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E-LEARNING AND IMMERSIVE LEARNING IN MILITARY EDUCATION

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Abstract: *An e-learning system is a model that integrates new information and communication technologies in an educational and training proccess which is based upon pedagogical principles and current didactic approaches as well as on European standards.*
Immersive Learning is a modern technique of knowledge delivery used to simulate the reality of critical incident management. According to it, students are immersed in a realistic environment in which they can experience the decision-making process and understand the complex problems involved with it.The integration of the current military e-learning system in the Media Grid Immersive Education initiative would inevitably lead to high level performance of the education system.
How effective would this sort of integration be? And how could it be achieved?
These questions and more other issues related to the subject of e-learning and immersive learning in military education will be answered by the essay below.

Keywords*: e-learning, immersive learning, system, distributed*

I. INTRODUCTION

Immersive Learning provides, among other things, promising technologies, especially such as the video-interactive ones, the connection to knowledge networking and collaborative tools. Computers can play some amazingly patient teachers, urging the creative thinking and promoting entrepreneurship. However, technology alone does not represent a solution, requiring new educational models. Thus, modern educational concepts derived from studies of renowned scholars such as Jean Piaget [1] and Seymour Papert [2], insist on an individualized education, practically on teamwork and a guide to finding information. These concepts not only require technological assistance, but they would be almost impossible without computers.

Unlike computer-based learning systems, Immersive Education is designed for student employment in the same way that video games are today, "by keeping the player's attention awake" [3]. Immersive Education allows both individual learning and the collaborative one, both of which can be distributed via the Internet or through media such as CDs or DVDs.

In the military, the general purpose of distributed learning is providing access for the military and civilian personnel to high quality education and instruction, according to the needs of everyone, everywhere, anytime and at a low price and includes distance learning, distributed advanced learning, interactive multimedia training, distance video training and other learning technologies, as well as the support infrastructure.

Distance learning is when the learner and instructor are separated by distance or time, using traditional tools such as audio and video media, video tapes, video-conferencing, CDs and correspondence courses.

Advanced Distributed Learning (ADL) is distributed learning in the conditions of improving the learning technologies, communication and computers to the latest standards, offering learning wherever and whenever it is necessary.

II. THE SYSTEMS' ROLE IN E-LEARNING

The representation of reality with the help of the concept of system highlights especially the interaction, correlation, relationships between all the elements of the whole, i.e. its organization. The management science regards the whole nature as a hierarchy of systems which include themselves and surpass themselves, which also signifies the actions that contribute to this aim. But the creation of a system does not mean the complete and final elimination of disorder but only reducing them to a smaller or greater extent.

A set of entities united by the interaction and interdependence, forming a whole, is called system. The system is achieved by a set (combination) of component parts which gives the system a structuralist character. The parts of which the system is made are called entities, which have a real or abstract character. The interaction and interdependence between entities provides the system with functionality by connections between entities. Entities do not possess the functionality of the system. Any system is a whole, a purpose. The specification of also means its delimitation from the environment. Any system can consider itself as an entity, that means as a part of another system.

The most difficult problem in implementing a system, whatever it may be, is change. The success of change depends primarily on whether the management and control activity provides a clear and fluid transition from the old to the new system. In order to implement an e-learning system several stages have to be done, of which the establishing of goals and objectives, evaluating the existing resources, establishing the e-learning strategy, its implementation and the evaluation of the results and ongoing redefinition of the strategies are compulsory. Also, an e-learning system is one of the most obvious examples of replacement of the "traditional classroom located education " [4].

An e-learning system consists of three main components - management, pedagogical and technical component, including hardware and communication, the e-learning platform (Learning Management System - LMS), the educational content, tests and simulations, and system users (students, teachers, tutors, course designers).

The management component coordinates the educational component and technical component in terms of curriculum, for which purpose it allocates resources to users and coordinates all activities within the e-learning system. The educational component meets the requirements of the management component by applying the pedagogical principles necessary for the dissemination of the educational content. The technical component is responsible for the hardware and software infrastructure and collaborates with the educational component to the development of educational content.

Today, ADL means web based, structured learning, using the latest technology. Advanced distributed training is found and distributed as e-learning. In all the definitions the used keyword is learning, so the general concept covers the domain of education and, by extension, of training.

E-learning is increasingly more imposed where mobility, speed of response and resource availability are key factors for success.

Technology meets the pedagogical approach by using e-learning standards. All components of an e-learning system are closely interrelated, but some of them have special relationships with others. The infrastructure provides technical support for the e-learning platform, it allows the exchange of information between system users. The e-learning platform allows the dissemination of the courses and the management of the students according to the educational intercession. The educational component is supported by teachers who are involved in creating educational content but is also found in the software tools that the e-learning platform provides.

The main goal pursued in the e-learning system is to provide a quality education for students mostly by "activating the human mind" [5].

The learning style will have to be individually tailored for each student, and this can not be done without technology. Another problem in education today is the situation when students learn in large groups, which leads for many to feel frustrated when forced to respond and make a mistake. The major advantage that computers involve is precisely the elimination of the state of frustration, offering the learning opportunity without coming up tight and feeling the opinion of the others.

III. THE E-LEARNING EDUCATIONAL SYSTEM IN THE MILITARY ENVIRONMENT

Advanced distributed learning is the latest initiative in a long campaign aimed at making best use of the informational advantages and conducting education and training simulation. For various military and civil organizations, advanced distributed learning means different things and is implemented in different ways. In its definition there is still a fundamental policy, namely that it should make training and support performance, whenever and wherever necessary: in the classroom, in garrison or even field-fighting training.

Advanced distributed learning is destined for individual use by students, soldiers and decision makers, and also for collective use by groups of individuals and teams, crews and staffs. This form of dissemination of information meets the above goals through the application of modern technologies such as computer based training, interactive training based on multimedia, intelligent tutor systems, simulations based on network performance for electronic systems support, web-based training.

The internet is rather preferred for the delivery of educational materials than satellite or terrestrial broadband lines. The security issue is of great importance, in this regard the internet being considered as the cheapest and most flexible alternative. Regarding information security, at this time it is considered to be better if the materials are not classified.

By using the e-learning system, military personnel will have access to a modern educational system of the highest quality, designed for specific needs in the field, that is available anytime, anywhere with minimal costs.

The implementation of an ADL in the military is a very complex and important activity that is done under a clear and realistic vision, step by step, starting from the current situation, based on available resources and pursuing the ultimate goal set.

In terms of the user, learning management systems and training are two generic functions - training and testing.

In turn, learning resources have two main functions - providing additional resources for student learning and student counterisolation by providing a means of communication (synchronous and asynchronous) with the teacher and other students and collaborative working means .

From another point of view, e-learning system functions are visible and transparent.Visible functions are accessible to the student (access control, testing, training, etc.). Transparent functions are system made without student involvement, in order to support the learning process: coordinating of the system and modules, resource management, error handling, updating of the resources and knowledge, keeping records of the work in the system, analysis of the students' situation.

In terms of type of users accessing the system, it has functions for students, tutors, teachers and administrators. The functions for teachers involve the development of courses and learning objects, modifying the existing ones, viewing the students' situation, creating tests and modifying or removing the current tests, putting the tests in correspondence with the learning materials and the pursued objectives, and the communication with the members of the system. The administrative functions relate to the maintenance of the technical system, adding or removing modules and tools, adding resources and training materials, access control and access rights, etc.

The succes of learning depends on the quality of the learning system design. For achieving the aimed objectives and goals there is a need for rigorous design. This can solve problems such as the performance, scalability issues, abandonment. Also, a rigorous design has advantages such as reduced development costs, consistent aspect of the system, quality control and standardization.

The design of training and learning is a process of needs analysis and goals and of developing a training system to meet the those needs. The maximum challenge in designing instruction and learning for e-learning is to make the connection between technology and education.

Design education is seen as both process and as a discipline, science and current reality. As a process, design development training means systematic training of the specifications using the theory of training and learning to ensure the quality of the training process. The learner needs analysis should be performed and its goals and then a system that meets those needs and objectives has to be developed. It includes the development of training materials and activities, testing and evaluation of training and all student activities. As a discipline, design education is that branch of knowledge

dealing with research and theories about learning strategies and processes to develop these strategies. As science, design training refers to the creation of detailed specifications for the development, implementation, evaluation and maintenance of situations that facilitate learning on any level of complexity, in any context. In reality, a new idea that can be developed and implemented may appear at any time of the design, adding all the details necessary to comply with design science.

An important component of e-learning is the pedagogical approach. There are five key elements that can determine how well students are involved in their training and learning process, namely entertainment, interactivity, control, usability and personalization.

Any learning process over the Internet or Intranet must have a certain amount of "entertainment". The pages of text and drawings are not enough to create interest and keep the learners effectively connected to the vibrant and interactive website. Except for the technical limitations that may arise in the course, there is no reason not to use multimedia. Entertainment is generally a function of sensory stimulation, but the ultimate goal, learning, should not be ignored, but stimulated. Possibilities to achieve this include backgrounds and borders, images, photographs, animation, sound, video, progressive themes and stories, each with its own contribution to learning.

Application design should attract visual attention but not distract from content. Coloured 2-D and 3-D images capture attention and enhance students' imagination (plus, the 3-D dimension adds warmth and creates an exciting experience for the student). Pictures provide visual dynamics and relevance to the real world, sometimes being preferred to words. Animation can clarify concepts that can not be traced only through text, even the simple animations have entertainment value. Narration should be limited to 15-20 seconds per page or learning object and should apply directly to the student for the best effect. Sound effects offer a dramatic impact and a touch of realism to practical exercises and simulations. Video combines the best features of image, movement and sound, even weak video fragments may represent a training for better understanding and increased relevance. Progressive themes and stories are those elements such as solving a mystery or a "day in life" that can create an appearance of drama, involving students and ensuring the continuity of lessons in their minds.

A good educational product does not only present information to the students, but involves them actively in the learning process. In the absence of the instructor, *interactivity* is achieved through the creation of points the student has to respond to or to take the initiative in the application. The fundamental techniques of interactivity include rollover sites, hyperlinks, and drag and drop questions (multiple choice answers, true-false and matching words-expressions). The latter, combined with graphics, pictures, sounds and video are limited only by the imagination of the designer of educational courses.

Current students do not want to become prisoners of a restrictive program. The liberal aspect of the Internet is the fact that it allows users to *control* their access. In the learning environment of e-learning there should be a greater degree of freedom for students to assimilate information. Students who play a direct role in management remain more involved in the learning process.

As programs introduce more interactivity and free control it is essential that all elements remain "friendly". What can be intuitively obvious to designers and developers is not necessarily the same for students. If the trained people do not understand what to do, they will not wait long to understand. Frustration has a converse effect to engaging, leading to premature abandonment of the course.

The satisfaction of having something created just for you should not be neglected. Materials that are too generic are not as exciting as those that focus specifically on student needs. Therefore, the customization of the application increases the employment degree by connecting with the student on a personal level and should not affect the educational content, but it can show it in a more attractive and entertaining way to the student.

Absorption and active involvement of students is a critical factor in any educational environment. Programs designed to train students at various levels have the greatest chance to achieve their educational goals.

From an educational and pedagogic perspective, quality educational content should determine effective and deep learning.

Long distances, the saving of financial resources and lack of time made distance education become a more than convenient solution for many students. The distribution of educational materials

by mail is in its sunset period. New communication technologies are increasingly conquering the area owned by the previously practiced model, providing the key element was missing: interactivity.

Learning is not a passive process, and exams are not anymore related to the presence in front of the examination board. Training the military in the theaters of operations through distance education ensures quality and reduced costs for the military system.

IV. CONCLUSIONS

The emergence of the e-learning phenomenon creates new perspectives, but the psychological effects on those who will be working in this new field should not be neglected. The teachers ability to adapt to the new way of working required by the e-learning system is the key to success. Do not forget that current teachers are trained as intellectuals and teachers by the formal education system, their value was based on the accumulation and their appreciation of this system. The new system cancels part of this value, which is a frustration of the individual. Moreover, lacking youth specific flexibility, teachers must learn to be different than they were before. The change is radical, so it is difficult to overcome.

An educational e-learning system is closely related to other disciplines - communication theory, learning theory, cognitive psychology, information technology, science education, systems' theory, behavioral psychology, whose action is manifested at various levels, from students to choosing an educational platform.

The development of artificial intelligence, the progress in the semantic web, the emergence of new communication technologies, web 2.0, the touch-screen and minidevices will continue to provoke the e-learning systems. The challenge is moving from formal to informal, from the information structured in pieces of knowledge and we ask ourselves whether e-learning systems, namely e-learning platforms longer justify their absolute master role by providing structured information. The answer is easy, all e-learning platforms have already implemented web 2.0 features.

The current trend is to integrate in an e-learning platform as many modules with different functionalities, sometimes changing the fundamental role for which they were originally developed. The affordability limit for the system administrators is exponential with bringing new services and features and the appearance of dozens of software modules that can create chaos in the system. If we integrate today all these software modules, tomorrow it is possible to disintegrate and without wanting this, we highlighted a general principle of progress. The teacher's role in the future will change and, even if, in certain circumstances, a machine can play information easy to absorb, it can not guess, create and imagine value.

References

[1] Jean PIAGET (1896-1980) was a Swiss psychologist. His work is known worldwide and is still an inspiration in fields like psychology, sociology, education, epistemology, economics and law.

[2] Seymour PAPERT (born 29 February 1928 in Pretoria, South Africa) is a mathematician at MIT (Massachusetts Institute of Technology), educator, researcher in computer science and a pioneer in artificial intelligence and inventor of the Logo programming language.

[3] http://members.immersiveeducation.org/about (accessed 13. 02. 2012)

[4] Ecaterina Livia TĂTAR, Cezar VASILESCU, Aura CODREANU, Luiza KRAFT, *„Equality and E-Quality in Education – Worlds Apart or Clicks Apart?",* in Proceedings of the 7th International Scientific Conference „eLearning and Software for Education", Volume II, Coordinator-Ion ROCEANU, Bucharest, April 28-29, 2011, University Publishing House, p. 96.

[5] Ramona Olivia STEFANESCU, Marinel-Adi MUSTATA, "*Psychology, Advertising and Lifelong Learning in the Knowledge Society*", in Proceedings of the 7th International Scientific Conference „eLearning and Software for Education", Volume II, Coordinator-Ion ROCEANU, Bucharest, April 28-29, 2011, University Publishing House, p. 160.