New teaching and learning methods through virtual environment

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Abstract — *This paper focuses on effective approach to teaching an learning, regarding dramatic development information and communication technologies. There are shown techniques, which are effective in the networked environment, e.g. like e-learning, collaborative learning, and possibilities deployment of information technologies for integrating face-to-face and on-line learning. Modern information technologies are going to enhance development of new methods of searching, acquiring, organizing, processing, sharing and using of information from various sources and disseminate it to users, namely by using VLE and LMS. The applications enable automatic access to informations anytime and anywhere. By modern ICT it is able informations and knowledges share and effective use. In past time universities being asked especially to create and disseminate knowledges, now shifts demand on university education to new wave in tutorial, to ability work in team (e.g . at projected teaching), cope with changes, be flexible and innovate.*

Index Terms — *education process, role of teacher, e-learning, blended learning, collaborative learning, ICT (information and communication technologies), LMS (Learning management systems), VLE (virtual environment)*

Introduction

In Czech school system in most basic and grammar schools is still typical the kind of teaching in classroom, that the teacher tells and learners or students listen, then students speake together and create new informations, and the teacher evaluates. In universities that situation is much more better, but also in classroom dominated by lecturer the knowledge is declarative, decontextualised, and inert. Knowledge is not personally constructed nor applied. In contrast, in collaborative classroom is information and knowledge shared. Collaborative teacher also value and build up on the knowledge, personal experiences, language, strategies, and culture, that students bring to the educational process. Progressive teaching is seen, when model of teaching strategies and knowledge making in the context of task completion, and then students attempt to do the task the way, the teacher did it, eventually students do the task on their own. Collaborative learning (and in my opinion it need not to be only online) and project learning involve students in team, that meet several criteria, including positive interdependence and individual accountability for every part of the project. Through modern ICT (information and communication technologies) the informations and knowledge are shared and effective used. With growing information literacy of students anything that is learned can be actively taught. It means the ability to know, when information is needed, and to be able to identify, locate, and effectively use that information for lifelong learning and problem solving. The focus in new concepts in European education system is changing from learning to do (or know) towards learning to learn.

Impact of ICT in educational process

Rapid changes in ICT involve also changes in educational process. One of the questions being asked by many teachers is: What will be the long term impact of the introduction of these technologies into the classroom? Another question being raised is: What kind of skills will teachers need to acquire in order to be effective in an ICT based learning environment ? Important will be the long term impact of ICT on the teaching and learning process.[1]

Nowadays modern information technologies are going to enhance development of new methods of searching, acquiring, organizing, processing, sharing and using of information from various sources and disseminate it to users. The applications enable automatic access to informations anytime and anywhere. By modern ICT it is able informations and knowledges share and effective use. Not only in higher education seems more necessity to increase of information literacy. It means the ability to know when information is needed, and to be able to identify, locate, and effectively use that information for lifelong learning and problem solving.

ICT impact on both learners and teachers. The concept of shared resources, and shared working spaces, and particularly the notion of collaborative learning may be particularly difficult for some teachers to accept. Most critically, the question of the extent to which teachers relinquish control and let learners drive their own learning may create the greatest barrier to the adoption of ICT in the classroom.

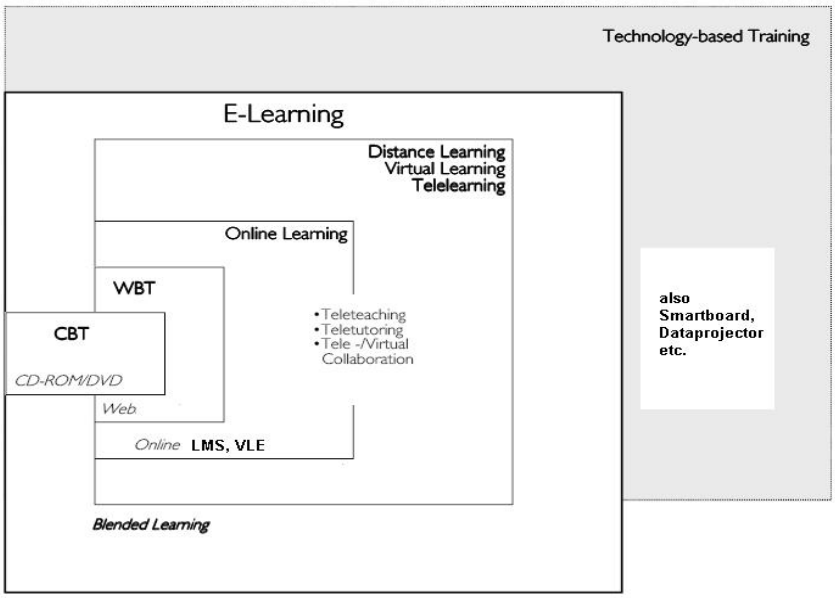

FIGURE 1
TECHNOLOGY-BASED TRAINING

Shared learning resources. One of the most striking examples of ICT in action in schools is the apposite use of video systems to transmit television programmes and information throughout an entire school and even between schools in the same district. This integrated approach to the regional sharing of learning resources is enabling elementary and senior schools to minimise expenditure by concentrating time and effort into creating centralised services. Students and teachers enjoy the facility to share information wherever they are in the school.

Shared learning spaces. Networked computing facilities create a distributed environment where learners can share work spaces, communicate with each other and their teachers in text form, and access a wide variety of resources from internal and external databases via web based systems through the Internet. Networked software can be used by students to communicate with each other and their teacher (in our case it is WebCT environment, where we create courses). Using these shared systems, students develop transferable skills such as literary construction, computing techniques and written communication skills, whilst simultaneously acquiring knowledge of other cultures, languages and traditions. Furthermore, students are able to make links between internal thinking and external social interaction via the keyboard, to improve their social and intellectual developments in the best constructivist tradition. Students are quickly mastering the ability to communicate effectively using new technologies and their own experiences.

In **e-learning** tutorials are a way, where teachers supplement on-line learning with a face-to-face component. Typically, a teacher will organise a time where students can come and see him or her, or arrange for students to work in a learning centre with assistance from a tutor.

Collaborative learning

Communication networks and information services on Internet make possibility searching and sorting information, communication among people of different countries, provides possibility to discuss, make videoconferencing, create virtual teams. Network architecture can serves as model efficient knowledge generating pattern. In this direction university can to be "learning organization". Nowadays is often used teaching method based on cooperation ("collaborative learning"). The collaborative tradition takes a more qualitative approach, analyzing student talk in response to a piece of literature or a

primary source in history. Cooperative learning is defined by a set of processes which help people interact together in order to accomplish a specific goal or develop an end product which is usually content specific. It is more directive than a collaborative system of governance and closely controlled by the teacher. While there are many mechanisms for group analysis and introspection the fundamental approach is teacher centered whereas collaborative learning is more student centered.[4]

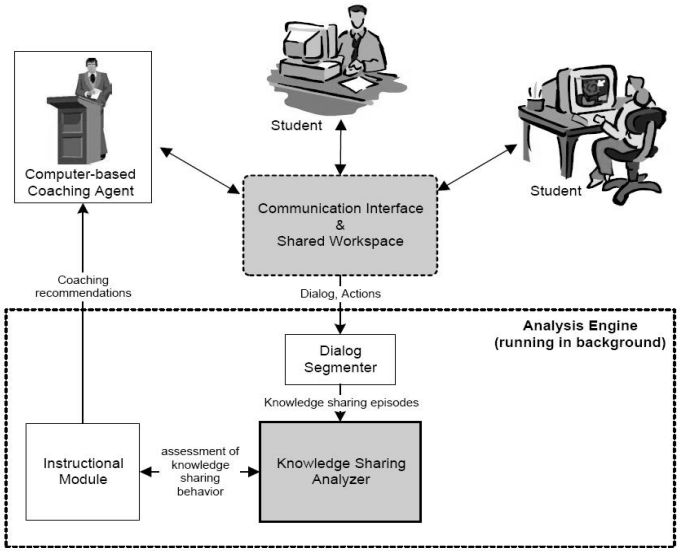

FIGURE 2
SHARING KNOWLEDGE BY COLLABORATIVE LEARNING

Role of teacher

Most clear change in education process is new role of the teacher, namely from transmission knowledge to thoughtful teaching, to knowledge, how students learn and why. Changes in teaching process demand adaptation on new reality, flexibility and high degree of innovation, alike it is in entrepreneurial environment. Regarding to vehement development information and communication technology appear new chances in distance education and especially in e-learning. Through effective use ICT in tutorial it is possible achieve high quality of team work at cooperative and collaborative learning, use process approaches in project learning, or use brainstorming in group learning. Idea „teacher in centre of interests" shifts to the idea „student in centre of interests". Role of teacher in this process is only motivating and inspirational. To prepare lectures now demands knowledges about different disciplines, combination with skills and practical know-how. Broad flexibility of knowledge, grant student, is often produced by new way of class organization and open using distance education.

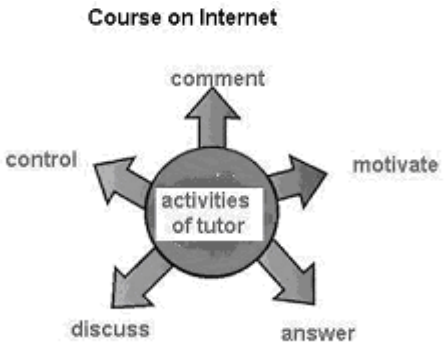

FIGURE3
ACTIVITIES OF TUTOR

Internet in education

We are investing in information and communication technologies to improve and update the education they provide younger generations. Also improvement in education and training contributes to competitiveness, employability and mobility in modern economies. Global economic pressures are inexorable determinants of educational policy, and argues, that any country will need to develop its own national approach to modernising education in light of the global context and its particular conditions.

For universities it involves new standpoints in policy and research, qualitative assessment of skills and their relation to company demands, partnerships, encouraging higher achievements in education, and creation of high quality opportunities, outsourcing, and integration. Especially for faculties of education, it entail the need for improving the professional skills and knowledge of teachers. It concludes by arguing that the reflexive modernisation of teacher education would involve the development of new concepts of learning, a rethink of the teacher education curriculum, the development of new forms of partnership between schools and universities, and a reconsideration of how the professional skills and knowledge of teachers are assessed and by whom.

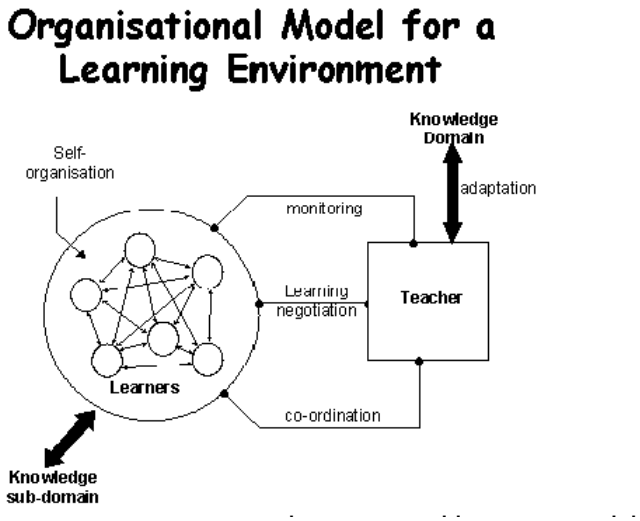

FIGURE4
LEARNING MODEL

A difference between teaching and learning

Many studies shows changes in teachers' knowledge and beliefs about teaching and learning, and the changes in their teaching practice that accompany the use of the new information and communication technologies as an integral part of their instruction in the classroom. The changes describe a radically different classroom situation from the traditional one for both teachers and students, one in which participants' roles (i.e., who is instructing) vary from time to time and from person to person, in which participants' responsibilities and expectations are much more elaborated and varied, and in which knowledge and expertise is shared across teachers and students. In particular, teachers' activities in fostering student learning emerge are very different in pattern, although not in kind, from those seen in the traditional classroom.

By term “learning” it means active learning. **Active learning** is classroom instruction that involves students in activities other than watching and listening to a lecturer. Working individually or in groups, the students may be called upon to answer questions, solve problems, discuss, debate, reflect, brainstorm, or formulate questions. **Cooperative and collaborative learning** is instruction that involves students in team projects under conditions that meet several criteria, including positive interdependence (the team members must rely on one another to carry out their responsibilities) and individual accountability for every part of the project. Both cognitive science and empirical classroom research have repeatedly demonstrated that

when properly implemented, **these techniques motivate students to learn**, increase the extent and quality of their learning, lower attrition from academic programs, and improve attitudes of students toward their education. Students "learn to learn" problem-solving, communication, teamwork, selfassessment, change management and lifelong learning skills.

System thinking

System thinking together with system dynamism offers in education common frame for preservation cohesion, sense and motivation on all levels of education, at first. Second element is emphasis on active student cognition, which imbeds into tutorial new challenges and interests for learning, how it is common in experimental laboratories. These two innovation, gathered together, help to enhance creativity, inquisitiveness and life energy of young people. There is necessary to systematically learn and use system thinking like common tool for everyday activities. Strong attribut of system thinking is there a connection philosophy, policy and culture with everyday work. Common ideas there are connected with actual datas from particular areas of society, policy and economy.

Increase information and computer literacy

In Faculty of Education in University of Hradec Kralove is given high attention to training of information and communication technologies. All students should complete examination of compulsory subject Information and communication technologies 1. Most of them continue in studying of subject Information and communication technologies 2, which is included in group of obligatory allowed subjects (http://oliva.uhk.cz/). Both of this subject are based on European Computer Driwing Licence concept, which is there enlarged on base of typography, right citation of used information resources, practical computing and graph drawing in spreadsheed processor and on presentations creation for support of learning. With support by Ministry of Education foundation (FRVS) were created multimedial materials, which highly contributed to increasing learning effectivity. There are used videosequences, whereby are demonstrated concrete operations on computer by processing assignments.

Methodology of educational course creation

Similarly like in information systems projection there is able to use the same procedures and methods. Project includes following basis parts – **preparation, realisation and evaluation**, where preparation phase have in educational scope this **life cycle:** definition of goals, SWOT analysis, global concept of course, detail concept and design, implementation to learning environment and customisation for students needs.

Basic structure is shown on following picture:

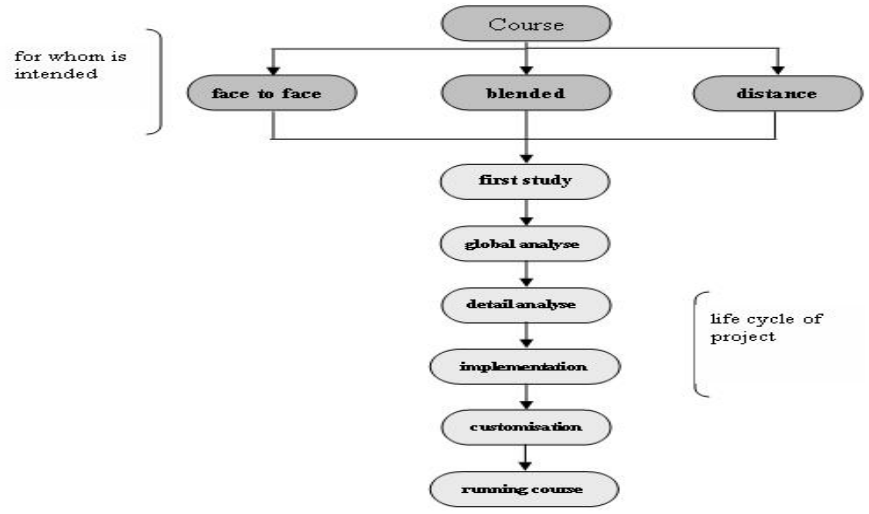

FIGURE 5
STRUCTURE OF COURSES

Supporting **group learning** requires an understanding of the collaborative learning process, which is shaped by not only the individual's ability, learning style, and motivation, but also the group members' individual behaviors, and the dynamics of their interaction. Although many studies mostly illustrate group interaction online, there are also developed computational methods for supporting student interaction in the classroom. Providing a supportive environment means accounting for the spectrum of activities that groups engage in while learning. These activities include the exchange and negotiation of knowledge, possibly leading to conflict and cognitive change, the construction of new knowledge, and the development of social skills.

Recommendations in term of didactic approaches in education

There is necessary to choose suitable approach for adjusting content of education to students needs and skills. We focuse especially on methodology and orderliness in education material and educational software to enhance active learning:

- **Meaningfullness and usability for practice**
- **Interdisciplinarity of subjects**
- **Finding and discover several methods for solving problems**
- **Development of abstract thinking**
  - from concrete to abstract, from special to common
- **Characterisation of concepts, organising to systems, classification**
- **Creating hypothesis and their validation**
- **Active learning**
  - increase inner motivation
- **Critical thinking, autoevaluation**
- **Communication and dialog supporting**
- **Creativity**
  - creating own opinions and solutions

Conclusion

In higher education express new access to teaching process, regarding dramatic development information and communication technologies and possibilities its deployment for **integrating face-to-face and on-line learning**. In education are applied principles of „learning organisation", and system approaches.[6]

With rapidly changes in information and communication technologies and growth of ICT-related activities in all sectors led to shortages of highly-qualified ICT professionals. For universities it involves new standpoints in policy and research, qualitative assessment of skills and their relation to company demands, partnerships, encouraging higher achievements in education, and creation of high quality opportunities, outsourcing, and integration. The 21st century will exhibit also rapid changes in societies. In a consequence, today's students should be prepared for unexpected change. Education should provide a foundation that gives a student mobility to shift with changing demands and opportunities. We should give students a more effective way of interpreting the world around them.

In our university we are embarked in high-powered work on preparations choice subjects for combination forms studies in virtual educational environment WebCT, and for full-time forms of studies like supported materials. We also make up videoconference, but in my opinion not very suitable for education.

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