ICT Contribution to the Process of E-learning Implementation in the Field of Education

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Abstract: - The article deals with preconditions which are necessary for e-learning implementation into the process of education. When looking around, everybody can see that these days ICT are part of all men´s activities so the computer literacy has become a common skill the importance of which is and even will be increasing in the future. These trends open new possibilities for the educational process and create a new phenomenon in the field of gradual and lifelong education - e-learning. The e-learning provides both advantages and disadvantages, there exist barriers to the process. The aim of this article is to analyze possibilities offered by ICT implementation from the point of view of the educational institution (educators) and educants. The analyzed data were collected in a long-time continuous research process running at the Faculty of Informatics and Management, University of Hradec Kralove, and the Czech Statistical Office sources were used.
The presented data show a positive trend in this field. The availability of ICT has improved both at schools and in households, which enabled to improve the level of computer literacy.

Key-Words:- e-learning, internet, information, ICT, equipment, university

1 Introduction

The adequate ICT equipment and students' computer literacy are inevitable preconditions of running the process of instruction in a new way for those universities which in accordance with their original function struggle to apply latest technical and technological knowledge in the new content and forms of education.

Numerous institutions are trying to provide conditions for developing necessary skills to required level so that students were able to use ICT in the process of learning according to their learning style. Opponents of the ICT implementation declare computers to be trendy and their use redundant. They recommend to work in traditional ways of knowledge transfer. That is why they do not require students to be able to work with computers, neither in common life, nor in administering the study process (creating study plans, enrolment to subjects, exams, communicating with teachers and other students, presenting information etc.), and they do not create conditions for developing these skills. It is clear this approach is not correct and does not correspond to the times of huge technological development. When looking around, everybody can see that these days ICT are part of all men´s activities so the computer literacy has become a common skill the importance of which will be increasing in the future. These trends have opened new possibilities for the educational process and created a new phenomenon in the field of gradual and lifelong education - *e-learning*.

Although the expression has been known for a decade, its definition is not still steady. In the Czech Republic there exist several definitions; the most valuable one was published in Dictionary of Educational Science defining the *term of E-learning is used in the Czech Republic in this English version or it is translated as the electronic learning/education. It includes various types of learning, especially those which use modern technological means, mainly a CD-ROM. Electronic learning is particularly applied in the field of distance and company education.* [6]

The structured description presented in Dictionary of Software says *E-learning is an established business terminology for using information and communication technologies in education. It covers both off-line study (multimedia courses, education via e-mail, discussion groups, information on the Internet), and on-line study (virtual classrooms, collaborative modules, chat, forum etc.).* [8]

The educational approach emphasizes *E-learning can be understood as an educational process in which information and communication technologies are applied in designing courses, distributing study materials, communication between students and teachers and managing the process of instruction.* [17]

In other definitions single tools are described and emphasized, e.g. as follows: *E-learning is a way of*

education which uses presentations, texts with links, animated sequences, shared working space, voice comments, own notes, communication with the lecturer and other students, electronic models of processes etc. [2]

The European Union projects mostly prefer the following definition which says that *e-learning means the use of new multimedia technologies and the Internet with the aim of improving the quality of education, making the approach to sources and services easier, and supporting remote exchange and co-operation.*

During the process of ICT implementation in the Czech educational system the same or similar advantages have been appreciated by both students and teachers as in the other countries, particularly:

- time independence and individual pace for studying,
- possible decreasing expenses in comparison to the traditional way of education,
- high level of knowledge in case of first-quality courses,
- standardized knowledge because(all learners receive the same information),
- student´s evaluation according to the same rules,
- courses provide education to large amount of people at the same time,
- courses can be designed in an interesting and amusing form which addresses more students etc.

On the other hand, possible negatives and barriers to this form of study must be mentioned, e.g.:

- e-learning method does not suit everybody (computer literacy is required at least),
- it is a non-personal way of instruction,
- problems with motivation may occur,
- information is presented in one method which may not suit each student,
- financially demanded technical equipment and ICT technologies are required, etc.

Current university education is organized in three basic forms (Act No. 111/1998, sec. 44, part 4, On universities): the present form, with personal attendance of students; the part-time form, which consists of combination of the present and distance form of study and emphasizes self-study activities; and the distance form, which requires minimum present attendance and is based on managed self-study activities. [19] E-learning can be applied in each of the forms, as it effectively supports not only self-study activities but the present lessons as well.

As mentioned above, the necessary precondition of e-learning implementation in the tertiary education is computer literacy and availability of ICT (computer with Internet access) for both students and teachers.

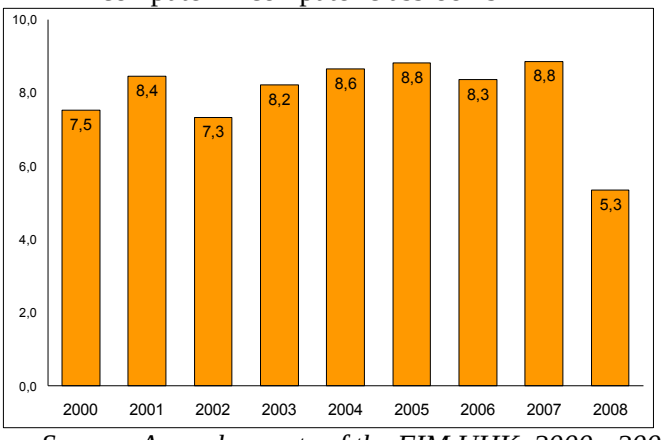
The following part of the article deals with analysis of the presented preconditions of e-learning implementation in general, some data are related to the situation at the Faculty of Informatics and Management, University of Hradec Kralove (FIM UHK), including the level of equipment, student´s situation, students' and teachers' experience in e-learning etc.

2 The level of ICT equipment at FIM UHK

If any university is going to implement e-learning into the process of instruction, there exist basic preconditions which must be fulfilled. Quite a fast development was monitored in the number of computers at FIM UHK in the last decade, which was gradual, and mostly increased from 288 computers in 2007 to 442 ones in 2008. The reason was that the faculty moved to the new premises which provided more seats in classrooms.

As the number of students was increasing in last 10 years, this type of data does not show the real improvement of the situation. Relation between the number of students and computers in computer classrooms shows 5.3 users per 1 computer in 2009. (Fig. 1) Higher number of students per computer (approx. eight) during the last decade was monitored, which was caused by relatively stable number of computers and increasing number of students. Similar trends can be seen at other universities.

Fig. 1 Number of students of FIM UHK per one computer in computer classrooms



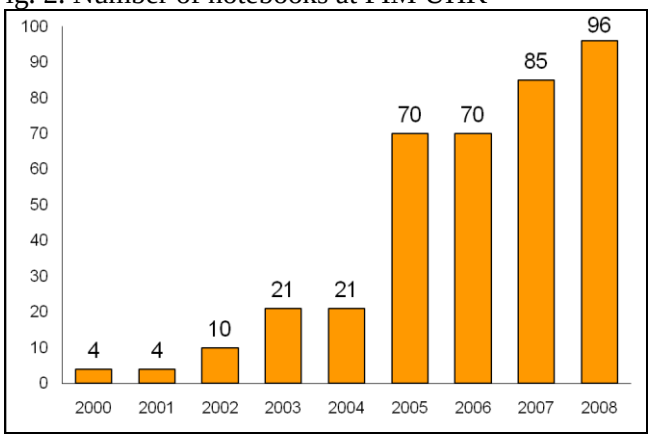
Source: Annual reports of the FIM UHK, 2000 - 2008

Data provided by the Czech Statistical Office show there were 8.6 pupils per one computer in 2008 at basic and secondary schools. But it is necessary to take into account that all computers in each school were included in the number, even those of administrative staff, which are not available to pupils.

Another important indicator is working conditions of teachers, i.e. how the faculty is equipped with computers

for them. Having one computer per one teacher on the workplace is the essential equipment which sometimes is not sufficient. Mobile technologies, e.g. notebooks, are also available. Figure 2 shows the development in this field in 2000 - 2008. There is a substantial difference between the situation in 2004 and 2008, when the number of notebooks increased from 21 to 96.

Fig. 2. Number of notebooks at FIM UHK



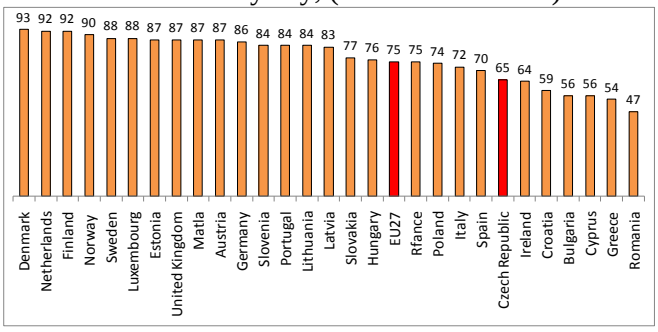
Source: Annual reports of the FIM UHK, 2000 - 2008

It is obvious from the above presented data, that important changes appeared in the last decade and computer technology has become easily available for both students and teachers.

3 Students´ access to computers and the Internet

According to the Czech Statistical Office survey 99 % of students use personal computer, 96% of students use it regularly, 86% of students have a computer at home. Sixty-five per cent of 16+ students in the Czech Republic use the Internet every day, 87 % of 16+ respondents use the Internet once a week as minimum.

Fig. 3. 16+ students in the Czech Republic using the Internet every day, (% of 16+ students)

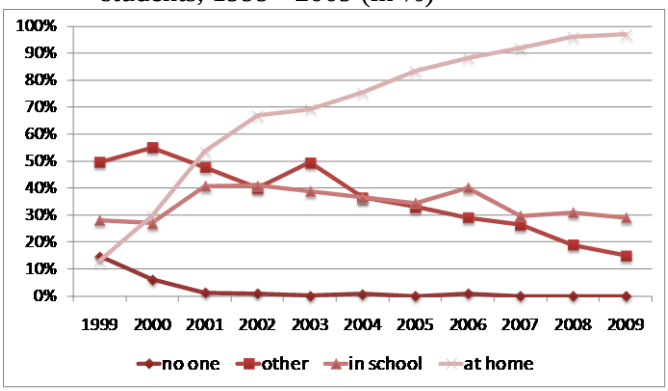


Source: Eurostat, 2008

The frequency is quite high, even though the data show that the Czech Republic is deep under EU average (e.g. in Slovakia 77% of 16+ students use computer and the Internet every day). (Fig. 3)

The presented data correspond to those which have been collected in yearly surveys at FIM UHK since 1996. In 2009/10 academic year 97% of FIM students had the Internet access from home. None of the respondents said s/he had no access up to now. In comparison to 1999 only 23% of future FIM students had access from home (97% in 2009), 15% did not have any access at all (0% in 2009). The data in 2009 increased of 5% in comparison to 2007 which shows the growing trend of the Internet access from home (Fig. 4).

Fig 4. The access point to the Internet, 1st year FIM students, 1999 - 2009 (in %)



Source: Questionnaire survey at FIM UHK, 1999 - 2009

4 The students' use of the Internet for educational purposes and their experience in e-learning

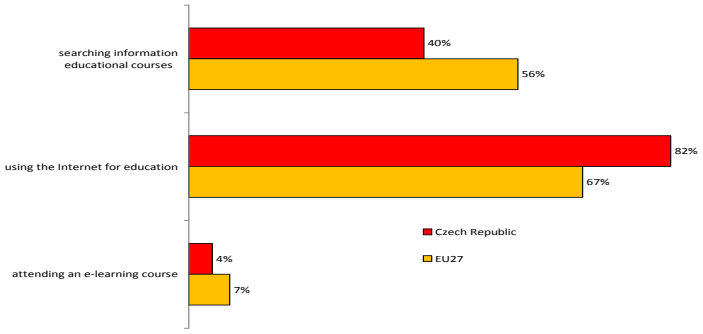
E-learning belongs to long-time priorities at FIM UHK. [4] The first distance course was created in 1998 for basic and secondary school teachers under the auspices of TEMPUS project MUDILT. Thanks to this project the first 6-member team was formed which started to deal with e-learning for further education of academic staff.

In 2001 the process of designing selected subjects in the part-time form of study to the e-subject form in the virtual learning environment WebCT. In the winter term 2001 two subjects were piloted (Database systems II and Computer networks). Positive feedback from students resulted in the decision to continue designing other e-subjects. Since 2002 under the auspices of the OLIVA Project (On-LIne VýukA means on-line instruction) more than 170 e-subjects have been prepared and accredited for both present and part-time students. These activities prove the FIM has had wide experience in e-learning.

The provided analysis of the students' use of the Internet for educational purposes results from two sources: Eurostat and questionnaire survey run at FIM UHK. The Eurostat graph (Fig. 5) shows the extent of

the Internet use for education. Approximately half of the EU27 students have been searching information on study programmes and educational courses there. Czech students' activities in this field are slightly below European average (40%). On the other hand Czech students (82%) are above EU27 average (67%) in using the Internet for education, 4% of Czech students have attended an e-learning course.

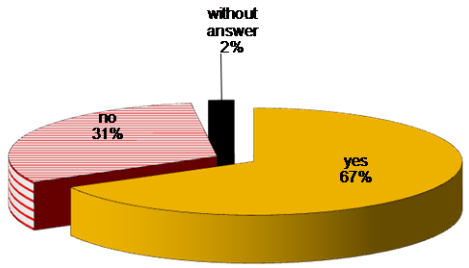
Fig. 5. The use of the Internet by students for educational purposes (% of 16+ students)



Source: Eurostat, 2008

Since 2003 questions on students' experience in e-learning have been part of a survey, e.g. if they have met with the expression e-learning and whether they have had any experience in studying such a course. In 2009 there were 67 % of students who had met with the expression e-learning (Fig. 6), while in 2003 only 50 % of them had known it.

Fig. 6. Knowledge of the expression e-learning, 2009



Source: Questionnaire survey at FIM UHK, 2009

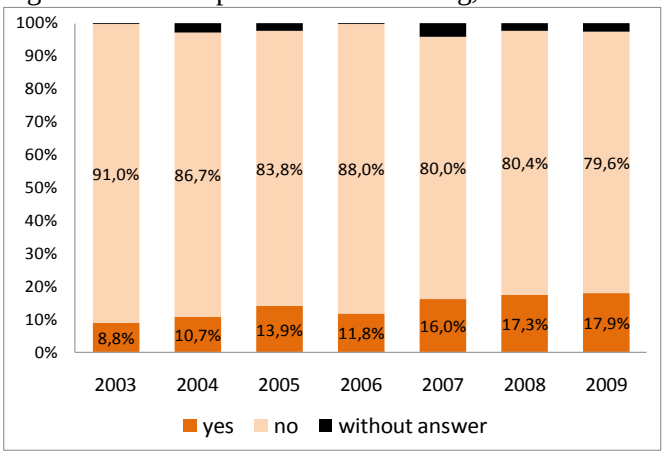
Practical experience in e-learning did not spread in 2003 – 2006 substantially, only about 10% of 1-year students had some experience (Table 1). In 2007 and later the data show slight increase.

Table 1. Attendance of an e-learning course (in %)

	Yes	No	Not answered
2003	8,8	91,0	0,2
2004	10,7	86,7	2,7
2005	13,9	83,8	2,3
2006	11,8	88,0	0,2
2007	16,0	80,0	4,0
2008	17,3	80,4	2,3
2009	17,9	79,6	2,5

Source: Questionnaire survey at FIM UHK, 2003 - 2009

Fig. 7 Practical experience in e-learning, 2003-2009



Source: Questionnaire survey at FIM UHK, 2003 - 2009

4 Conclusions

As it results from the above presented data, the ICT development influenced great deal of population and currently it is understood to be standard. Thus the rate of computer literacy increases as one of the necessary preconditions of e-learning implementation into the process of education at all types and school levels.

Another important factor is the level of ICT equipment in educational institutions. The situation at FIM UHK proves fulfilling this precondition.

Then it is time we started to deal with didactic aspects of e-learning. And what are the results? Are teachers able to apply suitable methods and forms of instruction, create and use appropriate didactic means which are offered by new technologies? Are the new didactic means, i.e. methods and forms supported by digital technologies, able to optimize the cognitive process of creating knowledge? Do students know more after the process of instruction which is supported by ICT than having been taught in the traditional way? [7]

Current approaches to tertiary education mean to tailor the teaching/learning process to latest requirements of the society and technical development. Instruction supported by ICT enables optimizing the process, applying individual learning styles, offers flexibility of time, place and pace of learning and increases efficiency

of the whole process. Computer literacy and ICT equipment having been reached, deep attention must be devoted to the didactic aspects of the process. This is the objective of the Czech Science Foundation project called "Evaluation of the modern technologies contributing towards forming and development university students´competences" which is currently running at FIM UHK.

The article is supported by the Czech Science Foundation project No. 406/09/0669 "Evaluation of the modern technologies contributing towards forming and development university students´ competences".

References:

[1] Czech Statistical Office (online). Available: http://www.czso.cz/
[2] Hewlett-Packard Development Company, L.P. (online). Available: http://www.hp.cz/e-learning/elearning.php
[3] POULOVÁ, P. Blended Learning Implementation - a case study. In *Developments in e-Learning 2003*. Praha : ČVUT v Praze. 2003. s.81-102.
[4] POULOVA, P., CERNA, M., SVOBODOVA, L. University Network - Efficiency of Virtual Mobility. In *EDUTE 2009: Proceedings of the 5th WSEAS/IASME International Conference on Educational Technologies*, World Scientific and Engineering Acad and Soc, Athens, 2009
[5] POULOVÁ, P. Strategies of Implementing eLearning and Blended Learning at the Educational Institution. In *International Conference on e-Learning Souvenir*. Namakkal : PGP College of Engineering and Technology. 2005.
[6] PRŮCHA, J., WALTEROVÁ, E., MAREŠ, J. *Pedagogický slovník*, Praha, Portál, 2003
[7] ŠIMONOVÁ, I. *Využívání ICT v distanční výuce odborné angličtiny na UHK*. Nitra, 2007.
[8] VITOVSKÝ, A. *Moderní slovník softwaru výkladový A-Č,Č-A*, Praha, AVsoftware, 2006
[9] *Annual report of University of Hradec Králové - 2000*. Hradec Králové : Gaudeamus, 2001.
[10] *Annual report of University of Hradec Králové - 2001*. Hradec Králové : Gaudeamus, 2002.
[11] *Annual report of University of Hradec Králové - 2002*. Hradec Králové : Gaudeamus, 2003.
[12] *Annual report of University of Hradec Králové - 2003*. Hradec Králové : Gaudeamus, 2004.
[13] *Annual report of University of Hradec Králové - 2004*. Hradec Králové : Gaudeamus, 2005.
[14] *Annual report of University of Hradec Králové - 2005*. Hradec Králové : Gaudeamus, 2006.
[15] *Annual report of University of Hradec Králové - 2006*. Hradec Králové : Gaudeamus, 2007.
[16] *Annual report of University of Hradec Králové - 2007*. Hradec Králové : Gaudeamus, 2008.
[17] *Annual report of University of Hradec Králové - 2008*. Hradec Králové : Gaudeamus, 2009.
[18] WAGNER, J. *Nebojme se eLearningu*, Česká škola, 2005
[19] Act No. 111/1998, On Universtities