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EXPERIENCES WITH NEW APPROACH TO USE OF INFORMATION TECHNOLOGIES IN EDUCATION

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Abstract: Paper describes approach of Department of Information and Communication technologies (KIK) on Pedagogical Faculty of University of Ostrava in Ostrava (PedF OU) to development of information knowledge and skills of students of OU with the aid of modern methods and education technologies with support of information technologies (IT). It surveys the application and development of these methods in the course of approximately last seven years.

Zusammenfassung: Paper beschreibt den Ansatz der Abteilung für Informations-und Kommunikationstechnologien (KIK) an der Pädagogischen Fakultät der Universität Ostrava in Ostrava (PedF OU) für die Entwicklung der Informations-Kenntnisse und Fähigkeiten der Studenten der OU mit Hilfe von modernen Methoden und Bildungstechnologien mit Unterstützung von Informationstechnologien (IT). Es untersucht die Anwendung und Entwicklung dieser Methoden im Laufe der letzten ca. sieben Jahre.

Key words: ELearning, distance learning, study supports, Learning Management System (LMS)

1. Introduction

We live in society in which information and communication technologies (ICT) become movers of its development. In the area of education this development influences significance and structure of education process and competences of school graduates. The aim of connecting ICT into education process and learning is not mere managing the basis of the work with computer, but the change of learning process, increase of attractiveness and efficiency of this way of education.

Education and special training during the whole life is the best way of coping with changes, which the modern times bring. Student of the full-time study form are being prepared for this reality. Also for people already in working process who are pulled in the necessity of lifelong learning by everyday practice this reality becomes “known and necessary”. Skill to work with changes is understood as complex competence and means to note the given change, understand it and be able to react to it adequately. Students´ efficiency of work depends on their information skills. Transformation into knowledge and skills proceeds mostly in the frame of the lifelong learning.

Technologies based on use of Internet services gain privileged position in the information technologies area. That is why next to the term information society we often find the term Internet society. As a new information and communication medium Internet should find its way to schools and be taken as very perspective device.

We are fully aware of this fact and that is why we try to introduce computer technology to students right after their entrance to study on Department of Information and Communication Technologies. Their knowledge and skills in the ICT area are gradually improved during the course of their study, they expand and are given concrete form.

2. Department KIK orientation

Information and communication technologies have significant influence on development of teaching methods and ways of education. It is possible to use them within constructive approach to teaching and in project orientated teaching. Constructive are all teaching applications, which support own activity of students, that is editors, authorial systems, programming languages, tools for modelling. The project teaching serves here for reaching creative skills of pupils. It is about carrying out some

practical tasks, there are many of them, and everyone chooses the one, which is the most suitable for him/her. Practically it is done by project solving (individually or in team).

Technologies contribution generally consists in the effort to speed up and potentate education processes, make distribution and concentration of teaching materials easier. The way of technologies use depends mostly on knowledge, skills and teachers´ approaches to their use.

KIK Department focuses on teaching of subjects, which should teach students not only user approach to information technologies but also introduce them use of information and education technologies in education and teaching.

Sphere of department impact in these areas is divided into four parts.

a. Department organizes for all OU students entering the 1st term of study so called Course of computer literacy. This one-day course is realized before the beginning of the first term. The aim of the course is firstly test by pre-test entrance knowledge of accepted students and after that practically introduce information systems to students, with which they will meet during their study. In the case of failure in the first testing the full-time study teaching carries on and the knowledge of students is completed. Self study and solving of given tasks is prepared for the next part of the course.
b. KIK guarantees study subject Information technologies in education. This subject is offered in the full-time study and distance forms in all three stages – bachelor, following master and doctoral. Graduates of **bachelor study subject field** are able to organize, conduct and control, possibly cooperate in designing and equipping school with ICT and perform role of "manager" of school information system. In **following master study subject field** students are prepared for the work of coordinators or managers of distance education courses. Graduates can be even responsible for education of human resources in some companies and firms. **Doctoral study subject field** prepares specialists with knowledge and skills in projecting modern information system area, in theoretical basis of informatics and in creation of education materials for eLearning.
c. Other Department contribution to information competences of students of OU increase is joining KIK to modular study starting in University of Ostrava. Module is compact complex of subjects, which are related to each other in content. Subjects are composed in such way so that by their completing student will gain basic knowledge and skills in areas, which will help him/her to find place in labour market. Module will enable students to gain further competences – knowledge, skills – beyond the frame of study subject. The aim of starting these modules is mostly to improve use of graduates in labour market. Department guarantees module Preparation for ECDL testing, Basis of programming and Creation of multimedia applications. Modules are designed for all students of University of Ostrava.
d. Department secures Coordinator of information and communication technologies course in the frame of lifelong learning. This course belongs to the category of further education of pedagogical workers.

I will demonstrate chronological summary of used ICT means on the area of Information technology in education, which is guaranteed by the Department. Other areas are similarly enriched and modernized by introducing ICT into education.

3. Innovation in education with ICT support

New modern trend in area of education is so called distance learning. In the Czech Republic it is understood as "learning at a distance". It is defined as multimedia form of managed self-study, in which teachers and student are physically separated in the course of education process. It is highly individualized education. Multimediality here means use of all distance communication devices, by which it is possible to present curriculum – that is printed materials, recordings, computer programmes on diskettes or CDs, phones, faxes, E-mails, radio and TV broadcasts, Internet. In spite of mentioned multimediality of DiV system the basic study material is still printed. It, however, radically differs from the texts used in full-time study form, where student works under the tutor's leadership.

In case of distance form students obtain learning materials, they study individually and communicate with tutor in prearranged way. This form of study is very demanding on quality of study material. During distance form of education student must find in study text all instructions and goals of education, practical tasks, motivating tasks and tests. Among advantages belong certainly the fact, that students do not have to visit the school building in given times, but can study when is suits them, at the place where they live. Even though distance form of study has several advantages, it cannot entirely replace classical full-time study form of education. Distance form is not suitable for every kind of student. Attendees of distance course must be motivated enough to go through the difficulties and inconveniences, which are waiting for them during the study.

Practice gradually shows that the most suitable aim group are adult students, who are employed and want to complete, expand and update their existing education and knowledge. This group of students are aware enough their co-responsibility for their education.

Distance study requires new approach to creating of study texts, study tools and materials, which are generally called study supports. Study texts are composed in such way so they make the self-study easy as much as possible. That means that they are uniformly measured out, after each part there are located feedback elements, which test understanding of curriculum. The text itself is richly divided, it includes problematic tasks, sample solved exercises and questions, to which the students will find answers during the course. For the answers there is always enough free space in printed text (empty columns at the edges of every page). Every chapter includes goal definition (at the beginning of chapter) and summary (at the end of chapter). Useful element of distance texts is written essays, so called correspondence tasks.

In such way created and put together texts differ from study materials point of view, from commonly used materials in full-time study form of education. However, the curriculum is arranged linearly there, that is the students go through the text from the beginning to the end. Entrance knowledge and skills of student is not respected and distinguished here. Students who are better in knowledge and skills must go through known information and solve tasks, which are useless from their point of view.

This imperfection is removed by so called *tutorial hypertext*. Information put forward to students is multimedialy processed (it contains different animations, music, sound, …) with possibility of interaction and correct understanding of the curriculum is continuously tested.

Concretely this trend of teaching – distance form – was tested on combined students of subject Information technologies in education. Gradually it is introduced into subjects of other fields. For individual subjects were prepared special study materials by team of trained specialists. They were given to students in printed as well as electronic form. One of the opening steps during planning and organizing study was to set basic characteristics, form and structure of study texts. Content and form of each study material is understandably conditional for which subject, what education area is intended. Mathematical text is differently divided; philosophical text is divided in different way, as well as economical or juridical texts.

The basic outline of every study text used in the frame of teaching in this field has unified structure. Structure should be well arranged so the students would be able to orientate themselves in the text without problems after reading first chapter. By that we mean that they will find on the same place (in the same order) paragraphs, parts of chapters with similar tasks (questions, definitions, examples).

4. E-learning

E-learning is closely related with distance education. It is the way of education using multimedia computer courses and modern way of their distribution. Its lowest stage is common education programmes. The difference between them is that eLearning courses mainly cover large part of curriculum. They are not about practising one particular skill, but they are about the whole teaching – from motivation, explanation, practising to repetition and testing of gained knowledge.

Teacher, who has at his/her disposal complete course and computer classroom, can create effective and interesting lesson for students. He/she helps each student individually and motivates him or her.

The main stream of teaching is given by course itself, role of the teacher is in communication, evaluation and assistance.

Also database tools are used for leading and evaluation of education. Computer devices enable simulation of complicated facts; they can also deepen and improve quality of motivation and feedback of students. It is possible to use Internet for education in the following basic ways:

- Internet as education mean of common form of teaching
- Internet as source of textbook information for distance learning
- Internet as education environment for conducted learning.

E-Learning form uses the second and the third way of Internet use, but its application differs in both cases.

Internet as a source of textbook information

Many elements known in common full-time study fade away from learning – no formal communication between tutor and students, among students, conducted teaching by experienced tutor is missing. Use of Internet is reduced only to creation of basic environment for gaining textbook information and basic communication. Tutors place study material possibly other tasks and requests on web pages. They communicate with students with the help of electronic post. The learning is mostly not conducted and coordinated and changes into clear student's self study.

Internet as education environment for conducted learning

This type of education environment is secured by system of conducting learning – Learning Management System (LMS). During the whole time when we are engaged in eLearning on Department, totally five operation systems took turns on University. Most of them we used for mere "release of electronic study materials". Since 2006 we have started to use system LMS Moodle on Department and we start to create E-courses with all their attributes and parts.

If we view eLearning as one of technologies for education, it is logical that we must have considered its introduction into practise. It is appropriate to state its methodology and organization in introducing eLearning technologies into practical teaching.

Practice with creation of courses on Department was checked by further formulated sequence of course development, from simple text to multimedia form of education unit:

1. Creation of electronic form of learning text
2. Transformation of learning text into form of printed distance learning text (providing "ordinary explanation" with elements according to methodology for distance study supports)
3. Division of learning texts into parts suitable for LMS system
4. Composing auto tests for given thematic units
5. Completion of individual examples, exercises, case studies by multimedia "presentation" (concrete outputs, animations, sound files and the like).

Courses include study material in form of distance written study texts completed with presentations of lectures (in the case of subjects, which had lectures), example video recordings for explaining more complicated work processes (work with MS Office programmes, programming, multimedia subjects). One part of courses is setting concrete correspondence tasks, which we gradually completed by sample solution.

Revision test is created at the end of nearly every course (created and programmed outside LMS Moodle, but the results of tests are incorporated into total student's evaluation in the frame of given course). Every course ends by evaluation.

During use of courses for distance form of study we try to respect all phases, which from didactical point of view are desirable - introduction of curriculum, explanation, deepening, fixation, repetition and summary of substantial conclusions. Division of individual chapters of the course corresponds to

this three phases. Each chapter begins with formulation of goals and informs students about what they will study in concrete chapter. So it is the same as well written distance supports. The study text itself is divided into subchapters. It is compiled from curriculum explanation and following practising on solved examples, tested on non-solved examples and revised in closing auto test, possibly by correspondence task.

Curriculum is put into chapters from the easiest to the most difficult. Students have the possibility s to test themselves with the help of auto test. In such way they are given the possibility to overlap the given chapter in case that their knowledge shows as sufficient for the given theme. By this current trend of development is accepted – leave linear set conception and structure of a course and put stress on creation of flexible and adaptable course according to skills of every individual. This solution supports learning processes during which students have enough time for curriculum and solution of given tasks. In such processes students also adjust working speed according to their needs and all this is individual in tolerable rate. In future preparation courses we want to include and respect learning style of students and we will adopt going through the course to them and model their optimal way. Study will start by entrance test. This test will result in choosing type of student's learning style. According to student's preferred learning style optimal way of going through the course will be offered to him. This way can be possibly corrected according to continuous testing and comparing.

5. Conclusion

Distance form of study is justifiable and in the future not only on universities. This form is possible to use in the frame of adult education system. Education cannot be understood only as preparation for future job. It should become complex training of person who will be useful part of information society. If we enforce constructive approach in the education technologies area, we will make students to use different applications, which support their own activity. For future development it is optimistic that demand for study and mostly university study increases and let's hope it will increase also in future.

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