

INFORMATION-COMMUNICATION SIGNIFICANCE OF DIGITAL TEACHING MATERIALS IN E-EDUCATION

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Abstract

Due to powerful technological development, information is more accessible to everyone today and communication is more intensive, but often not more meaningful, both in everyday situations and in the process of learning and teaching. This paper deals with the role of new technologies in that process, its importance in the creation, development and application of DTM (Digital Teaching Materials), as well as the advantages and disadvantages seen through the communication aspects of a wide range of teaching cadets in the field of military training. In addition to the previously presented problem, research questions were asked: How do modern technologies affect the process of teaching cadets? Did they distance the cadets from its essence or did they bring it closer to the process of acquiring knowledge and skills? What role do digital teaching materials play in this process? How important is it for the e-learning process and the quality of learning outcomes? The research in which 498 cadets of military schools in the Republic of Croatia participated was conducted using a survey questionnaire. The analysis of the results indicates a high perceptual role of digital teaching materials, which is evident from the attitudes of cadets, and which significantly correlates with their satisfaction related to the associated communication aspect of e-learning. Furthermore, the discussion of the results is aimed at explaining the significance and description of DTM information constructs by classifying which enables to determine the intensity of significance and legality between information objects of learning outcomes, thus making a contribution to the field of information and communication sciences, however, the paper also emphasizes initiatives for interdisciplinary research whereas in the focus are new technologies in teaching and learning.

Keywords: Information, communication, e-education, digital teaching materials, cadets.

1 INTRODUCTION

Lifelong learning is faced with various challenges for new learning that is implemented through certain issues of e-learning. An important challenge is a feature in the modern revolutionary development of information and communication technologies (ICT). For this reason, only the education of cadets and military personnel should be specially adapted to the requirements of military and technological development, which is rapidly reflected through the processes of e-learning, more precisely e-learning. This learning process is extremely important in the human resource management process. For the best possible advantage in learning, it is extremely important to properly develop work throughout lifelong learning, that is, you need to constantly educate and improve competencies. In this kind of work, only LMS represents a good approach for the best and most flexible, but also cost-effective building of competencies. Mostly for the reason that such learning can be applied without a set restriction, that is, whether we conduct it at home or at work [1]. Over time, there has been great scientific interest in the issue of e-learning, which has proven to be a development trend in education.

The importance of investing in education can be reduced to several reasons. One of the biggest is certainly a large number of changes in technology where knowledge becomes obsolete and thus automatically reproduces the desire for new knowledge and the highest quality education [2]. Such changes are followed by changes due to the increasing complexity and uncertainty of the environment itself, which requires and requires even greater and new knowledge from cadets, as well as a different application of knowledge. In that way, cadets are put in the foreground, as well as their development in the organization. In light of the projection of a vision and strategy that contributes to social and economic development, distance learning is today one of the fastest growing areas of education and training. The distance learning mission includes larger dimensions of openness and flexibility, whether in terms of approach, curriculum or other structural elements. Therefore, good communication skills, conflict management skills are important, but also new forms of effectiveness, although the requirements of modern military organization and management are increasing and demanding. Therefore, this paper aims to explain the concepts and definitions of distance learning and digital teaching materials by pointing out their advantages and disadvantages, accompanying technologies,

methods and implementations in military schools. The paper will also provide recommendations and future research. It is intended for all educational institutions that provide distance learning, institutions that will provide distance learning in the future and their academic staff.

Learning Management Systems (LMS) are applications that serve as intermediaries in the e-learning process. LMS is most often an Internet application designed as a set of standardized components for learning and is connected to the existing information system of the organization that uses it (school, company, state, etc.). The purpose of LMS is to use existing resources to provide the highest quality and best learning environment for both the course leader and the course participant [3]. The organization and implementation of the learning process is changing completely due to major technological changes such as rich streaming media, broadband internet access and more advanced website design [4]. By definition, LMS systems are actually a set of integrated web-based learning management tools [5]. As changes in learning occur in military schools in the Republic of Croatia, so does modern technology, which enables greater savings and the quality of the learning experience. According to Zapati some of these criteria are that it allows professors and students to access the system from anywhere and at any time by accessing the internet [6]. The general use of modern technologies for this purpose can be divided into four categories, including: printing, audio (voice), computer (data) and video. The World Wide Web can be described as learning that involves implementing the application of information, computer, and communication technologies in more than one place [7]. In this way, online links allow students wider access to educational material [8].

E-learning certainly has many advantages that highlight significant changes in learning processes [9]. In the Republic of Croatia, there are several other software tools that are based on the Moodle system, among which the most prominent is Merlin. LMS - Merlin is an e-learning system based on the Moodle e-learning system that the University Computing Center (Srce) has adapted to the university community of the Republic of Croatia, which includes university military studies. It is being developed and maintained at the Center for e-learning of the University Computing Center (Srce) in Zagreb as a common, accessible platform for e-learning projects in university teaching.

All modern technologies used in the education process necessarily have their pros and cons. The same happens with the use of the Merlin system in teaching. The biggest advantages of e-learning are its wide availability, simplicity and efficient use of time [10]. E-learning via the Internet enables a particularly dynamic interaction between teachers and students, as well as students with each other [11]. According to research in university military studies, there are advantages and disadvantages to using the Merlin system in teaching. One of the most important advantages of the Merlin system is that it encourages cooperation and interaction between cadets, but also cooperation between professors and cadets. Each individual contributes to the teaching by initiating or participating in discussions (forum, chat) related to the topic, and it is important to be able to adapt the teaching to suit each user. Furthermore, withdrawn and shy students, and those who have a fear of speaking in front of an audience with e-learning can progress very well, can participate when and for how long they want in a discussion, and it is known from before that every voice will be heard within a discussion [12]. On the other hand, shortcomings such as insufficient IT literacy of cadets and professors can be a big problem when using the Merlin system. Sometimes organizing courses and the many opportunities that Merlin provides require a great deal of IT knowledge from users, which some users do not have. Although Merlin has good customer support, if information and communication problems occur, reporting them sometimes requires a lot of time and patience, so customers often give up.

Activities through digital teaching materials (DTM) in Merlin can be performed synchronously (simultaneously, ie at the same time or within a shorter time interval) and asynchronously (at different times, ie without defined short target time intervals). Asynchronous e-learning allows cadets to participate in communication and learning at a pace that suits them, without the simultaneous presence of a professor. University military studies are increasingly moving towards the use of the Internet for the purpose of distance learning emphasizing the academic year 2019/2020 winter semester where all distance learning was conducted via the Merlin and DTM systems during Covid-19. DTM digital teaching materials can be constantly updated or supplemented with new information, and users are aware of all these changes at the same time and can see them at any time. When users can access the Internet and use DTM digital teaching materials, it is easier for the professors themselves because they can refer them to the relevant information according to their needs.

When comparing e-learning with traditional teaching, it is concluded that it has greater advantages [13]. There are various definitions of learning and acquiring skills, knowledge, abilities, attitudes and habits - competencies. The prevailing theoretical paradigms and approaches to learning greatly contribute to the increase of the information concept of literacy in learning processes [14]. All of them

require greater involvement of cadets, but also greater influence of information sources in educational processes. Learning is defined as: "the acquisition of skills and knowledge that result in a relatively permanent change in behavior, while education means the expansion of overall knowledge, knowledge, skills and abilities of a person that enables him to make independent decisions and act in different situations."

When we talk about the resources needed to use DTM in teaching, it is necessary to provide exactly those elements that will help to overcome these problems. Teachers should be provided with appropriate support both in technological terms (availability and knowledge of the use of LMS) and in methodological terms (knowledge of teaching methods and procedures that enable quality application of LMS Merlin in teaching). Digital teaching materials are electronic contents on an electronic medium or displayed on the Internet intended for use in education and independent learning. Regarding the availability of LMS-Merlin in university military studies, teachers often unjustifiably think that they cannot introduce DTM in teaching because the study is not sufficiently equipped with technology. But it is wrong to think that DTM will be able to be introduced in teaching only if there is a computer classroom where cadets work on their own computers connected to a high-speed Internet connection, then powerful computers or laptops for teachers and cadets, a smart board. To introduce DTM in teaching such as multimedia PowerPoint presentations, a minimum LMS is enough: a computer with a projector, and it is desirable that it be connected to the Internet. Furthermore, it is necessary to continue educating teachers for its use, and especially for the use of those tools that will allow easy creation of DTM. Therefore, in addition to courses on the application of LMS - Merlin, it is important to provide teachers with appropriate education in the methodology of e-education through courses and other forms of professional development in this area. A teacher who is well trained in the use of LMS and methodology will also be able to independently create a DTM for their cadets. In the beginning, it will be necessary to spend some time which is longer than in the preparation of traditional classes, but the effort will pay off because for the next generations of cadets, by reusing the created DTM, the preparation will be reduced. The award will certainly be more motivated and active cadets who will more easily achieve the set learning outcomes.

2 METHODOLOGY

Research in which one wants to present one's views on a certain topic is most often used by interview methods or surveys. This research used a survey method in which 498 cadets of military schools in the Republic of Croatia participated.

The main goal of this research was to show the attitudes of cadets of military schools in the Republic of Croatia towards the use of digital teaching materials in teaching and to gain insight into how often cadets use DTM in teaching.

The following research hypotheses are set

- H1: Military school cadets have a positive attitude towards DTM.
- H2: Military school cadets know DTM.
- H3: Military school cadets do not often use DTM in teaching.

The analysis of the results indicates a high perceptual role of digital teaching materials, which is evident from the attitudes of cadets, and which significantly correlates with their satisfaction related to the associated communication aspect of e-learning.

3 RESULTS

3.1 Use of digital teaching materials DTM

This questionnaire consists of five questions that sought to gain insight into whether the digital teaching materials contributed to a more relaxed but at the same time working atmosphere of the cadets at the lecture.? Do they see the purpose of using digital content in teaching and their connection to examples from everyday life? Did they assess that they had mastered the material in the classroom in which digital educational materials were used? Are they more active than usual when attending a lecture where DNM is used? Is DNM often used in teaching in university military studies?

The first question was intended to insight into the cadets' familiarity with the DTM, which contributes to a more relaxed but at the same time positive working atmosphere at the lecture.

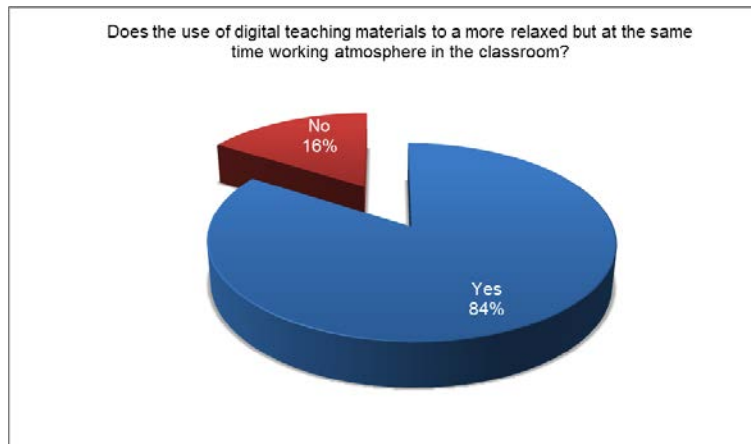


Figure 1. Use of digital teaching materials.

As can be seen from Figure 1, most respondents 84% answered that the use of digital teaching content contributes to a more relaxed but at the same time working atmosphere in the lecture, while 16% of respondents point out that it does not contribute to a more relaxed working atmosphere.

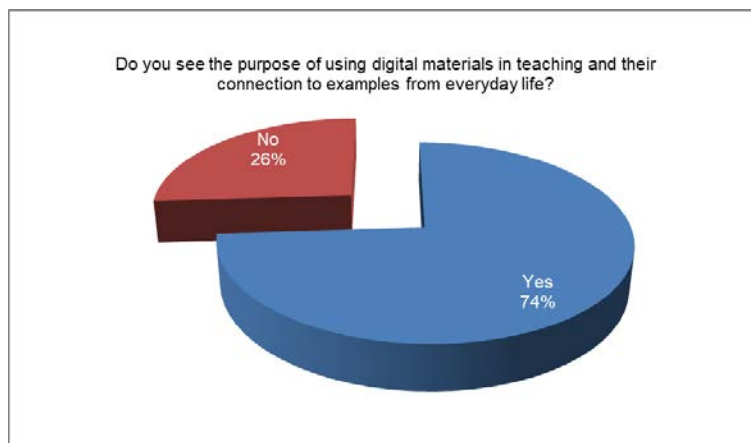


Figure 2. Connection with everyday life.

In Figure 2, the majority of respondents, or 74%, point out that they see the purpose of using digital content in teaching and their connection with examples from everyday life, while 26% of respondents point out that they do not see the purpose of using DNM.

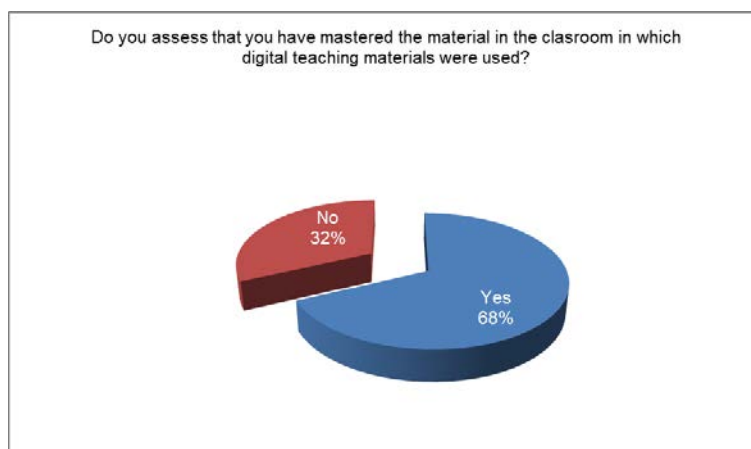


Figure 3. Mastering the material with DTM

Furthermore, it can be seen from Figure 3, the majority of respondents 68% assessed that they mastered the material in teaching in which digital educational content was used, while 32% of respondents estimated that they did not master the material in teaching where digital educational content was used.

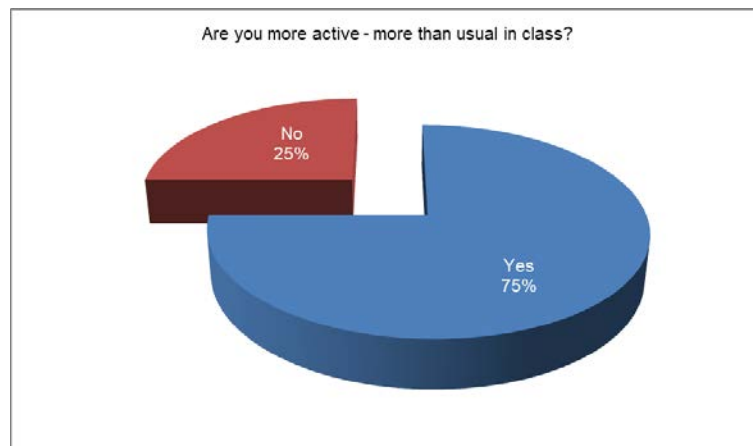


Figure 4. Student activity in class

In Figure 4, the majority of respondents, i.e. 75%, point out that they are more active than usual when they participate in a lecture where DNM is used, while 25% of respondents point out that they are not more active than usual where DNM is used.

The frequency of the use of DNM digital teaching materials in teaching in university military studies is one of the key issues for gaining insight into the attitudes of cadets. Thus, the following question sought to show the situation of cadets in teaching at university military studies. How often are DNMs used in teaching in university military studies?

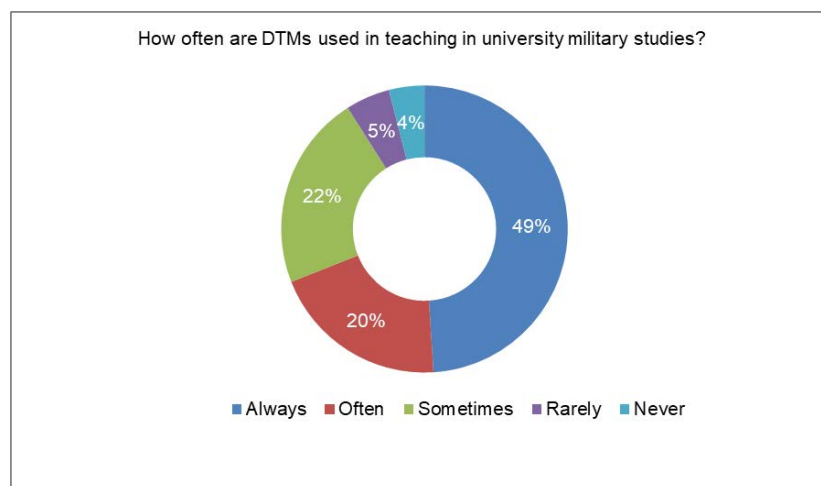


Figure 5. Frequency of use of DTM in teaching in university military studies

Of the total number of respondents, as many as 49% of respondents answered that DTM is used in teaching in university military studies, almost always which means that DTM is present in them almost every hour. Furthermore, 20% of respondents state that DTM is often used in teaching, 22% of respondents sometimes have DTM in teaching at university military studies. Furthermore, 4% point out that DTM is not used in teaching and 5% that it is very rarely used in teaching in university military studies. The importance of presenting the attitudes of cadets in the introduction of innovations in the teaching process has always been an interesting topic, so it is the subject of numerous studies, including the research conducted in this paper. Namely, it should be noted that the aim of this paper was to present the attitudes of cadets in university military studies towards the application of DTM in teaching. From the obtained results we can conclude that cadets in military studies in the Republic of Croatia are very well acquainted with the DTM Merlin system and that they have very positive attitudes

towards the use of the Merlin system in teaching. The results of the research show the attitudes of cadets during the introduction of new technologies in the teaching process. It has always been an interesting topic of numerous researches, among which the research conducted in this paper. Namely, it should be noted that the aim of this paper was to present the attitudes of military school cadets towards the use of DTM in teaching. From the obtained results we can conclude that the cadets of military schools in the Republic of Croatia are very well acquainted with the DTM and Merlin system and that they have very positive attitudes towards the use of DTM in teaching.

The results of the research confirm hypotheses 1 and 2, that is, the results confirm the hypotheses that cadets of military schools have a positive attitude towards DTM. Therefore, based on a questionnaire conducted on a sample of 498 cadets of military schools in the Republic of Croatia, the results show that respondents generally use DTM quite often in teaching at university military studies, which refutes the third hypothesis that military cadets do not use often DTM in teaching. Namely, it must be taken into account that the average age of the respondents (cadets) is 22 years, which means that the respondents are relatively young, so the question arises whether the results would be different given how the age of the respondents would change. Finally, it should be noted that, although research has shown that cadets encounter certain difficulties in using DTM, their positive attitude and good will enable quality integration of DTM into teaching in university military studies. It follows that a positive attitude, goodwill, initiative and creative approach of the cadets are a decisive factor in the integration of DTM in teaching in university military studies.

4 CONCLUSIONS

Due to the efforts to improve the quality of the teaching and learning process, there is a growing need for the introduction of LMS - Merlin in the education system at military university studies in the Republic of Croatia. This paper presents the development of the LMS Merlin system and DTM for course delivery on the example of military university study with its advantages and disadvantages. Research has shown that the use of LMS-Merlin with DTM contributes to a more relaxed, but at the same time working atmosphere. Furthermore, cadets see the purpose of using digital content in teaching and their connection with examples from everyday life. Therefore, they also estimate that they have mastered the material well in the classes where digital educational material was used. Then the activity and motivation in the class is increased. Namely, the research also showed shortcomings by talking about the resources needed to use DTM in teaching. It is necessary to provide exactly those elements that will help to overcome these problems. Professors and cadets should be provided with appropriate support both in technological terms (availability and knowledge of the use of LMS) and in methodological terms (knowledge of teaching methods and procedures that enable quality application of DTM in teaching). Nowadays, teaching and their stakeholders are professors, cadets are tightly intertwined with information and communication technologies, and information and communication devices facilitate the everyday challenges faced by stakeholders of teaching processes through DTM. The LMS e-learning process can be observed through four essential elements: professor, digital teaching materials, technology and cadet. This learning process differs from classical learning in that computers are an educational technology that contains digital teaching content. From the point of view of the set of different educational tools needed for computer-based learning, it should be emphasized that this is only a new educational tool, e-learning, and not a new way of education. Therefore, the attitudes of cadets towards technology, ie towards DTM, are key factors for the use of technology in teaching and therefore in this paper we wanted to show what are the attitudes of cadets in university military studies in the Republic of Croatia. According to the results of the research, cadets of military studies in the Republic of Croatia have positive attitudes, sufficient knowledge and desires, and manage to take advantage of all the advantages that new technologies bring. We believe that this paper will serve as a challenge to others in further exploring the role of LMS-Merlin and DTM in teaching in university studies.

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