ON THE POSSIBILITIES OF THE EDUCATION PROCESS SUPPORT BY THE MEANS OF ICT IN THE MILITARY UNIVERSITY ENVIRONMENT

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Abstract: Education based on modern information and communication technologies is nowadays acceptable for students of all age-groups. According to the fact that the creation of e-learning study support materials is a very demanding process in terms of time and professional requirements, the military universities in many cases may consider the question of whether this approach to education is possible and suitable for them at all. The paper presents authors' views from two different University of Defence (UoD) departments on some 'pros' and 'cons' that might be actual and important for this type of educational institutions in connection with e-learning.

Key words*: adult education, course, e-learning, English, ICT, military university, teaching.*

1. INTRODUCTION

Modern educational technologies, and e-learning in particular, continually penetrate into all types of educational institutions and all branches of university studies, including military. Integrating Europe and NATO, in the case of military universities, offer new technologies sufficient space for their development and application. Many large firms regard this process as a profitable business activity and their interest and involvement in this field is continually growing.

The military universities should keep pace with this trend. Question of the approach and attitude to these new educational technologies should not be postponed. Generally, in the market economy environment, the question of modern ICT usage and application in education could be converted into the question of a mere survival and future existence of new and especially smaller civilian universities. Authors of this paper work at two fundamentally different departments (technical and humanitarian) and have participated in the e-learning introduction at the University of Defence in Brno in recent years.

2. THE UNIVERSITY OF DEFENCE ENVIRONMENT

The University of Defence (UoD), Brno, the Czech Republic, with its three faculties, was established as a result of transformation process of three independent military universities in 2004.

The UoD is a state institution and belongs to smaller Czech universities as in its accredited branches of study fewer than 1000 students are educated. According to the necessity to guarantee the required quality of education in the accredited branches of study, the calculated per capita expenses in this case are much higher than in larger universities. Generally, the limited financial sources for the development of such a university make the investments decision-taking process for the university management very demanding. Consequently, they must be also very cautious about the investments into modern educational technologies.

Those, who are convinced of the rightness of the permanent requirement to update the teaching process, might be confronted with the opinion that for the limited numbers of students in single accredited study

programmes investments into e-learning are not well-founded.

3. THE FOCAL POINT OF E-LEARNING DEVELOPMENT

The availability of e-learning investments at smaller universities under the conditions of limited financial sources is sometimes quite difficult. Modern educational technologies require not only high-quality e-learning study support, but also the teachers, who are able to use this electronic support in their classes effectively. It is getting more and more obvious that the best tutor of the e-learning course is usually its author, because he fully understands his concepts and constructions and can utilize them in the optimal way. The quality of the e-learning content and the preparedness of teachers to manage, develop, and utilize it effectively, hang together.

The authors of this paper are convinced that the high-quality e-learning, as an instrument for effective education, is making its way successfully in the Czech Republic To attract the prospective students it is necessary for smaller universities to start using e-learning as an effective supplement to their traditional teaching wherever and whenever it is convenient.

According to the considerable initial human and financial sources requirements, it is suitable to determine the e-learning development focal points of the university, to achieve unanimity as for the choice of field application of this technology and the engagement of disposable human resources. For the first contact with this technology and its introduction at a smaller university, it is recommended to choose the e-learning application in that field where there are sufficiently large target groups of students.

At the University of Defence in Brno, which belongs to smaller universities, such target groups are undoubtedly the group of students of English, and of computer and communication technologies basics. The initiative in the field of English language ICT support was taken over by the teachers of two departments – the Language Department and the Communication and Information Systems (CIS) Department [2]. Nowadays in the existing Language Training Centre – a result of the merger of Language Departments of the first two faculties of the University of Defence – there are teachers, who are able not only to use e-learning support, but also to create it. That is how the initial goal in this field was achieved [5].

CIS Department uses e-learning method at the CISCO Networking Academy [3]. The students of UoD can take part in special courses offered by CISCO education programme at the CIS Department. Its staff has prepared the offer of the modules from communication and information technology basics.

4. MODERNIZATION OF THE TEACHING PROCESS - POSSIBLE SOURCE OF INSPIRATION

The authors believe that it is necessary to lay stress primarily on the systematic and high-quality education of the university personnel to secure the permanent modernization of the teaching process in their departments. The good example of the high-quality education in this field is the European Net-Trainers Course, which was organized by the university in Plzeň [4], [6]. This course properly reflected the needs of the Czech environment.

One of the authors took part in the seven-month pilot course, which started at the university in Plzeň in March 2006 and finished in November 2006. Thirty successful graduates were given certificates in February 2007. The regular Net-Trainers courses in the Czech Republic started in March 2007. We recommend this course to all people who are interested in modern educational technologies and who are willing to devote a part of their free time to their personal and professional development. This course is also organized in other European countries, so that there is also a possibility to study it in other European languages [1].

Smaller universities during the transition period to the full use of the e-learning study support should take these recommended steps in the following order:

- To get acquainted with the proven e-learning study support materials with the focus on their content and utilization.

- To lend or purchase the proven e-learning study support materials (courses) from other universities and test them in the local university environment.

- To adapt the chosen e-learning study support materials from other universities.

- To create e-learning study support materials by oneself.

- To exchange and share these materials.

- To jointly create and use these materials in the national environment.

- To jointly create and use these materials in the international environment.

For the successful development of e-learning at a university it is recommended to draw at least a small number of students into this process. The motivation up-keeping of these students and teachers, who participate in the creation of the own e-learning study support materials, influences to a great extent the acceptance of the new educational technology at the particular university and the effectiveness of its use.

The high-quality on-line educational course of the CISCO firm (known as the CISCO Academy) has been organized at the university of Defence for a couple of years. The questionnaire survey focused on the collection of data concerning the possibilities of the use of modern information and communication technologies at the university was prepared, carried out and evaluated in the year 2004.

In the years 2005 and 2006 the e-learning English study support materials were continually created and nowadays they are widely used. It is pleasing to say that also other university departments (e.g. Department of Mathematics and Physics) started to create and use of their own e-learning materials. Regarding the positive reaction of students and users in general, it is possible to presuppose that e-learning at the University of Defence has a very good perspective.

In the following two chapters (5 and 6) we present the concrete examples of the current and planned implementation of e-learning in the areas of language training and communication and information technologies at the University of Defence in Brno.

5. E-LEARNING AS AN EFFICIENT ENGLISH LANGUAGE STUDIES SUPPORT

Work on the existing 'English Language Studies Support' (ELSS) at the University of Defence in Brno (UoD) – as an example of e-learning application - was commenced in spring 2004. The main reason for this step was an intention to provide our undergraduates with an effective support for their language studies, enlargement or at least up-keeping of the already acquired competence in English in the most attractive and modern way. The most expected effect was the emergence of the spontaneous activation of the human factor resulting both in the use of the modern ICT and the orientation on the main means of communication in the contemporary world – the English language.

Our approach was based on the following initial principles:

- ELSS was planned as one of the applications of the information system of the University of Defence.

- The main objective of this system was only to provide support – not the complex solution of the English language studies.

- The creation of this educational system was based on the given rules. On the other hand, it had to be open to anybody who wanted to present his/her interests and abilities in this area.

- ELSS was also planned to be open for all students and the staff.

Our conception of the ELSS was and is still based on conviction that the key to success rests in the application of the following typical principles of 'open learning', 'distance learning' and 'e-learning':

- Openness to everyone,

- Independence of time,

- Independence of pace of studies.

Our goal has always been the inventive application of these principles to meet the needs of ICT support of the English language studies. It has been necessary to reinforce and back especially the individual preparation of

our students by the sensitive and attractive use of the accessible ICT.

The authors' priority has also been the possibility of 'study freedom', which is the possibility to study without being spied by the system.

The created system facilitates efficiently the preparation and perfection of all four language skills that are tested as a part of the prescribed language test in the Army of the Czech Republic (according to the NATO STANAG 6001 norm). Moreover, we have decided to devote a lot of space and means to support English grammar and military English studies. As a result there are six areas involved, the mastering of which guarantees the resulting quality of the whole.

All materials for each of these six areas are saved (stored) in the corresponding sections of support of the system. These sections are further divided into the number of selected categories that are specific for the particular area. Next, each category comprises the so-called primary elements of support (PES), which can be, for example, exercises, study materials, audio/video files, and tests. To other important attributes of the ELSS belong:

• Low requirements for the user's technical equipment and his/her computer skills.

• The possibility for the students to take the role of the primary elements of support authors.

• Spontaneous connection of pedagogical activity of the English language teachers and increase of their competence in the area of ICT.

• The authors' and users' independence of the commercial sphere.

• Non-commercial orientation and openness of the system.

• Provision of space for research, e.g. in the area of implementation of users' primary elements of support adaptation for single students.

Great attention has been paid to creation of clear instructions for work with the system. The 'Guide to Studies' provides all information necessary for the full use of the system by all possible users.

By the end of the year 2006 21 interactive documents with 132 'screens' were created (using the ToolBook II Instructor 8.5 software). On the basis of the MS Word software 86 documents were prepared and another 41 documents (using other software) were added.

The results of the questionnaire research, which was carried out in 2006, showed that these English language e-learning materials were positively received by the students and have become the integral part of their study activity.

Nowadays the number of English teachers who are able to independently create the interactive PES is growing. The students who are willing to participate in this work are also very welcome.

6. COMMUNICATION AND INFORMATION TECHNOLOGY BASICS MODULES SOLUTION

The continually growing dependence of majority university study branches on information and communication technologies requires the necessary stress to be put on this area also in the university study programmes. The important moment is that modern educational technologies based on the use of communication and information technologies make it possible to effectively support the acquisition of the required students' knowledge and skills with regard to different branches of study.

It is a well-known fact that students of different branches during their stay at a university also need to gain different information and communication final knowledge and skills, but it is possible to define the common knowledge and skills basis within the single faculties, which could be developed further according to specific requirements of different study branches.

At the University of Defence the e-learning may be also used (besides the e-learning English language studies support) to form the basic communication and information technologies core knowledge. The bachelor study programme 'Military technologies' was accredited at the Faculty of Military Technology in 2005; it includes 10 branches of study, and is valid from March 7, 2005 to

March 7, 2009. For the approaching re-accreditation the Department of Communication and Information Systems has prepared the offer of modules that cover all problems of communication and information technologies basics.

Discussing the question of how to specify the content and teaching methods of the introductory 'informatics' subject, the teachers from the Department of Communication and Information Systems of the University of Defence came to a conclusion that they will offer the students such an introductory subject in the form of the optional modules. The mechanism of functioning and the utilization of these offered modules will be as follows:

The subject 'Introduction to communication and information technologies' should be scheduled for the very beginning of university studies – as early as in the first semester with 60 lessons granted. It is possible to specify the content of the subject for the whole faculty not only on the unified basis but also in a modified way with regard to the requirements of different branches of study. This modified approach can have the priority.

The subject 'Introduction to communication and information technologies' should be lectured by the teachers of that department, which is responsible for the tuition of these highly specialized problems at the faculty. The department should offer, for example, 20-lesson modules with the following structure to properly specify the subject content:

• Module = [Title, Warrantor, Goals of Study, Study Plan, Literature].

Students can choose three modules from this offer – those that are the most important for each study branch. Three chosen modules from the existing offer would constitute the content of the subject 'Introduction to communication and information technologies' for each individual branch of study. The warrantor of the study branch may also take into account the students' requirements presented by the questionnaire research.

It is also possible to consider the offer of other modules according to students' interests in the form of an optional subject, which could be taught on a full-time or a part-time basis.

The offer of modules should be subject to corrections reflecting the interests of students and departments. Moreover, the structure of the each offered module should be continually up-dated by the warrantor and should also reflect the changing needs of students, departments, and a warrantor, as well. All these materials should be easily accessible – e.g. at the Study Portal of the University of Defence.

The Department of Communication and Information Systems at the University of Defence offers nowadays modules in three categories: Information technologies, Communication technologies, and Information security. The single modules offered in each category are as follows:

• Information technologies: Decision support systems; Information systems and operational-tactical systems at the Ministry of Defence and in the Czech Armed Forces; Interoperability in NATO; Databases and information systems; Computer software and the possibilities of its use; Computer graphics; Algorithm development basics and programming in Pascal language; Algorithm development basics and programming in Visual Basic language; Algorithm development basics and programming in C language; Algorithm development basics and programming in Delphi language; Algorithm development basics and programming in Java language; PHP – web application programming; Operating systems Windows basics; XML basics; Computer networks; UNIX and Linux basics; Specialised software and computer modelling; Computer hardware; Single chip microcomputers and their applications; Modern programmable circuits; Introduction to CCNA (Certified CISCO Network Academy); Information Sources Analysis; Project Management;

• Communication technologies: Modern communication technologies for technical branches; Optical communication systems; Telecommunication technique; Modern radio techniques – focused on VLF technique; Software support for communication technologies – Mathcad, Matlab – including algorithm development basics and programming in these environments; Personal

mobile communication means at military environment;

- Information security: Legislation in the field of information security; Cryptology.

The pilot questionnaire research carried out in March 2007 was focused on the 4th semester students' opinion and brought the following results:

The most important modules for the Communication and Information Systems study branch are: Computer networks, Basics of algorithm development and programming in Language C, Modern communication technologies for technical branches, UNIX and Linux basics, and Communication technologies software support.

The most required modules without respect to their importance for the Communication and information systems study branch are: Introduction to CCNA (Certified CISCO Network Academy), Telecommunication technology, Computer networks, and Cryptology.

Teaching methods in different modules depend on the quantity of students in single groups and on the ability of their warrantors to use the modern educational technologies (e-learning). It is also possible to consider the creation of teaching groups on the basis of the students' preliminary knowledge, or to prepare the individual plans for the best students.

We find it suitable to modify the lectures (with regard to number of students in a group) by introduction of practically oriented parts with the use of computer and communication technology. The basic teaching attributes of all modules must be the teamwork and a sufficient amount of practical activities in laboratories and PC classrooms.

Setting the study goals adequate to requirements of single study branches is the fundamental problem. To make the exerted effort more effective it is also possible to consider the idea of sharing the study materials, exam tests, and the common creation of e-learning study support units. Integration of students into this process is also very beneficial.

Regarding our experience at the University of Defence the current problems associated with the described modules solution and its gradual transition to e-learning study support are as follows: reinforcement of teamwork, greater involvement of students in the process of study materials creation, providing enough space for independent realization and solution of the set goals, and defence of individual and team projects.

7. CONCLUSION

According to the European integration process and necessity of NATO member states military universities co-operation, the authors of this paper think that the mutual co-operation or sharing of the created and existing materials would be beneficial and perspective for all participants.

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