

Possibilities of choosing innovative E-learning technologies

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Abstract

The purpose of this approach is to present and validate some possibilities of choosing innovative e-learning technologies that the teachers in higher education in the field of military sciences can use in the teaching-learning process. The author considers that in the conditions of a modern university education that is adapted by the most demanding requirements regarding the quality and performance of the teaching act, technology is an important factor during the educational activity in the higher military education. The peculiarity of the military sciences field is that the teaching-learning process, even if it uses specific innovative e-learning technologies, is also based on practical activities, which cannot be entirely carried out using only these technologies. Therefore, the novelty of this approach is represented by the proposal of the accomplishment of the two objectives of the research, carrying out two case studies using two models of analysis (ACTION and SECTIONS methods) through which to offer two options for choosing a technology necessary for the educational process.

Keywords: E-learning technologies; innovative technologies; ACTION model; SECTION method.

1. Introduction

As teachers in military higher education, the field of military sciences, we often have the opportunity to identify and put in the position to choose the most appropriate teaching-learning method. Under the conditions of a university education adapted to the most demanding requirements regarding the quality and performance of the teaching act, technology is an important factor during the educational activity. The purpose of this article is to identify ways of analyzing the teaching-learning methods that use innovative *E-learning* technologies that will produce positive effects on the educational system in the military sciences.

The hypothesis of this approach assumes that if technologies occupy an important place in the military sciences, then there is the possibility of adapting the teaching-learning methods and to the innovative E-learning technologies. For this purpose, two case studies using two similar analysis models, identified in the international educational environment, which represent the inspiration for this approach, are set as objectives of the research. In this sense, the ACTION (A. W. Bates, Tony Bates, 2005) and the SECTIONS (A. W. Bates, Gary Poole, 2003) methods are used and are the main tools to validate the working hypothesis and to achieve the proposed purpose. Technologies occupy an increasingly important place in education so that the field of *E-learning* is one of the most technologically advanced because of the most innovative technologies aim to cover the need in the field. This aspect is shared by specialists from other areas as well: “*E-learning*, especially when offered online, can greatly increase the opportunities to access information and other resources. This can be particularly important when relevant information and expertise are not available locally and therefore cannot be used for classroom instruction.”(ICAO Council, 2016)

2. E-learning in the Military Sciences

The term *E-learning* has an Anglo-Saxon origin, being adopted in the current international language and extended from its primary meaning. Today the term refers to teaching-learning activities and educational activities through increasingly modern electronic means. In a general framework, *E-learning* means all the specific activities carried out in the educational field in which communication means and information technologies are predominantly used. "In essence, e-learning is a computer based educational tool or system that enables you to learn anywhere and at any time. Today e-learning is mostly delivered through the internet..."(Epignosis LLC, USA, 2014). The most used and handy technologies are the computer and multimedia electronic devices, which are used as a means of teaching-learning-evaluation through communication in the virtual environment. In a particular framework, *E-learning* is understood as a form of distance education, organized by specialized educational institutions, which realizes the educational process through a particular method of teaching-learning, adapted to certain educational objectives. The presentation of the topics is done sequentially with the help of computer technologies that use innovative hardware and software and the communication is done through the Internet. The aspect is approached and detailed in specialized works, most authors emphasizing the essence of the term: "*E-learning* represents the interaction between the teaching/learning process and the information technologies [... ..] covering a wide spectrum of activities, from computer-assisted education to fully-developed online education."(Iuliana Dobre, 2010 *apud* Brut, M., 2006) Having presented some aspects that underline certain general characteristics of the *E-learning* domain, it is further utilized in this approach, a hypothesis demonstrated in paper *E-learning technologies, necessary but not sufficient in military sciences* (authors Scipanov Lucian Valeriu, Scipanov Dănuța Mădălina), which states that the e-learning technologies used in the teaching-learning process in the field of military sciences are necessary but not sufficient.

The peculiarity of the military sciences field is that the teaching-learning process, even if it uses specific innovative technologies E-learning, is also based on practical activities, which cannot be entirely carried out using these technologies.

The factors that characterize the teaching-learning activity in the field of military sciences are institutional and professional in nature, or action, temporary and spatial in type:

- institutional;
- professional;
- actional;
- temporal;
- spatial.

The factors of institutional nature refer to the structure of the military organization, the specific regulations, and procedures, the resilience of the military organization. The professional factors refer to the access to information, the classification level, the field specializations. The action-type factors refer to the possibility of carrying out activities by observing military regulations, rules of conduct, etc. Temporary factors refer to the time periods when the teaching-learning activities can be carried out, depending on the planned training cycle (instruction-operationalization-maintenance). The factors of spatial type, refer to the working environment, place of activity, specialty (land, air, naval) and domain (surface, air or sea). For all factors mentioned above, we must be paid great attention to the resilience of the military education system, which, due to tradition and conservatism, may slow down the implementation of technology. "Some organizations and their employees may reject e-learning (or other learning activities) because of the norms and values of the society to which they belong. Some cultures that value learning in the presence of a qualified teacher, for example, may reject e-learning or accept it with more difficulty. The opposite may occur in places where using technology is culturally accepted or valued." (ICAO Council, 2016)

It is honorable that the current leaders of the military higher education institutions are open to innovation and promote the principles of modern education, in which *E-learning* technologies occupy a quite important place.

In the particular case of military art, a component of the field Military Sciences, taking into account all the factors that can influence the educational process in this particular field, the participation in tactical-applicative exercises, is carried out by combined methods, which even if they need technical and communications means, as a rule, are also carried out with the help of classic means and materials such as maps, plans, typefaces, procedures, etc.

Practically, in this case, the educational process is carried out adaptively to the existing technologies, but these are more quickly working tools than educational methods.

To see which are the most suitable innovative e-learning technologies in the teaching-learning process in the military field, two case studies will be performed by using appropriate methods, which provide a different answer on how to adapt decision-makers on the choice of teaching-learning methods that use these technologies.

3. ACTION Model Learning

This method (ACTION model learning) is useful in the e-learning field because it includes a logical scheme that can be used as inputs for analysis software specific to innovative technologies. The peculiarity of the method is that during the teaching-learning process, the participants can adapt their teaching-learning methods during the process, by permanently evaluating the effects that occur, i.e. the results.

Thus, if the objectives change, the knowledge accumulated up to then can contribute to the best decisions, depending on the experience of the participants, and the interaction with external factors. This method is based on inductive reasoning, with a slight intuitive characteristic.

The teaching-learning process cannot be carried out using a single technology, therefore, there is a need for a selection procedure of the best technology from a wide range, through which the teaching objectives can be achieved. Thus, the manner of selection will have a considerable impact on the educational process through the effect it produces, which is why it is important to make it known.

ACTION model for technology selection includes the next component for analyzing: Access; Costs; Teaching & learning; Interactivity & User-friendliness; Organizational issues; Novelty; Speed. (see Fig. 1)

Adapting this analysis model to the selection of an optimal technology required for the teaching-learning process in the military sciences, the paper will try to identify those answers according to the proposed model that will give us an orientation towards an optimal solution.

For this, the types of questions identified in the ACTION method have been adapted, so that for analysis, the following questions and answers can be used for each criterion.

Next, it is performing an analysis based on the ACTION model, through which it validates the usefulness of the method in identifying the best technology in the field of military science.

-ACCESS - With this criterion, it is possible to analyze the accessibility and flexibility of potential users to innovative technologies

Question: How accessible is this technology for master and doctoral officer students?

Answer: Technology is accessible to all master and doctoral officer students or for a percentage of them. In this case, the percentage is identified and we evaluate how this impediment can be overcome.

Question: How flexible is it for officer students, master, and doctoral student's degree?

Answer: The technology is very flexible, flexible or less flexible. This answer can identify the fact that there is a risk that can be quantified.

COSTS - This criterion aims to identify the costs of technology implementation, the benefit/cost ratio, and similar variants.

Questions: What are the cost structures of technology? What is the unit cost for a master and doctoral officer student? What are the opportunity costs vs other technology choices?

Answer: It is being evaluated the costs for procurement, implementation, maintenance for the entire technology but also other related costs (personnel, operating, licenses, etc.). The amount identified can be evaluated and reported as needed, the benefits, the efficiency, the cost per participant, etc. Under these conditions, there is enough information to provide an image of the extent of the investment and whether it is worth buying, compared to other technologies identified on the market.

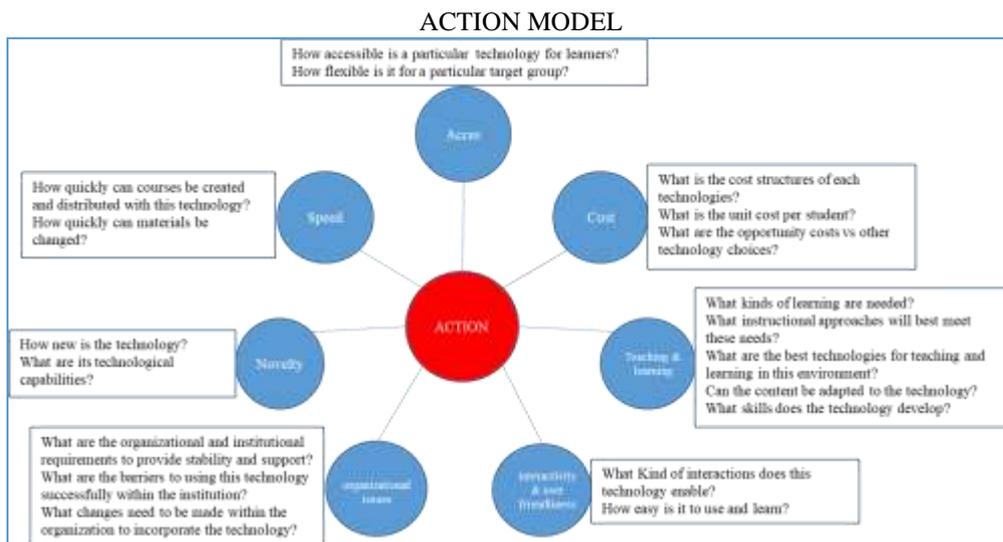


Fig.1. ACTION MODEL for E-learning technology selection (adapted from T. Bates)

TEACHING & LEARNING - This criterion provides an indication of the efficiency of the educational process.

Questions: What kinds of learning are needed? What instructional approaches will best meet these needs? What are the best technologies for teaching and learning in this environment? Can the content be adapted to technology? What skills does the technology develop?

Answer: It is identified the learning methods that are appropriate to the technology or which teaching-learning methods are recommended. It is identified which methods are appropriate and useful to the field of military science, which is an area close to the branch of social science, with interference in engineering, mathematics, history, geography, etc.

Also, the possibility of adapting the educational content to this technology is evaluated, or conversely, it is evaluated whether the technology supports these contents. It is evaluated which objectives and competencies are developed with this technology. In this case, it can be considered that a percentage of over 50% of favorable answers, allow the educational process to be carried out under optimal conditions.

INTERACTIVITY & USER FRIENDLINESS - This criterion considers the degree of interaction between participants and between participants and technology, the attractiveness of the technology, the ability to work with it.

Questions: What kind of interactions does this technology enable? How easy is it to use and learn?

Answer: To be followed if the technology allows the interaction between users if it is friendly, easy to understand, permissive in use. These issues, even if they tend to be subjective, can be easily identified.

ORGANIZATIONAL ISSUES - this criterion aims to identify the problems of the organization of the military educational institution, what obstacles or syncope of use might appear during the use of technology, eventually we can identify remedial solutions and development proposals.

Questions: What are the organizational and institutional requirements to provide stability and support? What are the barriers to using this technology successfully within the institution? What changes need to be made within the organization to incorporate the technology?

Answer: Military institutions usually have high degrees of trust, so this suggests stability and real support for the implementation of new technologies. This criterion needs a faster analysis at the institutional level, at the command team level, at the leadership level. Therefore, it is not sure that solutions would be found favorable to the implementation of innovative technology.

NOVELTY - this criterion allows an analysis of the opportunity of the technology from the point of view of its novelty on the one hand but also from the point of view of the novelty that it generates.

Questions: How new is the technology? What are its technological capabilities?

Answer: The novelty of the technology would have a great impact only if it adds value to other systems, but the major advantage is the potential it offers, an aspect that can be easily identified by the evaluator.

SPEED - this criterion allows an evaluation of the speed of implementation, adaptation, and acceptance of the technology on the one hand, but also of the contents of the themes to this technology, on the other hand.

Questions: How quickly can courses be created and distributed with this technology? How quickly can materials be changed?

Answer: The answer is not difficult to identify, as each teacher has already quantified the effort they need to make to create a course that fits the technology. Sometimes the exchange of technology is easier, sometimes harder, but I'm sure the effort of the teacher will not be in vain. From the point of view of the speed of implementation of the technology, this is not a too important criterion, because of the opportunity is finally identified to be implemented in an honorable time. In my opinion, the most important factors that underlie the efficiency of innovative technologies in the field of military sciences are those that are defined by the ACCESS and COST criteria. From the point of view of the costs of implementing new technology, these are not as high as the valuable technology, the actual costs being variable depending on the complexity of the systems used, which will be compensated anyway. Over time, the costs of designing, implementing, and operating an innovative technology will be adjusted to a level of bearable access to a respected institution." As a general rule, e-learning is costless to design and develop than classroom instruction, but much less costly to deliver and repeat over time. True cost assessment must, therefore, consider initial design and development, and delivery over time." Regardless the costs, any new technology implementation in the educational system has an effect on the organization. Depending on their complexity and destination, one can also identify the place and role that technology has in the educational process, so that each technology is particular to a particular field and it is assigned a teaching method, which does not always reach all educational objectives. In this situation, it is highlight in the field of military sciences, the discriminatory character of technology.

4. SECTIONS method

Another identified method, which determines the choice of the best technology for carrying out the teaching-learning process in the military sciences is the SECTIONS method (A. W. Bates, Gary Poole, 2003). Therefore, at this stage of the case study, an analysis based on the SECTION model will be performed, whereby will validate the usefulness of this method as another variant of identifying the best technology in the field of military science.

Each letter of the acronym for the SECTIONS method represents a component to analyze, by generating a set of questions whose answers can provide an argument. The method offers the possibility to meet the following analysis criteria with the related questions for: S = students; E = ease of use and reliability; C = cost; T = teaching and learning; I = interactivity; O = organizational issues; N = novelty and S = speed.

The essence of the method is that it is possible to identify those sets of questions by which the optimum technology can be selected through which the teaching-learning process can take place. Compared to the identified method, in order to carry out a customized analysis in the field of military sciences, we adapted the set of questions so that the answer would guide the teacher to choose an optimal method.

S = STUDENTS

Questions: What data do we have about the participants in the educational process? From what environment and military specialty do they come? In the environment from which they came, did they have access to E-learning technologies? Will they be able to access this technology again? What is the level of adaptation of the participants to this technology?

Answer: The teacher evaluates the answers to these questions, and if they are favorable, a decision will not be difficult for you to make. As a rule, the military environment offers the possibility of using similar technologies, so that the participants will adapt easily, especially if there is a training period.

E = EASE OF USE AND RELIABILITY

Questions: How accessible is it? How easy is it for participants to use this technology? Can the system's reliability be demonstrated? How friendly is the technology? How easy is it to learn and apply?

Answer: Accessibility and ease of use of technology are easily subjective criteria, they are largely dependent on each participant. The participants will go beyond the minimum accessibility threshold and will quickly acquire information on how to use them. The criterion becomes important when accessibility to technology cannot be ensured for all participants.

C = COST

Questions: What is the unit cost assigned to each participant? What is the cost of implementing the technology; What are the maintenance costs? What is the cost/benefit ratio?

Answer: The answer to this question is similar to the ACTION method.

T = TEACHING AND LEARNING

Questions: What methods are appropriate for the technology? Which technologies fit the educational requirements and objectives?

Answer: This is a criterion for which the teacher can best decide the answer, after analyzing the compatibility of the possible methods with the technology.

I = INTERACTIVITY

Questions: What is the quality of the relationship? Do the participants interact?

Answer: The degree of interactivity is evaluated by the teacher. It will not be difficult to identify the level of interactivity, in my opinion, a teacher can even contribute to this. However, in the military sciences, the interactivity of the participants is imperative.

O = ORGANIZATIONAL ISSUES

Questions: What are the institutional objectives and how does the technology influence the product? What are the limitations of technology? What does it mean to adapt to the military educational institution to technology?

Answer: This criterion can be evaluated by the teacher, but it is more of an attribute of the driving factors. It is more than certain that at the level of the management of military educational institutions the risks and solutions will be identified to overcome the limits of technology.

N = NOVELTY and S = SPEED

Questions: How new and innovative is the technology? Are the participants familiar with the technology? How soon will the new technology be accessible to participants? How fast can the courses adapt to this technology be?

Answer: Novelty is an objective criterion, but the evaluation can be subjective. A teacher can identify an objective answer. The speed of access can be easily identified. Due to the experience, the teachers will easily adapt the educational content to the new technology, consequently, the novelty and speed will be easy criteria to evaluate.

5. Conclusions

These two methods of analysis, regarding the efficient way of choosing a teaching-learning method, represent a model at the disposal of any teacher who wants to validate on well-founded criteria, a technology that will support the educational process. These variants of choosing the innovative technology will produce positive effects because it allows the realization of an analysis based on criteria established at the institutional level but also on a series of questions presented in the two previously used methods, whose answers provide a reference line regarding the choice made. Today's generations have a great advantage because they have grown with technology and accepted technological advances much easier. In this case, the use of technology represents an efficient way of experimenting, implementing and using new teaching-learning methods. Therefore, the educational process is best to take place in a classroom organized environment, otherwise, the technology can solve only part of the problem, with its advantages, and disadvantages. In the classroom, interactivity is much better utilized as opposed to its manifestation through technology in the virtual environment.

In conclusion, using innovative technology in the right context can be an excellent way to improve the student's learning experience in the military sciences, often with an advanced level of experience. Andragogy is the main approach for these specialist students. When a teacher gets to make the decision on the use of a particular technology, there is only one risk to be overwhelmed by the multitude of possibilities and the volume of available devices and software.

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