innovation should contribute to the improvement of teaching and increase its efficiency and better knowledge.

Key words

Didactic; ICT; innovation; project teaching

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1 INTRODUCTION

In the majority of European countries the great emphasis is put on the usage of wide range of tools of information and communication technologies (further ICT). It is recommended in the educational process to use such virtual educational environment, which integrates the infrastructure of information and communication technologies and creates personalised on-line educational space. Different types of hardware, software, including computers, projectors as well as DVDs, videos, television, cameras or smart board have a significant, but not always positive, influence on education. Nowadays they have unambiguously exceeded use of computers and the internet. At present also other technologies are used in the educational process as digital cameras and mobile phones and others which integrate infrastructure of information and communication technologies and at the same time they support students' education and their personal development. There are not official recommendations or patterns, but majority of EU countries recommend or suggest in their published documents various official tools and counselling serving for schools and teachers to support information and communication technologies. Even if the use of ICT is for students and teachers commonly supported successful implementation of information and communication technologies in the education is not that much spread. Teachers recognise the importance and the value of information and communication technologies in education, but they also meet with misunderstanding of "theoreticians", so of people who are not familiar with conditions in practice, at the process of acceptance of these technologies. Very often it is also one of the reasons why they are implemented into the teaching just gradually and often with big problems. Innovations in educational process are perceived as something new, modern, interesting, more incentive, so as something which we implement into the educational process to increase its attractiveness for students and to help them reaching better studying results. Most frequently as innovative is considered the usage of ICT as a cross-sectional tool, activating, participative methods of work with students (e.g. project method), innovation of curriculum (teaching plans for new and newly implemented subjects), use of less common organisation forms (e.g. block teaching), implementing of elements of already checked innovative programmes (e.g. integrated thematic teaching) and so on.

2 THEORETICAL OUTCOMS AND ROLES OF ICT IN THE TEACHING PROCESS

The concept of information and communication technologies (ICT) is frequently used as a synonym of the concept of information technology. Generally the ICT concept emphasises the role of unified communication and integration of telecommunication tools, intelligent operative systems and audio-visual systems in the modern information technologies. It consists of all technical tools used for information gaining and easement of communication [1]. The data on primacy of the ICT concept vary and so it is with the definition of the concept itself. For example on one hand as ICT was understood modern computing technique, internet connection, exchange of information, processing of information, educational disks and so on and communication from local to worldwide level [2]. On the other hand, information technologies are considered as methods, procedures and ways of collection, storing, processing, verifying, assessment, selection, distribution and early delivery of necessary information in a required form and quality.

To the most frequently used ICT, when teaching the economic and other supportive subjects, there belong not only e-learning but also interactive tables, computers as tools for utilization of special educational software for marketing, financial analysis, accountancy and so on. Teaching portals are popular among students, they provide more complex processed areas: lectures,

solved and not solved examples with concrete results, with the possibility to train and at the same time independent control of correctness of elaborated solutions, entries and manuals for processing of case studies. All examples and tasks are not necessarily solved at seminars, or practising, but also in external surrounding, e.g. also in a park on a bank when they have the taste and time for it.

Formation of the individual using the processes belongs among the key features of the school, it is not important at which degree. In most cases, there is an effort to comply with the defined procedures and content and process of education [3]. When teaching, students' teachers should find the border between classical education and utilization of information technologies. Each implementation of ICT into teaching process carries besides advantages also risks. Quite easily a situation might arise when the tool changes to an object of the teaching [4]. In practice it means that instead of ICT utilization in teaching of economic subjects, students and also a teacher are devoted to study and education in the field of information technologies. Information and communication technologies used in the field of education are tools, aids which help and contribute to the increase of education effectiveness and to reinforce applications of necessary transition to combined form of teaching with the use of modern Information technologies and not the aim.

3 IMPLEMENTATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES INTO THE STRUCTURE OF EDUCATIONAL PROCESS

When implementing the information and communication technologies into educational process it is necessary to take into consideration two main educational approaches:

- *instructive* - instructive teaching methods might be quite easily supported via ICT, on the internet it is possible to find many instructive applications, which is possible to use directly in particular economic subjects,
- *constructive* - at present a large number of encyclopaedic knowledge is not enough, it is necessary for students to know how to generalize, associate, pay attention and understand mutual logical associations and relations between particular subjects.

If we want to grow up educated, creative, flexible and competent professionals, who want to study the whole life, continually we have to leave the principle of managed teaching and to replace it by the principle of constructivism. Its nature lies in understanding which the student (learning subject) creates himself, so that he considers new information, compares them with previous experience (knowledge and schemes), adopts them and reshape them so they "make sense" for him from the view of what he already knows. An important sign of constructivism reform of education is the change of the teacher's position from a provider of information to a guide who helps at their independent acquiring. Big emphasis is put on relations between subjects and preparation for team work. One of the ways how to apply principles of constructivism and at the same time to use ICT in the teaching of economic and additional technical subjects is to involve students to project creation via project education.

3.1 Project education

Interactive strategy of teaching and learning (further just INTe-L) is based on observing of phenomena in the real life with the use of real remote and virtual experiments, which together with e-learning material leads students to understand and manage basic economic relations. A dominant sign of project teaching lies in informal cooperation and creation of social positive relations [5]. The teacher puts big emphasis on cooperation and effective communication of students, learning one from another, exploring and probation of correctness of their suggestions and decisions. At project-based learning students learn mutual communication and contact with other people. In the frame of particular activities they realise themselves, also their relations to

others, they realise their existence and the rights of others. They learn to think, to reason, to accept compromises, to be tolerant. Through project-based learning we struggle to overcome drawbacks of traditional teaching, as isolation of knowledge and its separation from life practice, to eliminate memorizing, particular rationality, low students' motivation and so on. Project-based learning is composed of smaller projects and they are realised in the frame of particular subjects. Generally in the students' community there are popular multi-subject projects, but also one-semester and single-subject ones.

A particular project is designed to implement procedures within the teaching economic subjects in the individual terms and in relation to the courses (economics, business basics, marketing, accounting, financial management, creating a financial plan). In the frame of project elaboration, which creates in particular semesters only a part of seminar content they search for available information via the internet. Students in the project verify acquired theoretical knowledge gained by the study. For narrowly technically oriented pragmatic individuals, what in general students of technical faculties are, project-based learning is just very suitable and motivating. In the frame of particular levels they are divided into groups, so several projects will be realised. Realisation of the project-based learning will have the following course:

- at the beginning the theme of the project is defined, goals are determined and required outcomes are stated,
- in writing the precise plan and time table of the project solving is stated, partial tasks of the project, division into groups,
- at solving of the project the main activity will be on the side of students, a teacher will be in the position of a professional advisor, he/she only helps, advises, directs them at the activity.

In the frame of the project they:

- learn to work with various software (for accountancy, financial analysis, financial plan, human resources, controlling),
- they learn to search independently and utilise internet portals to gain relevant information related to the solved project,
- gradually they improve in presentation techniques and behaviour and so on.

After project solving each group presents results of their work (the most suitable is the presentation in Power Point) and they evaluate them and make comments. Project solving puts demands of work organization in a group, division of particular tasks, stating rules, determining of terms etc. When fulfilling of particular tasks of the project, motivation of students is supported, developed is also initiative, ability to communicate, to organise work, to realise own ideas, problem solving etc. At work they use their knowledge from several educational economic subjects. Project realisation is demanding for teacher's preparation and abilities, during project solving a teacher has to organize the work properly and follow students' activity, to direct them and to advise them. Project elaboration also requires material equipment (ICT). At project solving students elaborate following parts of the project: company foundation, creating of entrepreneurial plan, company description, product or provided service description, elaboration of technical-organizational plan, market analysis, solution of company strategy, human resources, creation of basic accountancy provisions, "revive" company, bill created accountancy operations, prepare tax return and elaborate financial plan for further years.

Even though the project is demanding for elaboration, for students it is enough creative and through it many of them find not only the sense of implementation of economic subjects into curriculum at a technical university, but their importance in practice of each of them. Many of

them find courage and implement their projects into life. Our experience shows that particular parts of INTe-L are possible to be implemented in project-based learning and their suitable utilization in projects gives it another dimension, because:

- acting of a student is complex: it begins from the processes of observation, it further continues in experimenting (real, virtual), processing and evaluation of results, which finally leads to confrontation with theory and so its verification,
- expanding the number of information sources, their variety, form of their elaboration and ways of results' presentation.

3.2 Use of interactive table systems

A classic school blackboard, where a teacher stands every day with chalk in his hand, was frequently the only equipment in the class. In the frame of increase of school attractiveness and its equipment, as well as of innovation of educational process it is done via further new electro technical tools. Utilisation of interactive table systems in the educational process requires not only to have these tools, but also to have a qualified teacher. Only then it is possible to implement and develop other actual trends in multi-media education, e.g. utilisation of multimedia for motivation purposes. An interactive table belongs in our country to the most modern didactic tools via which the process of students' motivation increases the level of public relations of a particular state or private educational institution. The interactive table contributes to more effective utilization of student and teacher's time management. Through presentations with thorough use of ICT the quality of educational process increases [6]. It is electronic equipment which allows directly from the table to work interactively with PC or notebook by clicking on projected picture via an interactive pen. Using the table it is possible to control learning programmes, office applications, but also practical demonstrations from practice, tools and learning materials to particular subjects. Particular learning texts the teacher may prepare himself in external graphical or text environment. Everything is done directly from the table. There is also possibility to open files and folders directly in the computer, or on external media through main menu of the interactive table. While having lecture it is possible to write and insert notes into projected picture, highlight fundamental things or make descriptions, retrospectively return to previous documents and many other activities. When using the interactive table students become direct participants of a lecture, instead of passive listeners, which is reality of many teaching hours. This way provides the possibility to control given tasks, or check students' knowledge, which is less stressful and provides much more pleasant form. From each activity it is possible to create written record quickly by a simple printing of the screen, if the printer is connected to the computer, or by scanning and sending processed task results into their own computers. The teacher in the frame of education has the possibility to involve a student directly to the process of creation e.g. case studies of the lectures, or directly to the lecture.

As each progressive system, also interactive table might any time at application in the teaching process somehow negatively surprise us, so it is necessary:

- to pay attention to correct connection to the computer and video projector, to correct and safe connection of the computer and video projector to electricity,
- to install software and calibration of the whole system correctly,
- to tune the system again, because after certain time of use the system reaction is inaccurate or delayed, in this case,

- to create majority of teaching materials in the external environment in the computer software, because this system does not have perfect environment and then at presentation simply to play them as recall.

As already mentioned, technology, despite all caution and preparation, can betray us, it is necessary to think about such possibility in advance and have an alternative teaching lesson.

4 TEACHER AS FACILITATOR OF KNOWLEDGE TRANSFER

Implementing of new, innovative elements and methods to the process of education is necessary, but also today the biggest value which the school provides is the quality of the teacher. In teaching process he/she is motivational power which gives the direction, strength and also acceleration. In the teaching process he/she takes the role of an evaluator, manager, facilitator, captain and also partner [7]. Even the role of ICT is important and without it is impossible to go further, it is not necessary to use and implement information technologies, as well as their subsequent application, to overestimate it in the teaching process instead of solving of pedagogical problems. Teaching is an active process, which is done on the basis of associations, when a teacher acts in this process as facilitator of the transfer of mutually related knowledge. Therefore, a student better remembers facts and events relating to the previous acquired knowledge, or emotionally and personally lived experiences. New facts and information have the chance to bind, they create firm and frequently permanently gained knowledge. In the brain the programmed scheme changes, new synapses are created, which are empowered by new impulses and new knowledge fixation. A big challenge for teachers is creation of such pedagogical environment which allows creation of still new synapses. It expects his/her professional, pedagogical, psychological, didactic competence and high personal and also human profile.

5 CONCLUSION

Effective are those school which create the biggest added value, i.e. increase difference between that what knowledge students had at admission to school and what they have after its finishing. The content of added value creates the system of requirements which the educational institution has to cover and fulfil. Effectiveness is related to a school, but mainly to the process which runs in it. From attributes which determine it, the most important is motivation, teaching trends, modern methods and an activating teacher. The human brain is adopted for life-long learning. It is more effective and longer, if words and facts are related to pictures, if learning runs in joyful environment, rich for impulses, if at learning and fixing of knowledge percipient is confronted with pleasant feeling and good mood.

This status can be induced by the choice and application of suitable methods and didactic processes. Through them we have to monitor the element of effectiveness, which belongs to the area of economic education. It is the relation of invested effort to achieved results while as effort we understand own time, energy, material bases, finance and further aspects of own individuality. Absolute effect probably never comes, but the highest relative one is expected.

Assuming that the sum available, time and material resources are limited and therefore finite, it is necessary to supervise the ways of their rational use.

Certainly this process is supported by mentioned information and communication tools. Important, however, is primarily the extent of their implementation into teaching process. In practice we often meet with tendencies to maximize their effect and overestimate their share in the frame of education. Forced exercising of theoretical application not necessarily leads to reaching of higher level of knowledge, of higher quality of education. The teacher further has a relevant role in coordination of work in the interactive relation with a student.

Nowadays the way of education is obsolete and needs to overcome the differences between that how the nowadays young man lives and how he is educated. Only upgrade of technical equipment is not enough, there is a need to upgrade the content knowledge needed.

This is related to the mission and innovation status of teachers in society itself, without their professional development and continuing education, the success probably will not come.

If we want to teach students correctly and reach required results we have to understand first their way of thinking. At the same time it is necessary to fully understand taught concepts and problems; subsequently they might be perfectly and effectively mediated to students. The core is in the constant innovation of teacher's thinking and approach to students as individuals.

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REFERENCES

- [1] Scheffler, F.L., Logan, J. P. (1999). Computer technology in schools: What teachers should be able to do. *Journal of Research on Computing in Education*.
- [2] Weert, T. van, Anderson, J. (2002). *Information and Communication Technologies in Education*. A curriculum for schools and Programme of teacher Development. Paris, UNESCO.
- [3] Průcha, J. (2002). *Moderní pedagogika*. Praha: Portál 2002. 488 s. ISBN 80-7178-631-4.
- [4] Maňák, J., Janík, T., Švec, V. (2008). *Kurikulum v současné škole*. Brno, Paido. 128 s. ISBN 978-80-7315-175-1.
- [5] Ožvoldová, M., Gerhátová, Ž. (2010). *Projektové vyučovanie s využitím integrovaného e-learningu*. Bratislava, TYPI Universitatis Tyrnaviensis. 51s. ISBN 978-80-8082-386-3
- [6] *Moderná didaktická technika v práci učiteľa*. (2010). Košice, UIPŠ v súčinnosti s elfa, s. r. o. ISBN 978-80-8086-135-3.
- [7] *Premena školy s využitím informačných a komunikačných technológií*. Využitie IKT v danom predmete: spoločná časť (2010). Košice, UIPŠ v súčinnosti s elfa, s. r. o. 163 s. ISBN 978-80-8086-143-8.