E-learning technologies, necessary but not sufficient in military sciences

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Abstract

This study aims to identify the relationship between necessity and sufficiency of innovative technologies used in the educational process of the military sciences field. The core subject of this study is that "technologies are necessary but not sufficient". As specialists in the military art, we often wonder what is the role of E-learning technology and how it influences the teaching-learning process in such a particular field. It can be considered that the emergence of new disrupted technology in e-learning may be the subject of a paradigm. Thus, using innovation in the teaching-learning process is a brave practice, but this is a double edge sword. On the one hand, there is the resilience of the system and on the other hand the opportunity of a new teaching-learning method. It can be admitted that most of the time the technologies in the e-learning field are innovative. Therefore, starting from the hypothesis that using e-learning technologies is necessary, even recommended, it is true that the e-learning technologies are not enough? To accomplish the purpose of the paper, in this approach will be used the following main research methods: the SWOT analysis and the 5 R theory by which is intended to validate the proposed thesis. The novelty of this approach consists of the fact that it uses two tools devoted to the analysis in identifying the relation between necessity and sufficiency in the case of innovative technologies used in education.

Keywords: E-Learning technologies; E-Learning methods; Military Sciences

1. Introduction

In this approach, it is proposed to identify the influence that innovative technologies have on the teaching-learning process carried out in the field of military sciences. As practitioners, but especially as theoreticians in this field, we have found the need to use consecrated or new methods, processes, techniques, and tools, adapted to the teaching-learning process. It is noticed that innovative technology, as a teaching-learning method, is the most often used in the E-learning field. Thus, the purpose of this approach is to identify the necessity and sufficiency of these innovative technologies used in the educational process, by particularizing the analysis in the field of military sciences. To accomplish the goal, it will be using the following research methods: field observation; comparative analysis; the SWOT analysis; the 5 R theory; the demonstration, and method of induction.

By and large, it can be assumed that the use of E-learning technologies, which encompasses all forms of educational technology in the teaching-learning process, is necessary, but not sufficient. "An E-learning system consists of a planned teaching-learning experience, organized by an institution that provides educational resources stored on electronic media in a sequential and logical order to be assimilated by subjects in their own way, without constraining them to group synchronous activities. The task of education and training based on new information and communication technologies is not to replace the traditional types of training, but to complete them in order to increase their efficiency." (Dobre, Iuliana, 2010)

We often wonder what the role of an E-learning technology is, what these technologies are, how it influences the teaching-learning process, how they can be used, and what are the methods of identifying the best teaching methods using these technologies. For example, E-learning

technologies include hardware (desktop, PC, tablets, electronic devices, etc.), software, media devices (mobile phones, smartphones, tablets, etc.), which can contribute to the learning process in a fun and interesting way.

To demonstrate the thesis of this study, that technologies are necessary but not sufficient, it has been set out three research objectives. Thus, the first objective of the paper is to identify the way in which the educational system accepts these technologies. The second objective is to identify the opportunity to use a new teaching-learning method. The third objective is to carry out a comparative analysis of the advantages and disadvantages of using E-learning technologies in the field of military sciences.

Let's see what are the implications of using innovative E-learning technologies in the teaching-learning process in the specific field of military sciences. Most of the time, the technologies in the E-learning field are innovative. Therefore, the analysis starts with the hypothesis that the use of E-learning technologies is necessary, even mandatory.

Moreover, this aspect represents a criterion for evaluating the teachers' performance. In the conditions in which this hypothesis is validated, the next hypothesis, it is proposed to check if the use of E-learning technologies is not sufficient. If both hypotheses are validated, it set out to identify what their correspondence is in the thesis, so that it will identify what is the relationship between the intrinsic value attributed to technology as necessary and sufficient and to technology as necessary but not sufficient. So, if it is identified a minimal difference, then the thesis is validated, thus, it can be stated that the use of innovative E-learning technologies in the military sciences is necessary, but not sufficient.

It has been noticed that at the international level there is a great concern regarding the development and use of innovative teaching-learning methods, the E-learning technologies occupy a special place in the concerns of the teaching staff of most universities. This is also a remaining concern, for which has been set the declarative purpose of this study approach: to identify the relationship and the ratio of between the necessity of E-learning technologies and the degree of sufficiency in the field of military sciences.

It is noticed that at the international level there is a great concern regarding the development and use of innovative teaching-learning methods, the E-learning technologies occupy a special place in the concerns of the teaching staff of most universities. This is also a general concern, for which was set out the declarative purpose of this approach: to identify the relationship and the ratio of between the necessity of E-learning technologies and the degree of sufficiency in the field of military sciences.

2. Innovative technology in the military sciences

As specialists in the field, many of us often faced this challenge, for which we adapted the solution to reach the didactic objectives of the discipline, by the analytical program and the discipline curricula.

Throughout our teaching career in the military art specialization, we had the opportunity to benefit from the existence of E-learning technologies and we were able to choose an innovative teaching method to respond to desired outputs.

Adaptation to these technologies was also because, alongside the classic formats of educational content, we often used presentations in certain electronic formats, which could be designed or uploaded in the virtual environment.

Uploading these presentations from the physical domain to the virtual domain, on the ADL platforms, offered by the university, where teaching-learning activities can take place, was a simple formality. In these conditions, we can adapt very easily to the advantageous conditions offered by E-learning technologies.

However, in all these cases they did not have advantages, so in this approach, the concrete advantages and disadvantages of using such innovative technologies will be identified, performing comparative analysis, from which will be underlined some relevant conclusions.

In most cases, in the discipline curricula, it can be identified lectures, seminars, laboratory work, guidance, tutoring, etc. In the particular case of the military sciences, the mandatory disciplines are military art disciplines, foreign languages, other specialized disciplines in the field and the optional disciplines are mainly specialized or related.

In the case of the military art disciplines, which occupy the largest share of the analytical program, there is a share of lectures, seminars, and laboratories, which confer on students, master, and doctoral students, specific skills in the field studied.

From a summary analysis of the possibilities of carrying out the teaching-learning process, it can be admitted that the lectures can be carried out in the online environment, using a specific ADL platform, in which the E-learning means can be used. Also, some seminars could be held in the online environment. However, if lectures, seminars, and tutoring, can be taught online, we cannot admit the same thing about the laboratory hours. The activities carried out within the laboratories are too far away from practice to identify some possibilities for their development outside the framework organized under specific conditions.

In the case of military art within the field of military sciences, the laboratory hours have a certain peculiarity, being carried out in the form of tactical applicative exercises, usually on the map, in combination with the use of simulation programs, other methods (war game, analysis, testing of courses of action, options, making decisions, evaluations, etc.) which require the presence of the whole team of students involved in the process of planning, elaboration, and evaluation of the developed products.

As we can encounter in certain situations, technology is even the teaching method, a process, or even a working tool in the didactic activity. In other words, the use of a certain technology can determine the definition of a certain teaching-learning method.

The emergence of new disrupted technology in E-learning may be the subject of a paradigm. In this situation, it can be considered that the use of innovation in the teaching-learning process is a brave practice, but it is a double edge sword. On the one hand, there is resilience (Risk intelligence: A Centre for Risk Research discussion document) of the system and on the other hand the opportunity of a new teaching-learning method. Therefore, the risk of implementing new technology with applicability in E-learning must be carefully identified and addressed.

Resilience is a term that relates to the success of an organization. Organizational resilience is the ability to quickly adapt and reorganize to unfavorable situations or changes that have occurred in the life of the organization. That is resistance to the influence of a paradigm that determines the updating and adaptation of some principles of the organization.

Is it possible for an organization, a higher education institution, a university teacher in the military sciences to admit the resilience of the organizational system under the conditions of this paradigm?

To get an answer, the research will lean on an analysis based on a theoretical model launched by the international organization AIRMIC (Association of Risk Managers and Insurance in Industry and Trade) (https://www.airmic.com/), the 5 R theory (https://www.airmic.com/technical/library/roads-revolution-executive-summary), which even though it was launched in 1999 (Cannon, T., 1999), is still topical.

The 5 R theory uses the following analysis criteria: *Risk Radar; Resources and Assets; Relationships and Networks; Rapid Response; Review and Adapt*.

3. The 5 R theory; Aligning Resilience with Digital Transformation

By this theory, it can be identified the particular approach of the digital domain, which presents 8 principles (Roads to Revolution - executive summary, 2018) regarding the achievement of resilience under the conditions of digital transformation, that is to say, the emergence of those innovative technologies.

Given these 8 principles (risk radar; resources, relationships, rapid response, review and adapt, redesign, retain stakeholders, and reinvent purpose), it can be seen that the first five principles underpin the 5R Theory model.

Essentially, this theory allows to identify the risk, the resources, the relationships, the response, the way of adaptation, identify those solutions of resilience and transformation into 5 points:

a. *Risk rada*r identifies the trends and the evolution of the technology that offers the organization opportunities to improve the teaching-learning activity - Emerging Risks. Thus, from the point of view of radar risk, the emergence of a new E-learning technology improves the teaching-learning activity. The teacher has an important role, in this case being a promotional vector.

b. *Resources and assets* provide the opportunity to fully benefit from the evolution of technology- Strengthen Resources. From the point of view of Resources and assets, the adoption of a new E-learning technology enriches the educational resource. Any acquisition that brings benefits must be encouraged.

c. *Relationships and networks* refer to that partnerships are a way of realizing the transformative capabilities of the educational organization - Extend Networks. Within the educational organization, relationships and networks can be applied through partnerships, consortia, and joint projects. This attribute belongs to the management factors and must be one of the institutional objectives.

d. *Rapid Response* - allows the educational organization to accept the transformations and to adapt. For example, inter-institutional cooperation and adaptation allow clear identification of roles and responsibilities within the educational organization or a consortium -Remove Barriers. The adaptability of the educational organization, by applying the Rapid Response principle, requires the acceptance of the new, the adaptation to it, its application, but without affecting the image of the institution. Also, this principle must be an instrument of the driving factors and must be one of the institutional objectives.

e. *Review and Adapt* represents the ability of educational organizations to protect, review, and adapt the organization's reputation through leadership -Enhance Reputation. In the case of increasing the reputation of the organization, the principle of Review and adapt applies only in the sense of contributing to the growth of confidence. In this regard, the leadership of the organization plays an important role.

As a result of this analysis, the organizational resilience in the educational field can be overcome by the attitude of the teacher, the collective attitude, the acceptance of the new, and the adaptation of the new technologies to the needs of the organization.

Given these findings following the analysis of how to adapt the educational organization, by accepting resilience, it can be considered that attitude is the key. Thus, no principle could be forced to be applied and the educational organization is able to easily accept the adoption of new E-learning technologies.

It has been basically identified the solutions for each criterion of 5R theory so that the organization can overcome its resilience to the emergence of those innovative technologies.

Because it has been demonstrated the need for technology, it has been validated as the first hypothesis. Next, it will be demonstrated that the technology is not enough to validate the second hypothesis of this approach.

It has been identified the solutions for each criterion of 5R theory so that the organization can overcome its resilience to the emergence of those innovative technologies.

So far, it has been demonstrated that the need for technology validates the first hypothesis. Next, the scope of this pilot study is to demonstrate that the technology is not good enough, which conduct to the validation of the second hypothesis.

4. Is the innovative e-learning technology necessary and sufficient?

In order to find out the answer, it will be identified the relationship between the intrinsic value attributed to the technology as necessary and sufficient and to the technology as necessary, but not sufficient.

R = technology required but not sufficient / technology required and sufficient

In order to find out the value of this report, it will be assigned an intrinsic value to the two components (the necessary and sufficient technology and the necessary but not sufficient technology).

so,

- technology required and sufficient = a; - technology required but not sufficient = b

If this ratio is balanced (see formula 1):

[1] $R = b / a = 1$,

then, the hypothesis that the use of *E-learning* technologies is not sufficient is not validated.

Because if $a = b$, ($x = 0$), $R = 1$, the technology is necessary and sufficient.

In order to validate the hypothesis, it can be considered that if a technology is not sufficient, it needs certain factors that complement the need to be sufficient.

so,

[2] $a = b + x$,

where,

- x represents that variable that is assigned a minimum threshold for which technology is sufficient. That is, x represents the sum of factors that have a certain weight in this equation.

In this case, it is obvious that $a > b$, so,

[3] $F(x) = b / a \neq 1$,

Thus, the hypothesis is validated, one technology is not enough, it still needs certain factors to complete it to become sufficient.

5. SWOT analysys

Next, let's see what are the factors which determine the necessary but insufficient character of technology. It is obvious that some factors are beneficial (positive) and some are unbeneficial (negative). For this, it will be analyzed these factors, which can be identified among the advantages and disadvantages of using these innovative technologies. In this regard, it will be performed a SWOT analysis.

At first glance, SWOT analysis comes up with a series of advantages, disadvantages, opportunities, and threats to the implementation of innovative technologies. Therefore, it can easily be identified what are those particular advantages and disadvantages in the field of military sciences.

The result of the analysis confirms that the use of innovative technologies presents a number of advantages and disadvantages, which are factors that argue the necessity of using certain technologies, but diminishes their sufficient character.

The SWOT analysis shows that technology is necessary but not sufficient, and it draws to this conclusion that innovative technologies should not have disadvantages and, if present, they must be minimal and not negatively influence the educational process.

SWOT analysis

	Beneficial to use innovative technology	**Endanger the use of innovative technology**
Internal source	Strengths of using innovative technologies	Weaknesses of using innovative technologies
	-the teaching-learning process is attractive and interesting; -it increases the motivation of the participants; -it increases the interest of the participants; -increase the availability of participants; -allows participants to practice the skills learned in a virtual environment; -contributes to strengthening the interactions between the participants; -gives participants more options for expression; -allows the objective evaluation of the participant; -immediate feedback; -permanent evaluation and adaptation to needs; -it identifies new skills; -flexibility; dynamism; -quantifiable activity; -certain teaching-learning methods can be easily selected; -identification of individual skills; -development of individual skills.	- it can be incorrectly implemented; - the degree of attention of the participants cannot be controlled; - not all the teaching objectives can be achieved; - accessibility may be limited; - the participants' experience of using new technologies is different; - the degree of satisfaction differs from one participant to another; - the costs of technology can be high; - could occur technical errors; - human errors may occur; - the prejudices of the participants are manifested; - the interaction is sometimes affected by social distance; - decreased empathy; - the degree of physical and social isolation increases; - some teaching-learning methods cannot be used; - prioritize the tradition of classical education; - variations in individual availability; - the level of classification of information; - does not stimulate critical thinking; - automation of actions; - lowering the perception of reality; - group skills cannot be used; - affected teamwork.
External source	OPPORTUNITIES	THREATS
	-the possibility of developing educational programs; -the possibility of accessing the structural funds; -openness in inter institutional relations; -attracting new beneficiaries and target groups; -increasing institutional confidence; -development of group availability; -developing receptivity; -increase the efficiency of the educational process; -the effectiveness of the educational	- deterioration of social relations; - low level of social empathy; - lack of physical interactions; - insufficient financial resources; - maintaining the mentality; - risk of falling institutional interest - the intensity of learning decreases over time; - tasks become a constant pressure; - social prejudices; - becomes discriminatory for certain areas; - lack of cooperation; - the appearance of biases; - the decrease in participation;

	process is easily identified; -it contributes to the increase of educational performance; -increasing the quality of teacher performance; -development of the ADL platform; -partnerships with other educational institutions; -capitalization of heuristics; -development of innovation; -identification of working skills in projects.	- increases confidence in technology and decreases confidence in the teacher; - decrease the availability of beneficiaries; - depreciation of the real reality; - the impossibility of developing group skills.

Table 1. SWOT ANALYSIS

6. Conclusions

Due to the advantages/disadvantages ratio, resulted from the SWOT analysis, innovative technologies offer opportunities but also limitations. More than that, technology offers both, advantages and disadvantages to the education system.

It has been previously emphasized that in the case of using innovative technologies in education, the attitude of the participants is the key to success. How can we cope with this paradigm in the field of military science?

The tradition and educational culture of an organization is difficult to influence. In military art, only the most revolutionary decisions have changed the course of history. In the 21st century, there is an optimum degree of acceptance of innovative technologies within the military organizations, which represent the main beneficiaries of the products in the field of military sciences.

Therefore, the acceptance of technological innovations in education is prudent. Over time, working tools were accepted in the educational field, but these were based on the need for education in accordance with the working conditions existing to the beneficiaries. (simulators, polygons, etc.)

The result of the analysis confirms that the teaching-learning process is more than innovative technology. As specialists in the military art, the authors would like to mention that technology is necessary, but not sufficient for the teaching-learning process.

It is generally known that the specialists in the field agree that in the teaching-learning process the technology is not sufficient, but only complementary, emphasizing the role of the teacher and the school, a conclusion being presented as before.

When we talk about innovative E-learning technology in the field of military science, we approach the most developed, the newest technology, which will allow me to reach the most objectives and acquire sufficient capabilities to meet the student officer's expectancy, with a degree high efficiency. In these conditions, for teachers, the effort to complete the difference between using or not using innovative E-learning technology is minimal, so that the achievement of the proposed performances can be achieved by the classical methods known.

In order to have a performant educational system, the use of E-learning technologies in education in general, and in the military sciences in particular, is imperative and needs a strategy. Neither an innovative technology cannot compensate for a weak teaching act, nor a modern teaching method can ignore an innovative technology.

Even repeating what is obvious, the teaching-learning process needs more than innovative technology. Performance education cannot be done without followings aspects:

- the active participation of students;

- the existence of conforming educational contents;
- the application of appropriate methods;
- the use of appropriate tools;
- the existence of an educational organizational framework conducive to a combined education, factors that are essential for modern education.

The optimization of the percentage of these factors leads to the consolidation of the b/a ratio which can tend to the value 1 so that the intervention of the teacher is minimal but not minimized.

Due to the fact that it has been validated the hypotheses proposed with the help of the specific research methods and by fulfilling the proposed objectives, the purpose of this approach has been met, so the thesis proposed in this study is confirmed, in military sciences, *E-learning* technologies are necessary but not sufficient!

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