ZRÍNYI MIKLÓS
NEMZETVÉDELMI EGYETEM
Doktori Tanács

DR. UNIV. MISKOLCZI ILDIKÓ

„VIRTUÁLIS INTRANET HÁLÓZAT ALKALMAZÁSI LEHETŐSÉGEI A POLGÁRI ÉS A KATONAI TÁVOKTATÁSBAN"

című doktori (PhD) értekezésének szerzői ismertetése és
hivatalos bírálatai

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1. THE TOPIC OF THE SCIENTIFIC PROBLEM

At the beginning of the 21st century our accelerated pace of living has dramatic effect not only on our life but also on economy, society and our work. The prerequisites of effective work is on the one hand such knowledge that lies on firm bases but is adjusted to the present and future requirements, and on the other hand the ability to use this knowledge quickly, precisely and in a wide range in our ever changing walks of life. However the ways of acquiring the necessary knowledge is not always regulated or stated clearly.

Until the middle of the previous century if somebody had a certain qualification, they were able to make a living with it before the age of retirement without the need of updating, brushing up their knowledge. At the same time it is also true we cannot use the knowledge we got in our teens or twenties through our entire life. Not only the continuous economic changes but the ongoing restructuring of the labor market as well make it necessary to keep our qualifications up–to–date, to develop the need to take part in retraining courses or to obtain new qualifications. In order to be recognized in our workplaces during work as an employee who has firm, precise and varied knowledge and to be competitive with the freshly graduated young generation the importance of self training has grown even greater. Besides civilian life it applies to military life even at a larger degree. S**olders** in the army **are required to have such up–to–date and specific knowledge and to be so fully competent users of it** so that they should be able to make the correct decisions in all kinds of ever changing situations at all times.

In the second half of the 20th century and at the beginning of the 21st century our way of life has not only made a u–turn, but **quick and significant changes have been made in all walks of life including the IT sector and education. Information society requires us to constantly use and update our mental resources among many other things.** As a consequence of the information revolution, computers, computer networks, and such ICT equipment have appeared that enable us to **learn new things quickly and efficiently**. However at the same time the acquired knowledge becomes obsolete even more rapidly. We can declare that the age of Guttenberg in education ended a long time ago. Nowadays we get most of our knowledge not (just) by turning the pages of books. Everybody knows the saying that a picture is worth a thousand words; a video, multimedia content is worth several hundred times more. Not to mention the fact that in some cases it is easier and quicker to learn new things if they are accompanied with a model or a simulation during the learning process. At the end of the first decade of the 21st century **mobility has become a basic requirement in education as well**.

Individual learning during adult age is an extremely difficult process, and not everybody is capable of it. Even if the learner is fully competent, acquiring new things individually in any topic requires a great level of patience, self–discipline, organizing skills and the ability to use all these competences together.

Individual learning means more than just memorizing texts from course books, because almost anybody can read. Understanding what you read means a completely different thing, and also it is a higher level of the learning process when it is assisted by certain means that can minimize the teacher's involvement or it can even substitute them completely.

One alternative of this learning process is distance learning and/or blended learning (using multimedia materials online during teaching). Distance learning as a method and form of learning including eLearning plays a unique role in our education system. Its importance and application has been growing as adult learning does not necessarily involve taking a break from your job any more. Training, retraining, further training should be organized in such a way that the candidate should be able to get applicable and up–to–date knowledge while doing their work and being able to meet all their other, family related, social obligations. eLearning – as far as content is concerned – is suitable for any kind of transfer of knowledge, except for some specially practical subjects. Organizing and conducting further military training courses and general promotion courses, which were examined in my doctoral research, is a special field of study.

My research focuses on the development of such eLearning model that can be used in distance learning, which is suitable for organizing and conducting military promotion courses, and I also examine the requirements for its applicability in my research. I expect such a result from my research that makes the full procedure of organizing and conducting general promotion courses and their thorough administration possible with the help of modern, 21st century information communication theories, methods and facilities.

2. AIMS OF RESEARCH

1. **To analyze and systematize** the connection with distance learning, eLearning and the requirements for their applicability in civilian and military further education, to systematize the features of online and traditional campus based education. **To analyze** the legal background in line with the intentions towards digitalization in the 21st century.

2. **To examine** the process of organizing and conducting military promotion courses at Zrínyi Miklós National Defence University, then **to find** the strengths and weaknesses of the organisation process of the courses and as a result of it:
   - **to make a suggestion** on modernization
   - **to present** the possibilities of conducting courses in the virtual space.

3. **To study** the literature on cloud computing – as a possible web–based eLearning solution, to determine the requirements for its application in education. **To examine** the security issues of cloud computing and with the results of the study **to determine** the requirements for its application in education.

4. **To define** the criteria of a closed virtual educational environment
   its basic modules
   extra services and its module for maintaining communication
   the module responsible for cooperative online work in virtual space

5. **To create** an own closed intranet network using cloud computing for educational purposes which:
   - works safely taking all safety measures into account
   - Enables synchronic and asynchronic work as well as communication in virtual space
   - makes conduction online examinations possible
   - and proves the safety of the system's work with **testing**

3. METHODS OF RESEARCH

In line with the discussion of the problem and the objectives, my theme requires complex research methods.

In the first phase of my research I have done a wide range of research in order to analytically study the relevant literature. The study of the mentioned literature included a general research of the field and the distance learning system of the Zrínyi Miklós National Defence University concentrating on specific military applications. As a result of the first phase I compared the general and specific conclusions of the synthesized, collected knowledge to the analytical theory of virtual learning environment that is considered to be correct by me and I summarized the results of it in my hypotheses.

As the next step of my work I did research, made experiments and observations with information technological, modelling and simulating methods to prove the hypotheses. I carried out these experiments several times to reduce, minimize the degree of uncertainty and to prove the usefulness of the scientific results. I have published all the parts of my research's results in scientific forums and presented them in conferences.

4. SHORT DESCRIPTION OF THE ACCOMPLISHED WORK CHAPTER BY CHAPTER

In the **introduction** I show the topicality of my research's theme and its aims, means and methods .

In the **first chapter** I point out the relevant literature of eLearning and the most significant literature from the point of the research's theme. I analyze the legal background of distance learning, I study its content from the point of view of digital learning. I create a 21st century learning model and I prove its applicability in the following chapters. I compare eLearning with the help of my own system to traditional campus based learning, and as a result of it I conclude that distance learning and eLearning should be approached from different aspects.

In the **second chapter** I examine what changes have occurred in the distance learning system of the Zrínyi Miklós National Defence University since its introduction. I define the place of military promotion courses in the system of distance learning. I show the legal background of conducting general promotion courses, examining their technical, human resource requirements, and I make a survey of the currently available technical equipment. I examine the process of education, using

the studied literature I analyze and explain the experience gained from conducting the first courses. As a result of it I point out its strengths and weaknesses. I examine the learning needs and possibilities of soldiers on a mission. I make a suggestion on the modernization of distance learning with learning methods of eLearning.

In the **third chapter** I examine the applicability of cloud computing, one of the most modern ways of eLearning of the 21st century in distance learning. I consider the reasons, advantages, challenges of its usage one by one. I analyze the most critical points of this technology in terms of safety and legal issues. I examine the most prominent providers of cloud computing from the aspect of eLearning using the example of Google, the one with the most experience and the largest number of innovations.

In the **fourth chapter** I define the general and special military requirements that are needed for the safe operation of an intranet system. I map the users' needs and determine the requirements of the providers for a working web–based virtual educational system.

In the **fifth chapter** I create the general model of the closed virtual system, describe the features and responsibilities of its modules, and determine the relations between the modules of the system. Using the general model as a base I create a specific working model. I prove its operability with testing.

In the **final chapter** I conclude with the new scientific results and make recommendations for the use of them and for further research.

5. FINAL CONCLUSIONS

The use of modern ICT equipment in any walks of life has become possible as a result of the globalizing processes of the 21st century, the ever increasing quantity of information, the sky rocketing amount of accumulated knowledge which becomes obsolete faster and faster and the development of technology, furthermore its use has become compulsory because of the social and economic changes. EWorld has become part of our everyday life, this way playing larger and more significant part in education as well. The starting point of my doctoral research was to examine the applicability of eLearning within the realms of distance learning in civilian and military education especially taking the military promotion courses into account, which are organized for soldiers on a foreign mission. My primary objective was to plan such a modern system in the virtual space that uses the services of the virtual space and gives the possibility for modernization of the distance learning system used in military higher education.

During my research I established the fact that the process of organizing and conducting military promotion courses at Zrínyi Miklós National Defence University – although it doesn't live up to all the technological requirements of our modern age – heads in the right direction to find the optimal solution. At the same time it is well known that Zrínyi Miklós National Defence University has long traditions in distance education, modern LMS (Learning Management System) – Oracle iLearning, Ilias – and eLearning materials appear in the educational process. During my initial research I made the conclusion that these elements do not come together as one integral system in the virtual space, in the global and continuously increasing world of cloud computing.

With the study of a wide range of international and domestic literature I determined the relation between distance learning and eLearning, the requirements for their applicability in special professional fields (military) in special geographical environment with special "educational" equipment.

With the help of analytical comparison I pointed out the differences between traditional campus–based education and eLearning.

In my paper – among many other things – I analyzed the structure and practice of conducting distance education and general promotion courses at Zrínyi Miklós National Defence University, and during my study I pointed out its strengths and weaknesses. Using the results I made suggestions how to modernize it.

To reach the goal of my research, I have made careful studies and I have been operating such an up–to–date Learning Management System (LMS) that can be used successfully to conduct general promotion courses meeting the requirements of both IT and the profession. I analyzed the system of Moodle and Illias in terms of applicability. I conducted an empirical study and it turned out that these systems are able to manage the whole learning process, still they have such deficiencies that we cannot state that they meet all the demands and requirements of the teachers and students during the learning process.

From it I drew the following conclusion that it would not be a good solution to the problem that I was researching to simply integrate distance learning courses – e.g. general promotion courses – , which was the focus of my research, into a frame system. I have tried to find the solutions to the deficiencies with several different methods. With logical planning – by revealing and analyzing the structure of the present "system" at Zrínyi Miklós National Defence University, with the result of the study in the Learning Management Systems (LMS) and with the use of the method I created to solve the given problem – I defined, created the requirements for a closed virtual learning environment then I shaped a model with the help of today's most modern technology, cloud computing. I created a system according to the model and tested it. The results proved my system to be working and applicable.

The final conclusion of my research is that the Ilias Learning Management System operating both at Zrínyi Miklós National Defence University and the College of Szolnok, and as I proposed, the most modern services provided by the internet and being integrated into the system using cloud computing could be a fully integral part of the system functioning at the university and the college, respectively. This way a modern virtual space based on the digital world using digital equipment could be created that meets the challenges of the era, works according to the course students' personal needs, makes the tutors' work easier and gives the chance for the officers who are on a mission to complete the promotion courses that they are obliged to do.

6. NEW SCIENTIFIC ACHIEVEMENTS

I analyzed and systematized the relations between distance learning and eLearning, the requirements for their applicability in civilian and military higher education. I created such a lifelong learning model that supports and shows how the military carreer can function.

I systematized and created a system of the requirements for comparing traditional campus base education and eLearning.

I defined the criteria of a closed virtual learning environment.

I created my own closed virtual intranet network using cloud computing for teaching purposes, and with testing I proved it functions safely.

7. PRACTICAL USE OF THE RESEARCH'S ACHIEVEMENTS

The virtual campus model created and tested in my thesis is applicable in the distance learning programme of the Zrínyi Miklós National Defence University, especially in conducting general promotion courses. (Its applicability is currently under scrutiny by the Hungarian Ministry of Defence.)

My paper can be used as a source for further research in the in the field of distance learning including electronic distance learning, eLearning.

8. RECOMMENDATIONS

research in the possibilities of electronic identification
research in the conductibility of written tests