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Land Forces Academy Review
Vol. XXVIII, No. 2(110), 2023

A MAPPING OF THE DESIGN OF EDUCATIONAL PROCESSES BASED ON THE USE OF COMPUTER-BASED TOOLS IN HIGHER MILITARY EDUCATION

Alina Elena IONAȘCU (HULUBA)
"Carol I" National Defense University, Bucharest, Romania
ionascualinaelena@yahoo.com

Andra-Ioana PÎNZARIU
"Nicolae Bălcescu" Land Forces Academy, Sibiu, Romania
andra.pinzariu21@gmail.com

ABSTRACT

Increasing the technological progress in society and the impact of digitization on educational processes, especially in the wake of the COVID-19 pandemic, has given rise to new challenges for higher education, including the military academia. This study explored approaches to the integration of technologies in higher education and mapped the specifics of educational processes based on the use of computer-based tools in the preparation of military students for becoming officers in the Romanian Armed Forces. To carry out this investigative approach, we used a qualitative research methodology that included a comprehensive analysis of international literature and national studies, and a screening of the environment within the Romanian higher military education system. The findings of the interpretive research highlight the trends in technology-based educational approaches and generate meanings regarding the characteristics of technology integration in the national higher military education system.

KEYWORDS: computer-based tools, higher military education, educational processes

1. Introduction

In the context of technological developments and of the urgent need to shift to conducting educational processes using computer-based tools, higher education institutions, including those in the military education system, are concerned with finding the best way towards the successful integration of technologies. In addition, for military institutions, this time of persistent conflict has led to focusing the personnel training strategies towards student-centred learning/education and training, appreciating its importance in forming "high-quality" human resources. This key aspect to the research focus on educational processes is supported by more recent work on the education of military officers that argues for the ongoing relevance of the professional soldier (Nielsen & Liebert, 2020), who is capable of understanding the military valences of international security affairs and responding to their challenges in a timely manner.

DOI: 10.2478/raft-2023-0014
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Despite the fact that the serious games have already been used to prepare the armed forces for participation in military action, the integration of computer-based tools such as videoconferencing platforms, e-learning applications, tutorials, blogs, etc. into academic training has received particular interest in recent years.

Taking these aspects into consideration, the aim of this paper is to provide an overview of the approach to the design education processes based on computer-based tools within military higher education institutions from the perspective of institutional, organisational and administrative factors. Thus, the study will further complete the investigation of key issues related to the continuous transformation of technology-based educational processes in the military and in the civilian academic community. This line of action is in accordance with the recommendations of Martin, (2020), resulting from a meta-analysis of online teaching and learning from 2009 to 2018, which shows that management and organisational factors are the least studied topic, and that the management of online learning and policy development for online education need more research. In addition, it complements the findings reported by Scoppio and Covell (2016) on the need for an increased concern of the Canadian Armed Forces' higher education institutions along the lines of organizational accountability, implementation of standards of practice, and additional training in addressing technology-based pedagogies, with the results of the analysis of the context of the higher military education in Romania.

As such, the present study is in line with the current concerns of the civilian and military academic communities, which are interested in investigating the best ways to use information technologies in educational processes, distinguishing itself by focusing on the subject of the design of higher military education of the Romanian Armed Forces. The research is based on organisational, institutional and organizational factors.

2. Brief Literature Review: Perspectives of International Academia and Higher Military Education in Romania

This brief review examines some of the most relevant studies on the significance of higher education institutions' approaches to integrating technology into teaching and learning processes. Given that the systematic development of technology integration capabilities in universities is a significant indicator of added value in the market of education providers, especially in the context generated by the COVID-19 pandemic, the strategic approach that universities have when it comes to this challenge is a point of interest for researchers and leaders in the field. In this context, Romanian military higher education institutions have joined the new trends, and the process of integrating technologies in military education is visibly accelerated in the wake of the COVID-19 pandemic, which imposed the design of approaches for the implementation of educational activities in online or hybrid format.

Consequently, this paper addresses this issue from the perspective of methodological and procedural design elements that facilitate the development of educational processes based on the use of information technologies, within the military higher education institutions of the Romanian Armed Forces.

Conceptually, in this paper we use the term "educational processes based on the use of computer-based tools" to refer to specific teaching-learning-assessment activities in completely online or hybrid learning environments whose aim is to prepare military personnel in a broad

spectrum of undergraduate and postgraduate programs to understand Janowitz's (1960) security affairs and to perform in environments scarred by uncertainty. In a broad sense, we adhere to Graham's (2006) conceptualization that blending learning is *"a combination of face-to-face and computer-mediated training"*. In a narrow sense, we refer to the proportional paradigm advocated by several authors, whose view assumes that a hybrid learning environment implies that 30-79% of the delivery of instructional content is online, with the difference being represented by face-to-face exposure (Allen, Seaman, & Garrett, 2007; Uwes, Basuki, & Zulfiati, 2018) From a practical point of view, we refer to learning environments technically supported by technology to blend traditional teaching and synchronous and/or asynchronous distance learning methods (Feitosa de Moura, Souza, Noronha, & Backx, 2021).

The selected procedural and methodological design elements are included in the C þ model proposed by Sailer, Schultz-Pernice, & Fischer (2021), in order to analyze contextual enablers of learning activities involving technology (CFLAT) in higher education. Due to limited access to relevant resources, this paper focuses only on elements related to institutional, organizational, and administrative factors, considered in the model as distal contextual facilitators, including digital equipment, categorized as having a moderating role. According to the description of this model, the institutional, organizational and administrative factors involve infrastructure, equipment or support structures and a digitization policy, including development, which indicate the boundaries for the actual realisation of educational processes based on computer-based tools. In support of this methodological choice, the study conducted by Lohr et al. (2021) highlights the significant role of the strategy of the university on the variability of the degree of staff engagement involved. It implies grounding institutional approaches on providing technical-educational support and improving institutional infrastructure, which creates possibilities for a wider scope of digital learning activities. In addition, the study carried out by Dhawan (2020) highlighted that the digitization of the educational processes specific to the academic environment implies increasing the quality of online teaching-learning-assessment activities.

In the local literature, we have identified two extensive studies that have dealt with the investigation of education involving the use of technologies in higher education during the pandemic and whose results suggest, among others, the need to adapt educational policies to the needs of teachers and students (Dascălu, et al., 2021; Roman & Plopeanu, 2021).

In the context of Romanian military higher education, the main themes debated in the scientific approaches refer to the barriers that military academies had to overcome at the time of the urgent need to digitize education in the context of the pandemic (Miron & Gherman, 2022; Meclea, Găină, & Boşcoianu, 2022), and to the exploration of experiences related to the use of platforms such as Moodle (Petrişor & Petrişor, 2021). In this regard, we start from the assumption that the methodological and procedural elements included in the documents analyzed can create a broad picture of how the leadership of military higher education institutions has responded to the urgent need to transform educational processes for online or hybrid environments.

Therefore, it is important to examine the design of educational processes carried out in online or blended format in order to get an overview of how institutional reporting in terms of infrastructure, technical-educational support, digitization and development policies can ensure better

teaching-learning experiences. Pituch & Lee (2006) have noticed that the functionality of the learning management system that ensures the delivery of technology-based educational processes can significantly affect students' success. In addition, the influence of the level of internet access on students' learning experiences is noted as well (Anderson, 2004).

Bearing these aspects in mind, it is important to examine how military academies have dealt with the challenge of digitizing educational processes with reference to: procedures and policies designed in line with the provision of infrastructure (e-learning platforms, technology endowments, internet access, the possibilities of the technological tools used): providing the necessary support for its use; prospects for technological development. This can be summarized by the following fundamental research question: How have the military academies of the Romanian Armed Forces designed their teaching-learning-evaluation processes in online or hybrid environments? In addition, we argue that the set of characteristics identified in this study will provide a new perspective on the design approach to the conduct of educational processes using computer-based tools, due to the proposed investigative perspective.

3. Research Methodology

This research summarizes a qualitative case study conducted as part of a doctoral research program in which the authors explore how computer-based tools are used in the higher education system, particularly in the context of military education at university level in Romania.

Through the present research, we aimed at exploring how military higher education institutions have methodologically grounded their educational processes using computer-based tools, especially during the COVID-19 pandemic. Thus, we seek to produce a mapping that provides information on the concepts and procedures addressed by these organizations to shift to the conduct of the teaching-learning-assessment and research processes with the help of technologies, in order to find the solutions of these academic communities and formulate solutions to consolidate ideas and experiences, based on relevant literature in the field.

While exploring this research theme, the study was carried out in two stages. The first one consisted of conducting a succinct literature review of the use of computer-based tools in educational processes, an issue more commonly known under the umbrella term of "blended learning", which involves a combination of online and face-to-face educational processes delivered using technologies (Singh, 2013). For this purpose, the information searching strategy was based on the Campbell method guide (Kugley et al., 2017) for systematic reviews. We set keywords, including their English equivalents, to identify scholarly works that matched the research interests, among which we include: "higher education and technologies, learning through technologies, trends in academic education during the pandemic". A comprehensive database of literature emerged, from which we chose to briefly prioritize the results that highlight approaches from the organizational perspective and findings strictly related to the specific military academic context in Romania, focusing on the perspectives of authors who presented their approaches in articles and scientific communications in the military field. In order to frame the research within the specific limits of scientific communications of this type, we sought an answer to the question: what do we know about the use of computer-based tools in the context of Romanian higher military education in the last three years, in relation to the body of international literature on the successful implementation of learning with technologies?

Starting from the trends and patterns found in the review of scientific sources, we proceeded to the second stage of the study: the analysis of documents regarding the conduct of online teaching activities by national military academies, published on their websites, in accordance with Law 544/2011 on free access to information of public interest. For this purpose, we explored the websites that are free for publication and selected the documents related to the way in which five military higher education institutions from Romania decided to conduct their educational processes in online or mixed format: "Carol I" National Defense University (CNDU), "Nicolae Bălcescu" Land Forces Academy (NBLFA), "Ferdinand I" Military Technical Academy (FTMA), "Henri Coandă" Air Forces Academy (HCAFA) and "Mircea cel Bătrân" Naval Forces Academy (MBNFA). The content and comparative analyses of the documents were used to identify the valences of the approach to military education based on the use of information technologies, answering to the following questions:

a) what evidence of integration of IT tools can be found in the documents on the online conduct of educational activities?

b) what IT tools and approaches to delivering online education are used to determine academic performance?

4. Results and Discussions

By scanning the websites, we identified the documents prepared by universities that include details on how to carry out online activities during the pandemic, in line with the National Education Law, the Decree of the President of Romania no. 195/15.03.2020 on the establishment of the state of emergency on the territory of Romania and the Order of the Minister of Education and Research no. 4020, dated 07.04.2020, on the derogation from the legal provisions in the field of higher education during the state of emergency on the Romanian territory. In general, the methodologies, procedures and plans revealed information on the use of online learning management systems, how teaching and evaluation of academic programs are carried out with the help of online platforms, and the existence of digitization policies under implementation using European funding programs. However, there was less information on the provision of technical-educational support and the role of continuous development of technologies in order to exploit them to their full potential for the entire spectrum of their stated institutional missions. For specific security reasons, we consider that there is a high probability that such information will be included in documents accessible only to people within the institutions.

For the purpose of this article, we briefly address each element. We therefore focus on the most relevant findings for higher education in general and military academia in particular.

Regarding the institutional infrastructure, we have identified two distinct approaches to delivering educational processes in online or hybrid format. The first approach focuses on merging the technological possibilities offered by several tools, such as the use of the Moodle platform with the facilities offered by the Big Blue Button integration (NBLFA, 2020) or those made available by Microsoft Teams (HCAFA, 2020; FTMA, 2020). The second approach relies on carrying out educational processes using the possibilities offered by a single tool such as ILIAS (CNDU, 2020; CNDU, 2020) or Advanced Distributive Learning (ADL) (MBNFA, 2020).

Another key aspect that we have identified is the use of constructive-interactive learning techniques and methods (individual/team projects, questions asked during videoconferencing sessions to assess level of understanding) in the evalution process, with no specifics on this for the

teaching activity found in the documents analyzed. Instead, we found little evidence of technology and internet access in classrooms. We can suggest that this shortage can be attributed either to their existence without the need for stipulation in procedural documents, or to a reluctance to change for reasons of insufficient equipment, restrictions imposed by the need to ensure the security of the teaching staff. In this regard, we believe that quantitative methods of data collection or a research design based on the use of participatory observation would shed some light. However, the extent to which the necessary consent to conduct such studies can be obtained cannot be predicted, given the doctrinal and security issues specific to the military.

The technical support is provided for teachers and students through guides made available to them anytime, anywhere. However, the overall analysis reflects a modest design approach to educational support. We did not identify any guides or other institutional leverage used to support teacher training in adapting pedagogical activities to the online or blended learning environment.

Therefore, from the perspective of computer-based tools, the results of this qualitative study indicate a heterogeneous picture of the design of educational processes carried out in online or hybrid format. In the design and implementation of online or hybrid learning, the literature reviewed clearly shows that the specifics of the technologies used can affect the achievement of the objectives. Universities should pay attention to the extent to which the technological possibilities used facilitate teacher-student interaction and learning outcomes. From the perspective of technical and educational support, the landscape is homogeneous. Design and implementation are supported by detailed technical guidelines, but not by educational instructions that would ensure the best match between the technology used, the pedagogical approach and the learning outcomes.

Lastly, the digitization policy is integrated into the operational plans and its directions of action reflect the main missions of military higher education institutions. As a result, in terms of educational and research processes, the management of the institutions aims to implement systems for managing the students, library and diploma projects, to develop a database of research results and to expand training platforms. On the administrative side, the main objectives are to equip the institution with high-performance technological devices, to extend the WiFi network and to increase the availability of the communication network.

5. Conclusions

This article has briefly described the characteristics of the design of educational processes with the help of computerized tools, within military higher education institutions of the Romanian Armed Forces, in a mapping picture that reveals the specificity of institutional factors, whose aim is to maintain an interconnection relationship between technology, users and the objectives to be achieved. The analysis focuses on, but is not limited to, the military academic environment and the findings can be investigated at the level of higher education.

We note that the extent to which the design and adoption of a unified set of IT tools across all military higher education institutions can contribute to the development of the system, given the background of key factors such as: effectiveness of inter-institutional partnerships, identification of weaknesses and exploitation of potential through a homogeneous communication and collaboration network, minimization of administration efforts, etc. remains open to further investigation.

Moreover, we believe that pedagogical approaches need to be anchored in the facilities of information tools in order to provide real opportunities

to achieve the goal of "student-centred learning". In this sense, one of the major challenges is to design protective strategies towards teachers and students, whose ultimate goal is to move from their reluctance to transform traditional teaching-learning methods to their easy adaptation through technological facilities. Promoting practical methods of interaction between pedagogical approaches and the possibilities offered by computerized tools, focusing on the benefits for learning, could be a first institutional leverage to facilitate the smooth integration of technologies.

Although the analysis of the data sources identified by scanning the websites of the Romanian military higher education institutions provides a mapping picture of how educational processes were designed and carried out with the help of computerized tools, our findings are constrained by the specific limitations of qualitative approaches and those related to the importance of classifying information in the military field. Even though the overview provided is supported by a robust methodology, it only reflects the findings of the analysis of documents made available to the public, from the perspective of institutional factors, lacking references to facilitators such as student characteristics, which require quantitative and experimental research projects.

Ultimately, we hope that our findings and proposals will give rise to interest in further research on this matter.

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