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Why eLearning?

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Abstract:

The building of eLearning, the Internet has been built. The classrooms, in other words the local Intranet networks equipped with systems of learning organization are being built. The computers - the most modern desks - are ready to welcome students. Multimedia devices providing all the imaginable and unthinkable forms of demonstration, as blackboards and presentation software as boxes of chalk - are available for teachers.

Now in this well-equipped building the only questions to be answered are:

- **Who** should be eTaught?*
- **What** to eTeach?*
- **Who** should eTeach?*
- **How** to eTeach?*

*This study tries to answer these questions, and reviews the authors' multimedia curriculum¹ entitled **Research & Development in Military Technology**.*

György Kende – György Seres – Sándor Gönczi:

Why eLearning?

Live and learn - as the phrase goes. However, up to the middle of the last century, in general it was true for those whose gene contained too much curiosity or, they were military men who in peacetime had to participate in trainings and exercises regularly. Most people who went through the shops or took a diploma were able to live on for life.

In the second half of the 20th century development in science, technology and society was so rapid that the knowledge acquired at schools became obsolete many times in the active period of human life, therefore it was necessary to buckle down to learning again and again to keep up competitiveness in the labour market. By the end of the century the want of lifelong learning (LLL) had been formulated.

“Lifelong learning: providing general and continuous access to learning, acquiring and steady renewing knowledge and skills that is essential for sustained participation in knowledge-based society...”²

The conventional scholastic system of education, of course cannot meet this requirement. For this reason – following a thousand-year-old tradition of armies – the big companies themselves organize systematic training of their employees, while for the smaller ones professional educational firms provide systematic retraining.

Beside demand, the 20th century also created efficient means of teaching and learning. In the last few decades, recording motion picture and voice revealed itself at the beginning of the century by means of computer, digital data recording and transmission - in other words info communication technology (ICT) – made technical opportunity of such efficient education that was inconceivable before.

This info communication technology – the possibility of eLearning or eTeaching – today “in small” is already available for educational institutions and organizations of almost every level, which enables the efficient lifelong learning to be organized.

The form of eLearning

The eLearning looks back on a very short history. The first Internet lessons started in 1997³. The conception itself is construed in several ways.

According to the competent committee of the European Union⁴:

“eLearning means using new multimedia technologies and the Internet to improve the quality of learning by facilitating access to facilities and services as well as remote exchange and collaboration.”

According to the abovementioned study² on lifelong learning:

“eLearning:

an interactive teaching-learning process supported by both technology and methodology in a virtual (electronic) environment where the contact between the teacher (mentor, tutor) and the student is realized through ICT.”²

While in Europe there is a debate on the definition of the conception, in 1997 in the United States the Pentagon having the support from the White House launched the Advanced

Distributed Learning (ADL) Initiative⁵, a programme substantiating the widest definition and practice.

“Advanced Distributed Learning (ADL) is a collaborative effort to harness the power of information technologies to modernize structured learning. ADL, therefore, employs a structured, adaptive, collaborative effort between the public and private sectors to develop the standards, tools and learning content for the learning environment of the future.”

“The vision of the ADL Initiative is to provide access to the highest-quality learning and performance aiding that can be tailored to individual needs and delivered cost-effectively, anytime and anywhere.”

The SCORM⁶ (Sharable Content Object Reference Model) established by the ADL initiative in 2001 integrated into itself most of the tutorial-learning standards elaborated by various organizations - Aviation Industry CBT Committee (AICC)⁷, Alliance of Remote Instructional and Distribution Networks for Europe (ARIADNE)⁸, IEEE Learning Technology Standards Committee (LTSC), IMS Global Learning Consortium⁹ etc., and by 2004 it became a standard adopted all over the world by the most prevailing frame systems like Learning Management System (LMS)¹⁰, Learning Content Management (LCMS)¹¹.

The essence of the SCORM standard is an organization of training units – lesson, topic, field or chapter - built from Internet elements into Sharable Content Objects (SCO) (Fig.1). The course (subject) developed from objects ”packaged” in this manner is “controlled” by a Learning Management System (LMS) on the basis of data contained in a special descriptive-adaptation-managing file (Fig.2).



Figure 1



Figure 2

However, to make the picture full it must be said that the eLearning begins to gain ground in education of IT experts, in learning languages and in continuative education of experts of multinational companies. The frame systems supporting multimedia education and online distance teaching are used in the intranet systems of more and more Hungarian companies and educational institutions, but proper Hungarian educational content provided does not allow, in general, full utilization of their capabilities yet.

In the **Hungarian Defence Forces** eLearning is coupled up with distance teaching. In 2004 the Distance Teaching Directorate of the Zrínyi Miklós National Defence University (NDU) made a survey in the circles of staff members and students. Distance Learning Director at NDU Miklós Vörös in his study¹² titled *“Are we prepared for distance learning?”* states:

“In the Hungarian Defence Forces progressing towards professionalism it is a strategic objective to maintain and develop professional skills. Decreasing strength and less and less opportunities for replacement make it more difficult to organize the schooling of regular students. Thus the role of continuous self-education and the need for distance teaching as one of the forms of its realization increases.”

“...in the following years the distance learning will play a significant role in the training and retraining system of the Hungarian Defence Forces, ...”

To achieve this aim, there has been established the frame system of military academic distance learning within the frame of the IT infrastructure of the NDU.

The extension of eLearning

So, the building of eLearning, the Internet has been built. The classrooms, in other words the local Intranet networks equipped with systems of learning organization are being built. The computers - the most modern desks - are ready to welcome students. Multimedia devices providing all the imaginable and unthinkable forms of demonstration, as blackboards and presentation software, as boxes of chalk - are available for teachers.

Now in this well-equipped building the only questions to be answered are:

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- **Who** should eTeach?;
- **How** to eTeach?

The answer to the question of **Who should be eTaught?** is relatively simple: everybody - sooner or later.

After its "invention", human **speech** as the first teaching aid became a common form of teaching for thousand years – he who wanted to learn that first of all had to learn to speak.

Invention of **writing** and then **printing** greatly increased efficiency of knowledge transmission accumulated by the by mankind – literacy is a prerequisite for learning for centuries.

The use of means of **image** and **motion picture** and **voice recording** in teaching and learning became general and efficient only by the application of **multimedia** devices in eLearning, digital data recording and transmission and displaying, computers, and local and global computer networks – “digital literacy” has been a prerequisite for eLearning.

Nowadays not everybody meets this requirement yet – they can only be taught in conventional way. However, the generation growing up in kindergartens with “childproof” computers will surely be an eLearner.

But even today there are target teams for whom digital literacy – user-level knowledge of computer and Internet – is one of the job requirements. For example, eLearning can be an ideal solution for employees of big firms, public employees and professional strength of the Army to meet lifelong learning requirement.

The question of **What to eTeach?** can be answered similarly: everything – sooner or later, that has to be acquired within an organized framework.

eLearning enhances not only efficiency of conventional theory teaching, but the most varied virtual models, simulators and character games can greatly improve cost-effectiveness of practical training as well.

To answer the question of **Who should eTeach?** is much more difficult.

In a conventional school it is the teacher who gives a lecture on a specified or selected curriculum, coaches students and then checks or examines and evaluates acquisitions.

The question of **Who teaches?** comes up in the case of a multimedia curriculum package elaborated for acquiring a set of knowledge – subject, topic etc. – by eLearning.

- Is it the teacher, who selected and worked the curriculum up?
- Is it the graphic designer, who composed the presentations facilitating understanding?
- Is it the information specialist, who wrote the screenplay?
- Is it the narrator, who gave the lectures?
- Is it the programmer, who recorded the result in a digital data medium or an assigned network address, in a form easy to handle by the student?
- Is it the tutor, who holds intercourse with the students during distance learning?

It would seem the simplest solution when some one person would perform all these tasks, however it is impossible and unnecessary to prepare every teacher for studying so many professions. The knowledge standards mentioned in introduction make it possible to organize curriculum-objects worked out by prominent experts of the country or a linguistic area into content- storehouses from where teachers, schools or other educational institutions can collect material for compiling curriculum suitable for their aim. Of course, eCurricula necessary for subjects of institutions of higher education and special courses require mostly individual working-out, and close co-operation from participants performing abovementioned tasks ranging from working-up curriculum to checking acquisitions.

To the question of **How to eTeach?** so many answers can be given as many forms of education, schools, subjects and teachers exist. The only undertaking of the authors of this study is to present the model of eLearning of a university subject named **Research and Development in Military Technology**. This model has been worked out for BSc, MSc and PhD students participating in regular and correspondence or distance education at the Bolyai János Faculty of Military Technology of the Zrínyi Miklós National Defence University, but it can be used for related courses, self-instruction or distance teaching of students and research-workers interested in the subject, as well.

An eLearning model

The multimedia curriculum **Research and Development in Military Technology** suitable for eLearning is based on the conventional lecture notes of the subject. The content of the chapters practically corresponds with the text of the lecture notes. So, what is the surplus for what it was worth developing the multimedia version of the curriculum?

The curriculum contained on a CD has an Internet portal design and starts automatically. This enables students sitting in front of the monitor of a computer to surf among any points of a library and the world, if they have Internet connection. Students can display the text of the curriculum in a printable form and can print it for them – in compliance with the copyright.

In addition to the curriculum itself, the portal contains presentations illustrating lectures and sources. Furthermore, the CD also contains authors' references underlying the chapters; their publications recommended for deeper studying and further research; and presentations of their papers read on scientific conferences. Moreover, on the CD there are a lot of important

and interesting documents, which can be accessed by a mouse click in a proper phase of learning and would otherwise be found after a long search and effort.

The curriculum **Research and Development in Military Technology** is available in the distance teaching system **ORACLE-iLearning** of the intranet of the NDU and thus, having proper authorization, it can be accessed through the Internet. It enables students to exchange their experiences on **open forums**, to release outcomes of their research on **bulletin-board**, to **talk publicly** with each other and their tutor and, to obtain soon new teaching packages containing updates of the curriculum.

The hello screen¹ contains access of steps necessary for starting, and continuously viewable table of contents facilitating orientation through the curriculum and surfing by the reader's wish.

In case of the multimedia version of the curriculum interactive presentations and video clips help understanding instead of the figures of the printed lecture notes. Interactivity makes it possible for student not only to build by mouse clicking the appropriate layout, model or flow chart by his wish, but also to surf independently among interdependent flow.

To close a given topic of the multimedia curriculum **Research and Development in Military Technology** students can check necessary encyclopedic acquisitions by the use of self-checking tests before elaborating prescribed task settling the topic and adequate to their training level.

The multimedia curriculum **Research and Development in Military Technology** can be used in all forms of education and research at universities.

The curriculum available on multimedia CD and **ORACLE-iLearning** system of the NDU as the supplement to the printed lecture notes or as its alternative provides an opportunity for *students participating in regular and correspondence education* to learn and prepare for examination independently, but for the *teachers* giving contact lessons it provides presentations to illustrate lectures. During eLearning the students can use the services – **forum, chat and bulletin-board** – of the **ORACLE-iLearning** Learning Management System from the class-room of any campus of the university or from college-rooms through the Intranet. *The students participating in distance learning* themselves can organize their learning and can hold intercourse with *the tutor* of the curriculum through the Internet. After taking over the curriculum and related CD and guide, students have to apply in a prescribed e-mail format to the tutor.

The application e-mail contains:

- the applicant's personal data;
- the applicant's availability data;
- the month of the planned examination;
- the planned user name and password for the application to the tutor;
- in relation to the multimedia curriculum
 - hardware and software required for its application;
 - level of knowledge needed for learning it;
- other data the student intends to inform the tutor.

The tutor informs by e-mail the applicant about acceptance of the application and the information necessary to register at the Intranet system of the University. Then, the applicant in

accordance with his individual plan begins the process of learning during which he can use services of the **ORACLE-iLearning** distance learning system of the University through the Internet – as regular and correspondence students do.

After completion of a topic (chapter, case study) the student can do a self-checking to test his encyclopedic acquirements, then he elaborates the task adequate to his level and sends it to the tutor by e-mail, who after evaluation informs the student by e-mail about the result.

When all the prescribed tasks gained positive evaluation, the tutor, via e-mail too, allows the student to apply for examination.

Having admission to examination the student elaborates the class-task adequate to his level and sends it to the address of the tutor so that it is to arrive at least one week before the chosen date of the examination.

The comprehensive course-task will be evaluated during the examination.

The multimedia CD can also be useful for research-workers studying certain topics of the subject **Research and Development in Military Technology** because – in addition to the curriculum itself, the publications and presentations of the authors – the CD makes it possible to access a great number of related bibliographies directly or through the Internet.

We have tested the CD containing the multimedia curriculum with the contribution of two groups of students participating in university courses and PhD education. We have taken into account their comments and recommendations when we finalized the material.

We are testing English version of first chapter of the multimedia curriculum by a website: **Bases of military system modeling**¹³

REFERENCES:

¹ Kende György – Seres György: **Haditechnikai kutatás-fejlesztés multimédiás egyetemi tananyag**, ZMNE, 2005. (<http://www.jata.org/drseres/tavoktatas/>)

² Gegesi Kiss Pál - Dr. Mlinarics József - Dr. Soltész Péter - Udvardi-Lakos Endre. **Az egész élethosszon át tartó tanulás és az infokommunikációs technológiák együttes alkalmazásának a nemzetközi-, a magyarországi helyzete és a jövőbeni fejlődés lehetőségei.** *Tanulmány, 2004. (192. oldal)* (<http://www.matisz.hu/tartalomfejlesztes/csatolmany/lifelonglearningtanulmany040809.pdf>)

³ “e-Learning should be used strategically and not just as a tool that everybody uses” **Interview with Tony Bates, professor at the Universitat Oberta de Catalunya (Open University of Catalonia)** . (http://www.elearningeuropa.info/index.php?page=doc&doc_id=5943&doclng=12&menuzone=0&focus=1&lng=en)

⁴ **Distance Learning and eLearning in European Policy and Practice: The Vision and the Reality** *Policy Paper of the European ODL Liaison Committee approved by the Member Networks Released 17 November 2004* (<http://www.elearningeuropa.info/index.php>)

⁵ <http://www.adlnet.org/aboutadl/index.cfm>

⁶ <http://www.adlnet.org/>

⁷ <http://www.aicc.org/>

⁸ http://www.ercim.org/publication/Ercim_News/enw33/forte.html

⁹ <http://www.imsglobal.org/>

¹⁰ <http://www.e-learningconsulting.com/products/learning-management-system.html>

¹¹ <http://www.learningcircuits.org/2002/apr2002/robbins.html>

¹² Vörös Miklós: **Készen állunk-e a távoktatás bevezetésére?** *Humán Szemle*, 2004/2-3-4.

¹³ <http://www.jata.org/drseres/ceepus/>