ADAPTING THE EDUCATIONAL PROCESS TO THE TECHNOLOGICAL DEVELOPMENT

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***Abstract**: This essay proposes an analysis of the impact between the fast evolution technology and the military education, as well as part of acting directions for the future. The Romanian military education system is a state education, integrated as a subsystem in the national education system. The essential coordinates of this particular education system are given by the evolution of several factors: the national education system, the military institution, the Romanian society as a whole, and the international environment.*

Nowadays we are witnessing the expansion process of the distributed education forms (e-Learning) in different developed states, and the high attention paid within NATO to the modern education methods based on Internet or computer networks capabilities (Web, e-mail, online lessons).

One of these paper work goals is to assess the present situation of the Romanian military education system from the point of view of the IT equipment quality and quantity, and of the communication infrastructure. The next important phase stands in the implementation of the Distributed Remote Education, component of the Information System for Military Education Assistance.

***Keywords:** Romanian military education system; Remote Distributed Education; e-Learning; modern education methods*

I. The military education within the information process of the romanian society

The Need to Promote Modern Educational Methods in the Military

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The military education is a state education, integrated as a subsystem in the national education, its essential coordinates being determined by the evolution of the national education, evolution of the military, of the society and the international environment.

Reshaping the military education is part of the national educational reform and of the military transformation.

In order to have a modern education several measures are needed to orientate the educational-instructive processes on coordinates imposed both by the social order and by the research results in the field of education policy.

The military education diversity and complexity, its needs of integration, the budgetary allocations, and the disposal of the education institutions on the national territory impose a progressive and coherent information technology insertion.

Nowadays we are witnessing the extension process of the distributed education (*e-Learning*) in the developed states and the growing attention given in NATO to this modern form of education based on Internet (*Web, e-mail, e-news*).

The great potential of this system of education is mainly provided by the elimination of the time, place and study pace restraints. The e-Learning systems could be utilized by compact groups or independently as a complementary component of other training systems designed for individuals separated by long distances. One of the major advantages of this system is that the education could be accomplished at home or at the working place, anytime and everywhere is possible.

The changes in the social and economical life drive to human trends reorientation, transformation of the social priorities, revision of the attitudes and ideals. The developments of the new information technologies and of the means of communications create new requirements and issues for the conventional system of education.

These technologies extend the education beyond the limits of the traditional classrooms and campus up to homes, museums, libraries and working places.

During the last decade many transformations took place with a special effect over the military education and training. Meanwhile the technology evolved in such a manner that determined a significant change of the theatre

of operations with a direct force over the military education and training requirements.

The technological transformations continue to generate new possibilities for the diversity, complexity and dynamics of the armed forces structure, and for the associated knowledge.

Exploiting these possibilities at their true potential has implications for the military education and training infrastructure and organization and needs a rethinking of the entire training process.

This transformation and rethinking process cannot be done over night but during a gradual evolution where the analysis and experimentation will alternate and will intersect with large scale implementations. Major changes in communications and computers infrastructure lead to revolutionary changes in the technology of education systems. The convergence towards the new technologies was built during many years of research and experimentation, over many stages of evolution.

Remote Education, e-Learning, Distributed Remote Education

Education is defined as being the knowledge, skills and practices acquirement by integrating the training and education into a complex system.

The remote education is based on diverse learning technologies. These could be divided in two categories:

- Synchronous
- Asynchronous

The remote education programs mainly use the *synchronous* learning technologies which are valuable in ensuring the remote training and education, where the students are physically separated from the instructors.

These technologies require that the students are gathered together to certain hours in previously defined places even if they are separated from the instructor. The experts name this type of synchronous technology as "remote education".

In the Romanian education the education institutions use the Remote Open Education (ROE). The Academy of Economical Studies started to use a classical ROE in 1999, and from the IT implementation point of view has defined the following goals:

- The development and maintenance of Internet site at the level of coordinating director;

- Virtual courses;
- Electronic newsletter;
- A virtual library;
- Electronic admittance.

The distributed remote education is based on *asynchronous* learning technologies which ensure the training and counseling without any meeting time and place for the students. These learning technologies depend on the computers technology for both teaching and learning processes.

Combining the traditional teaching that relies on computer and multimedia interactive technologies with the new intelligent simulation capabilities based on Web, we can talk about the "distributed remote education" technology.

The education methods previously described could be characterized as follows:

(a) Remote education

- Spatial separation without the physical presence of the teacher;
- Education based on courses;
- The courses make possible the learning process without the physical presence of the teacher;
- Doing homework could be seen as well as learning without the presence of the teacher;
- It is typical asynchronous and individual;
- From time to time, some courses will occasion contacts between the student and the teacher, by social and didactical reasons.

(b) E-Learning

- Students and teachers are separated;
- The education could be synchronous and collaborative;
- It is using the synchronous and asynchronous communication facilities based on Web (e-mail, forums, group and individual working spaces, audio and video conferences);
- Resources sharing;
- Virtual studying communities;
- Education through a computer network connection.

(c) Distributed remote education

•It is the education where the primary interaction is done with the Web technology support;

•An advanced and subject oriented technology is used for greater freedom and control of the student, due to network and interface intelligence [1].

The distributed remote education is an evolution of the remote education relying on the collaboration of the reusable objects standard versions, of the networks and of the education management systems.

The distributed remote education could combine the traditional education methods with new, simple, coherent study programs. It could be developed in virtual classrooms with minimum investments and low costs of application.

The application of the new learning technologies allows overpassing the barriers imposed by a strict program, the obligation of a "school day" being eliminated. When the student has the necessary time and motivation for learning, any time, space or location restriction disappears. Students have a greater control over the place and the moment for acquiring the information. They have greater responsibility for their own study and they are more receptive to the quality of information.

2. The actual stage of the technical support. Documents to regulate the information technology implementation in the military education

The Actual Situation of the Communications and IT Support

The IT implementation in the Romanian society involves changes both at the military institution level and military education. In the military education institutions created, in the last years, conditions to develop IT activities through the following:

•IT laboratories;

•Computer networks;

•Hiring IT experts;

•Connection to INTERMAN/INTRAMAN computer networks.

The main elements which make possible the implementation of a modern education method in the military are:

•The National Military Communications Network (RMNC), being in an advanced stage of modernization, development and functioning;

•Local computer networks/sub-networks from education institutions;

•Military and civilian IT experts;

•The SIIMAN program (The Integrated Information System of the Ministry of Defense);

•The Agency for Military Information Systems and Services – the specialized structure of the Ministry of defense, authorized for activities of assistance, projection and implementation in the IT field.

The military education institutions are provided today with IT laboratories for specialty courses, IT laboratories for foreign languages study, computerized publishing houses and multimedia laboratories for the most types of education structures.

The Ministry of Defense internal computer network – INTRAMAN – represents the physical and logical foundation of the Integrated Information System of the Ministry of Defense (SIIMAN) and it is an assembly of communications, computers, databases, software and IT services which ensures the Ministry of Defense's users with the information exchange and with the resources sharing in electronic format.

SIIMAN holds as a main element the communications infrastructure (INTRAMAN and INTERMAN), that is supported by RMNC network which is re-projected according to the needs of data and images transmissions, with faster protocols which ensure a more reliable and precise transmission. SIIMAN relies as well on its optical fiber communications own support made of a backbone developed for the Ministry of Defense HQ, central directorates, General Staff HQ and armed forces' services HQs.

The Distributed Remote Education - Component of the Information System for Military Education Assistance (SIMIL)

The implementation of the Information System for Military Education Assistance (SIMIL) in the Romanian Armed Forces is carried out within the SIIMAN program. This system defines all the IT subsystems and services which assist the education and training activities types: high school, military school, application school, service academy, and training and education centers of the Ministry of Defense.

SIIMAN provides IT products and services for all the components of the Ministry of Defense (General Staff, departments, directorates etc.), so

that the users are able to work collaborative, to access information and resources from any location, to interconnect with any other user in the network in data, voice or image communication keeping the security imposed by each system.

SIMIL provides with information systems (laboratories, remote education etc.) the educational processes of instruction and improvement within the military education institutions (colleges, university education and post- university education) and of the centers of excellence.

3. Distributed remote education programs in the Romanian Armed Forces

The Land Forces Academy has developed a program based on three software applications using a server matrix (main memory).

The program of the Naval Forces Academy is based on a software application, ”*Learning Management System*” (LMS), using a server matrix (main memory) of some authorized software applications.

The program of the Military Technical Academy uses available resources, namely equipments and software applications bought under a Romanian – Netherlands common project.

The program of the National Defense University has as a main purpose the development and the distribution of digital content according to its own university curricula, especially in the fields of national security, crisis management, communication and public relations, humanitarian law, CIMIC, NATO – crisis response operations and so on.

A Department for Distributed Remote Education was established at the National Defense University, in accordance with the provisions of the Governmental Decision 1011/2001 regarding the organization and functioning of the remote education and of the education with low frequency in the university education.

The National Defense University is partner with the NATO Defense College in Rome for spreading the ”Introduction to NATO”, ”European Security Defense Policy” and "United Nation Institute for Training and Research" (UNITAR) courses.

4. The implementation strategy of the distributed remote education in the Romanian Armed Forces

Implementing such a system is a complex activity. Thus that implementation is performed according to a clear and realistic vision, step by step, starting from the present situation, based on the existing resources and following the final goal.

Making an integrated system designed for the remote courses dissemination respects the existing national legislative framework and the NATO official documents in the field. As we mentioned before, at national level there is the Governmental Decision 1011/2001 regarding the organization and functioning of the remote education and of the education with low frequency in the high education institutions. According to this normative document, standards were issued regarding the remote education by the National Commission of Academic Accreditation and Evaluation.

The Governmental Decision 1011/2001 and the respective standards impose to the education institutions to create specialized structures, called departments, which are responsible to ensure the education plans for remote courses. Outside these provisions no courses could be organized with the recognition of the Ministry of Education, Research and Youth and study diplomas cannot be issued.

Taking into account that reason, we consider that a two level approach is realistic when an e-Learning system is to be created:

1. Education Level. It will comprise all the military education institutions which function according to the national laws regarding the education and that has to distribute digital content for courses included in education plans and programs. Within these, specialized structures should be established (National Defense University already created such a structure) that are to enter in the academic accreditation and evaluation process. These specialized structures will provide courses according to the professional evolution requirements of the military personnel established together with the Human Resources Management Directorate. This type of courses should be open and accessible on Internet, controlled by different security measures regarding the access, by the remote education departments of each education institution.

2. Training Level. It will be oriented toward issuing and distribution of digital content for short term courses designed for improving training of different military personnel categories oriented to certain tasks and missions. The content of these courses, according to the level of

classification, could be exclusively disseminated on INTRAMAN network and/or on the Internet.

First step in projecting a pilot program for distributed remote education stands in writing down a list of objectives that should mainly comprise the following:

- The demonstration that by applying this program the requirements regarding the military students training should be satisfied;
- Comparing analysis of the learning programs to be installed according to the needs in the field;
- Locations for the control, development and supervision of the training programs;
- Directions for using the program;
- Databases where the human resources and their skills could be evaluate;
- A balance to establish the costs, profit and the ways to recover the investments [2].

In order to get notable effects, the projects of the pilot programs for distributed remote education should firstly identify the training forms, the requirements imposed by the field of study and the learning method, establishing in the meantime the costs, the working time and the level of correct use of the technology by the students. If during the program other needs or requirements are identified, these will be included later on in the program.

The General Staff' responsible structures ask for the task list established by the military education institution and discuss about this with the program directors. The resulted information return to the director of the pilot program who together with the military education institution draw up a selection test for the students to benefit from the Advanced Distributed Learning (ADL) program.

The education content of the ADL pilot program provides a collaboration prototype with the course programmers, designers and teachers. The development is oriented to create informative and interactive study objects that should be a challenge for the student and could be reused by the teachers considering the course organization on study objects agreed by the students. In order to accomplish this purpose, a standard protocol to establish a course of action is concluded.

The assessment of the ADL program is done according to a cyclical model in order to have a good costs planning. For example, if the pilot program has satisfactory results during five months, it should be repeated since a single functioning cycle would not be enough to consider it as a success or a failure.

Successful application of the pilot program is the responsibility of all involved factors, from the program and education plans projection, establishment of the courses on different domains, to the training of the teachers and experts. The military structure has to establish the didactical norm, the training requirements, the agencies to provide the personnel and the courses to attend.

Most of the courses could be taught online. The most suitable domains for online courses are those with a standardized content and methodology (i.e. information technology, technical courses etc.). This is the case with the courses organized by the Communications and IT Directorate – basic, intermediate and advanced IT courses that could be attended at: the Military Technical Academy, the Training Center for Communication and IT, the Agency for Military Information Systems and Services, the Land Forces Academy, the Naval Forces Academy, and at the National Defense University. The courses portfolio could be established by every structure that subordinates training centers [3].

The most important existent e-Learning center in Romanian Armed Forces is that belonging to the National Defense University offering specialized services for all educational structures in the military education system.

A substantial part of the courses specific to the technical education could be adapted to this training form (operating systems utilization/ administration, databases and computer networks, projects management software etc.).

BIBLIOGRAPHY

"US Army's Advanced Distributed Learning Vision", Department of Defense Library, 2001.

"The International Relations and Security Network's e-Learning Project, ISD e-Learning Project Description", Zurich, 2003.

Communications and IT Directorate, "The ADL Conception and the Implementation of this Education Form in the Military", 2006.