Actual Areas of Development of Digital Competence of Officers of The Armed Forces of Ukraine

Olha Pinchuk[1], Alla Prokopenko[2]

[1] *Institute for Digitalisation of Education of the National Academy of Educational Sciences of Ukraine, 9, M. Berlynskoho Str., Kyiv, 04060, Ukraine*
[2] *The National Defence University of Ukraine after Ivan Cherniakhovskyi, 28, Povitroflotskyi avenue, Kyiv, 03049, Ukraine*

Abstract

The purpose of the study is to find ways to solve the current problem of improving the military education system. The needs in the formation and development of digital competencies of military management officers in different competence areas were studied: information and data literacy, communication and collaboration, digital content creation, safety and problem solving are studied. Possession of a high level of competence in these areas, according to the authors, significantly affects the professional development of officers during their military careers. The attention is focused on the possibility of implementing transdisciplinary integration in the system of advanced training of officers of the Armed Forces of Ukraine. The subject of the study, among other things, was the formation of readiness to use STEM-technologies in professional activities. The study reviewed modern STEM-approaches in the educational process and analyzed the experience of countries such as the United States, Australia, China, Britain, Israel, Korea, Singapore. The results of the survey among the students of advanced training courses at The National Defence University of Ukraine named after Ivan Cherniakhovskyi are highlighted. In particular, the attitude and needs of military management officers to training and professional development were clarified; identified their educational interests. In particular, the need for effective ownership of tools for planning and organizing project work, analysis and evaluation of achieved results is identified.

Keywords

STEM-education, STEM-technologies, digital competence, digital tools, the Armed Forces of Ukraine, military management, military education, transdisciplinary integration, ICT, lifelong learning, professional development during a military career.

1. Introduction

Information and communication technologies (ICT) have become drivers of innovative economic development of the leading countries of the world and the EU. Studies of various aspects of the impact of ICT on motivation and academic progress indicate the recognition of ICT as a multi-purpose tool for solving educational problems [1, 2, 3, 4, 5, etc.]. In the field of ICT that we most clearly observe the development of new elements of innovation ecosystems, which are aimed at supporting the interaction of all aspects of innovation processes: government, business, education, science and civil society, including military management. Information and data literacy, Communication and collaboration, Digital content creation, Safety and Problem solving should be areas of high digital competence of officers. The use of information and communication and network

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EMAIL: opinchuk100@gmail.com (A. 1); allicka7@gmail.com (A. 2)
ORCID: 0000-0002-2770-0838 (A. 1); 0000-0001-5719-844X (A. 2)

technologies is a decisive factor in fulfilling conceptual social demands to solve problems: reduced resilience of human ecosystems, extremely high rates of social processes, low probability of predicting natural, social, economic, technical and technological processes and phenomena, lack of available information for decision-making. Digital transformation covers all areas and spheres of human life, because, first of all, it is a social transformation, which has a sign of maximum use of digital technologies such as: Internet of Things, Industry 4.0, artificial intelligence, robotics, big data processing, cloud computing, electronic communications, as well as nano- and biotechnology, genetic engineering, etc. There are significant changes in the system and structure of social relations as a whole in society and in its individual segments. Our research interests focus on the lifelong education of servicemen, or more precisely, the education of officers during advanced training. This thematic direction is an integral formation, which on the one hand is the direction of development of digital humanistic pedagogy in general [1], and on the other – has characteristic properties inherent only in the field of national defense and military management (state policy on professional growth, the concept of training Armed Forces of Ukraine (AFU), development of the security and defense sector of Ukraine [6,7].

It should be noted that the European Commission has been quite active in focusing on digital education. A Digital Education Action Plan (2021–2027) has now been developed to promote a highly efficient digital education ecosystem and enhance digital skills and competences for digital transformation [8]. What and how should change in education systems to meet today's digital challenges? Among the tasks in this document are: updating the European Digital Competence Framework (DigComp 2.0, DigComp 2.1) by including position on artificial intelligence (AI) and data-related skills; development of ethical standards for the use of artificial intelligence and data about students and teachers in the learning process; further development of computing education (including confidentiality, security, information ethics, software engineering, etc.) as a basic digital skill; promoting women's participation in STEM with The European Institute of Innovation and Technology (EIT) and the EUSTEM Coalition.

Under modern conditions, to ensure the competitiveness of Ukraine among the countries of the European Union, it is important to introduce pedagogical technologies that help improve the quality of training in the field of high technology. However, the acquisition of a high level of professionalism in various fields increasingly requires awareness and appropriate practical training of specialists in various fields of knowledge in areas covering STEM education, in particular, engineering, nano- and IR technologies. The introduction of ICT is aimed at improving the quality of military education. Does the training and advanced training of UAF officers fall within the scope of such modern educational trends? In our opinion, definitely so. Therefore, it is important to explore the relevance and necessity of the formation and development of relevant digital competencies of such a target audience, to take into account different competency areas: Information and data literacy, Communication and collaboration, Digital content creation, Safety and Problem solving [9].

2. Related works and recent research

Tibor Navracsics European Commissioner for Education, Culture, Youth and Sport said: "*Knowledge related to science, technology, engineering and maths (STEM) is crucial in responding to the challenges we are facing as a society*" (in office 2014 – 2019). The Strategy for the Development of Innovation until 2030 identifies the following key factors of high priority to STEM during last time: the first is related to overcoming the global economic crisis that has affected each country in recent decades; the second - a significant need for professionals who have comprehensive knowledge and flexible skills that meet the requirements of the XXI century; third – the social demand for STEM literacy, necessary to solve technological and environmental problems of society [10].

The acronym STEM came into general use after a meeting of the interagency meeting on scientific education (2001), held at the US National Science Foundation, chaired by NSF Director Rita Colwell. STEM is used to denote a popular field in education, covers the natural sciences, technology, engineering and mathematics. This direction in education often strengthens the natural science and technological components in educational programs. It should be noted that the emphasis on these two components has recently been criticized by scientists and educators. For example, Lyn D. English [11]

after a careful analysis of the materials of the STEM conference (http://stem2014.ubc.ca/presentations/) statistically proved that mathematics and engineering are given much less attention. In our opinion, it is not appropriate to use STEM to refer to only one or two disciplines, this is a disadvantage that does not allow full implementation of integration approaches. It is the inter / multidisciplinary approach that is the basis of STEM. The essence is as follows: on the one hand, students master the basic concepts and use the acquired skills separately for each discipline, but in the learning process they are presented within a certain generalized topic. On the other hand, as a result of the integrated use of combined concepts and skills from several disciplines, students have the opportunity to deepen their understanding of each separately. Last but not least, closely related disciplines are used to solve real problems and implement educational projects and to form a common learning experience.

In [11] the author distinguishes four levels of integration processes: disciplinary, multidisciplinary, interdisciplinary, transdisciplinary. Although, in our opinion, the ideology of STEM corresponds to the latter, that in the author's vision is "… knowledge and skills from two or more disciplines are applied to real-world problems and projects with the aim of shaping the total learning experience."

At present, *the development of STEM-oriented curriculum and projects without focusing on the skills of the twenty-first century, including researches, problem solving, critical thinking, creativity and innovation, is impractical.*

Many foreign scholars, namely M. Harrison [12], Derek Riley, Colleen McCann, Yvonne Woods [13], N. More [14], Elaine J.Hom [15] note that the introduction of STEM education involves interdisciplinary and project-based approaches. The main place in STEM is given to practice, which combines different scientific knowledge into a single whole.

Training through the engineering design process is also being introduced. This is the basis of STEM pedagogy. Students learn in practice, they are encouraged to develop a new understanding, clarifying their ideas [16, 17].

The introduction of STEM-education in educational institutions of various specialties was studied by such domestic scientists as O. Hrybiuk [18], Y. Botuzova [19], L. Gryzun [20], I. Chernetsky [21, 22], N. Polikhun. [21,22], I. Savchenko, V. Sipiy, O. Strizhak [21], N. Morse [23], L. Klimenko [24] and others. Regarding the implementation of STEM at the level of higher education A. Kolomiets and V. Kobisya. Main support of STEM-education implements state policy taking into account the new requirements of the Law of Ukraine on Education on the following: strengthening the development of scientific and technical direction in teaching and methodological activities; creation of scientific and methodical base for increase of creative potential of youth; development of professional competence of teachers, mathematical literacy, competence in natural sciences and technologies, information and digital literacy [25, 26].

The implementation of the ideas of STEM-education in Ukraine involves the implementation of a number of measures to update the material and technical base of educational institutions, research laboratories. Also, STEM-education aims to introduce innovative technologies in higher education in order to improve the training of future professionals by improving curriculum through the digitalization of education, which is a modern stage of its informatization and depends on objective conditions and current trends in the information society, including:

- development of artificial intelligence, machine learning, artificial neural networks;
- ensuring the mobility of information and communication activities of users in the information space, further development of mobile-oriented tools and ICT access to electronic data;
- development of cloud computing and virtualization technology, corporate, public and hybrid ICT infrastructures and introduction of fog computing technology;
- development of new functions of added reality and availability of equipment for virtual reality and devices of mixed reality;
- introduction of chat bots and virtual assistants;
- formation of the Internet of Things (IoT);
- development of robotics, robotic systems, in particular, 3D printers and 3D scanners;
- development of data security and counteraction of cyber criminality) [15, 27].

Current trends in the development of the information society are causing changes in the field of military management. Given the topic of our study, we pay special attention to the following areas:

development of artificial intelligence, machine learning, mobility of information and communication activities of users in the information space, development of mobile tools and ICT access to digital data, accumulation and processing of large amounts of data; formation and use of electronic information databases and systems, ensuring the compatibility of ICT tools and ICT applications, development of data protection systems in information systems and combating cybercrime.

Different teaching methods should be used in the implementation of STEM education, but we agree with the vast majority of researchers that problem-based learning and project-oriented learning methods have a special place because they involve students in actively acquiring special subject knowledge and skills and experience of scientific activity. Such activities should be based on complex real technical problems and accurately worked out tasks.

New professions will appear in the future. It is expected that bio- and nano-technology specialists will be especially in demand, the most popular and promising specialists will be engineers, high-tech professionals, etc. All of them will be related to technologies and high-tech production, which are at the intersection of the natural sciences.

It is important to create a positive motivational guideline for a non-traditional approach in the learning process [28]. At present, STEM education is the basis for training in the field of high technology. Currently, in countries such as Australia, China, Great Britain, Israel, Korea, Singapore, and the United States, government programs in the field of STEM education are being actively implemented, combining a project and interdisciplinary approach. The most actively promoted STEM approach in education of the United States of America, the list of these specialties is very large - more than four hundred. For example, the number of STEM majors at Oregon State University is 169.

STEM specialties include the most complex areas that are currently in high demand in the United States. STEM specialists are in demand in various fields: computer programming, information technology, bioengineering, biomedicine, electromechanics, molecular biology, pharmacology and toxicology, psychology, social anthropology, etc. Among the most in demand today are: information security analysts, cartographers who use digital geographic information systems, and architects with skills of digital design, 3D modeling. Such specialists with a high and expert level of digital competencies [9], which allows to effectively analyze and interpret data for practical purposes, in demand in the military field.

In our opinion, these specialties require a high and expert level of digital competencies [5], which will effectively analyze and interpret data for practical purposes.

In the field of military management, the officer is expected to be aware of readiness, competence in implementing innovative ideas, making effective management decisions, productive actions in situations with a high percentage of uncertainty, and therefore must have some technical experience, knowledge and skills in information technology and software, be able to use digital tools for planning and analytics. Knowledge of digital means of communication, web applications, understanding of design principles, development of analytical abilities, development of abilities to non-standard thinking are actual for officers. It is known that every project is driven by a certain framework. The risk of losing control over project management is critical. To plan and conduct project activities, we offer to use specialized programs and platforms: Asana, Todoist, Slack, Trello, Planner, GanttProject, which we consider as modern effective digital tools. Mastering them during advanced training is necessary for officers-future project managers and participants in project activities. The list contains both relatively simple programs and programs that can be used to professionally create Gantt charts for complex tasks and to analyze performance. The convenience of these programs is that all information is stored in cloud storage, which is widely available. Consequently, the relevance of the development of digital competence of officers of the Armed Forces of Ukraine in the system of advanced training is growing.

Ukraine is a party that has ratified a number of documents through the instruments of the Council of Europe and the EU in the field of education and has adopted at the legislative level provisions for the harmonization of Ukrainian standards and mechanisms of harmonization processes in digital transformation. It is also planned to restructure the military education system in accordance with NATO standards. This should improve the quality of education and promote the interoperability of the Ukrainian Army with NATO forces.

This article is the result of analytical study of modern educational, industrial and technological trends, scientific publications and documents, regulations in the area of military management and

analysis of own experience in researching the most relevant areas and fields of formation and development of digital competence of UAF officers.

3. Results and Discussion

Digitalization as a modern stage of informatization of society is manifested in the saturated physical world with electronic and digital devices, means of activity in various fields and systems (networks) for communication, actually creates cyberspace and puts forward new requirements for training officers in the armed forces of developed countries.

Nowadays, the military profession requires a much larger range of competencies than 20-30 years ago. Informatization of society, education, economy and industry makes new demands on the training of officers of the armed forces of developed countries. Formation of readiness for the application of STEM-technologies in the professional activity of an officer is a little-studied problem by domestic scientists. The readiness of officers of the Armed Forces of Ukraine (AFU) to use STEM-technologies in professional activities is a set of tools, methods and processes built on the integration of science, technology, engineering and mathematics, as well as logical thinking, leadership, cooperation and research, which provides effective professional activity [29]. The readiness of an officer can be characterized as the ability to interact and interact between all parts of the control system, operation and combat use of weapons and military equipment. and reading sign systems. Readiness is the basis for the formation of competencies of military specialists of the Armed Forces of Ukraine, provided by the professional standard. The competence of a military command officer is seen as the ability to solve complex problems and practical problems in the field of military sciences, in the management of military units of the armed forces and other military formations and law enforcement agencies in everyday activities and during joint tasks in group operations. troops (forces) and while working as part of interspecific bodies of military management using the theory and methods of military science, which involves research and / or innovation and is characterized by uncertainty of conditions and requirements. ICTs have the potential to provide military management specialists not only with tools for planning and organizing work, but also to provide an opportunity to conduct research on various processes and evaluate the results achieved. From the officer of military management, the state requires the ability to think abstractly, plan and manage time, developed the ability to analyze and synthesize, to make independent informed decisions [28]. These requirements, in our opinion, correlate with the descriptors of competencies information and data literacy, problem solving, as defined by the DigComp 2.1.

We studied the requirements for the military in other countries. For example, the United States Department of Defense believes that military personnel play an important role in improving the well-being and prosperity of the entire state. In order to achieve the outlined tasks, the concept of STEM education is being actively implemented in postgraduate training of military specialists in order for the US Army to remain a leader in the fields of science and technology. STEM education is of key importance during advanced training. It is worth noting that in the US Armed Forces, professional development is seen as one of the defining conditions for the realization of their personal, military, professional and professional prospects for career advancement. Today, the United States has created and operates a modern system that is organically integrated into the system of phased training of military specialists, consistent with their career advancement, allows them to improve their professional and professional levels throughout the service. Its operation is coordinated by the Office of the Assistant Secretary of Defense for Personnel through the US Armed Forces Command, which generally ensures its successful operation.

In view of the above, following the basic provisions of STEM education will increase the motivation of officers to develop their professional competence, career growth, and as a consequence - to increase the level of defense capabilities of the state as a whole.

Actualization of the need for application of STEM-technologies in professional activities by AFU officers provides purposeful modeling and development of situations in which it is necessary to acquire new knowledge, develop skills, solve professionally important tasks that will require them to show professionally significant and personal qualities, including high and expert level of digital competencies.

Project activities, as we have already mentioned, have great potential for the implementation of STEM-education tasks. Acquisition of digital competencies in the use of ICT, development of creative thinking, willingness to interact productively and work responsibly in a team are no exception. All of the above creates extremely favorable conditions for the development of the competence of officers of the military administration of the Armed Forces. Implementation of STEM-education in the system of advanced training of military management officers can provide: increase the interest of servicemen in engineering, motivate them to master modern technical developments, participate in the development of technological solutions. In our opinion, this can be facilitated by the creation of an appropriate digital training and methodological resource for the coordination and development of STEM, the development of officers' own STEM projects during training and advanced training. The introduction of advanced pedagogical technologies, including the project-based learning , naturally increases the level of motivation and cognitive interest.

We share the opinion of researchers who consider the degree of motivation to be one of the criteria for the effectiveness of vocational education. Motivation characterizes the orientation of the individual [30].

Various aspects of the formation of sustainable motivation of servicemen are revealed in the works [31; 32; 33].

Contrary to the exceptional potential of the STEM phenomenon for the formation and development of professional competencies of military management specialists, our analysis of scientific sources revealed a lack of work on the introduction of STEM technologies in the training of military officers of the Armed Forces of Ukraine. At present, this indicates that military education does not fully take into account current social trends.

We also studied the specifics of the professional activities of military officers in planning and resource management in the field of defense, project management in the field of informatization and project management in the Armed Forces of Ukraine, as well as in the organization of intelligence activities. These categories of servicemen must possess and be able to apply the basic provisions of the concept of IT project management. In particular, to know the procedure for formulating the purpose of the IT project, determining the timing of its implementation, effective methods of launching, planning, implementation, control and closure of IT projects.

In March-April 2021, at The National Defence University of Ukraine named after Ivan Cherniakhovskyi, we conducted a survey of advanced training students to address the following tasks: to investigate the attitudes and needs of military officers to train and improve their professional level; identify needs to improve the professional level of military officers in the use of digital teaching aids and ICT, identify current issues. The answers to the questionnaire will help to provide more accurate recommendations to stakeholders on the use of digital tools for professional activities; improved the organization and content of advanced training courses; to choose for studying and improvement of skills of listeners those means and methods which will help them to carry out official duties effectively; determine the need of students for additional knowledge and skills in the field of digital technologies.

The survey was anonymous, conducted online using Google Forms, covered 116 respondents, the vast majority (percentage) aged 40 to 45 years. Among them are 99 men and 17 women.

We found that in terms of basic education, the majority of respondents have a technical education of 39% and a general military education of 27%. Figure 1.

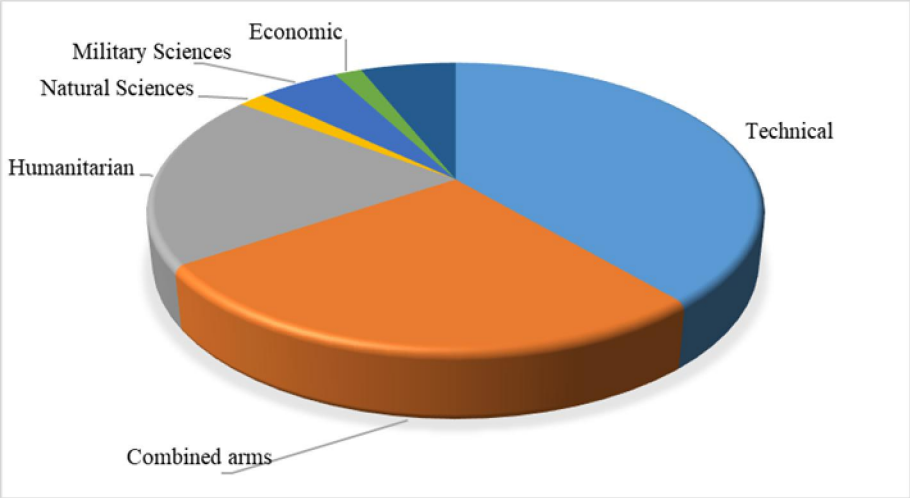

Figure 1. Basic education of students of advanced training courses

This makes it possible to use STEM approaches during training. The fact that 62% of respondents pursue their educational goal to maintain / improve their skills, and 36% - before appointment to a higher position, Figure 2 suggests that the content of training should be directly related to the development of leadership and management competencies inherent in managers level of military management. Capable of solving complex tasks and problems involving research and / or innovation and characterized by uncertainty of conditions and requirements in the field of management of military units, planning and conducting operations of interspecific groups of troops by military authorities, as well as maximum implementation of operational (combat) capabilities of groups of troops (forces). Students are required to think critically, explore complex processes and phenomena, prepare and present the results of individual and collective work. Therefore, each officer must have certain competencies and have the necessary case of theoretical knowledge, skills and abilities, with which he can effectively and safely use modern digital technologies in work and in the learning process every day. Therefore, the relevance of the use of ICT tools for the development of digital competence in the areas of Information and data literacy, Safety and Problem solving - is extremely high.

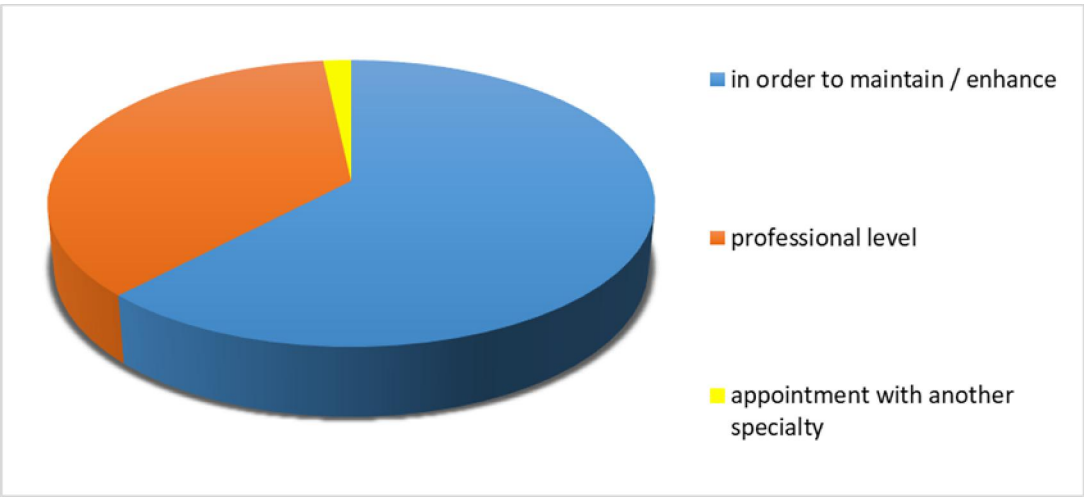

Figure 2. The purpose of realization of educational interests of participants of advanced training courses

77% of respondents said that the use of tools to search, process and analyze information from various sources will contribute to their effectiveness in the performance of official duties. 57% of respondents preferred tools for compiling official documents and analytical reports Figure 3.

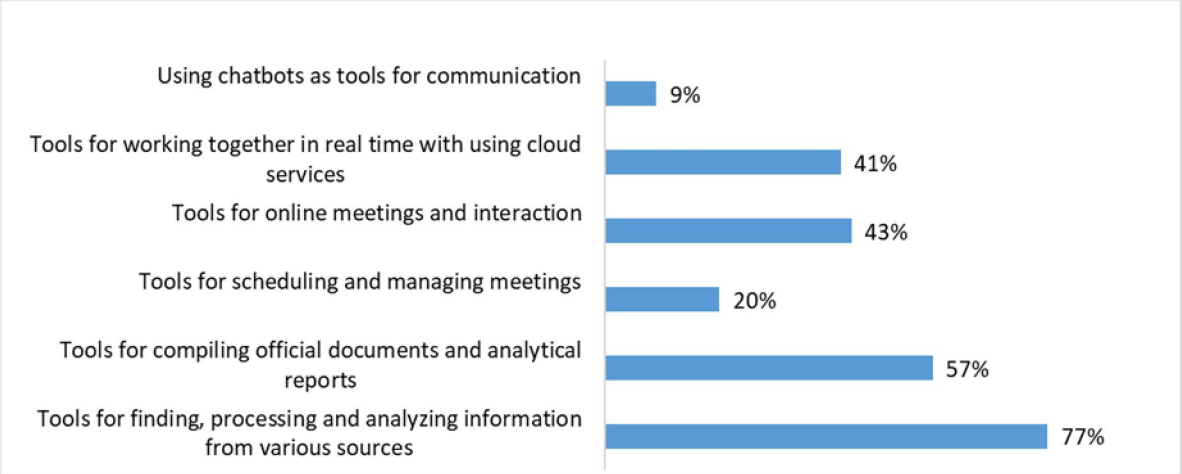

Figure 3. Current needs of participants in digital tools

The information in Table 1 clearly illustrates the need of officers for the formation and development of digital competencies in various areas: Information and data literacy, Communication and collaboration, Digital content creation, Safety and Problem solving.

Table 1
Current needs of participants in digital tools

Which digital tools do you think will help you be more effective in performance of official duties?	%
Tools for finding, processing and analyzing information from various sources	77
Tools for compiling official documents and analytical reports	57
Tools for scheduling and managing meetings	20
Tools for online meetings and interaction	43
Tools for working together in real time with using cloud services	41
Using chatbots as tools for communication	9

The results of the survey showed that 48% lacked skills in working with services to create infographics, 36% said they would like to have security and privacy settings, 31% preferred planning services, and 48% expressed a desire to have chat skills bots Figure 4. The results show that officers are interested in developing digital competencies in well-defined areas.

Respondents' answers to questions about ways to gain new knowledge in the field of digital technologies determined the advantage of training in advanced training courses.

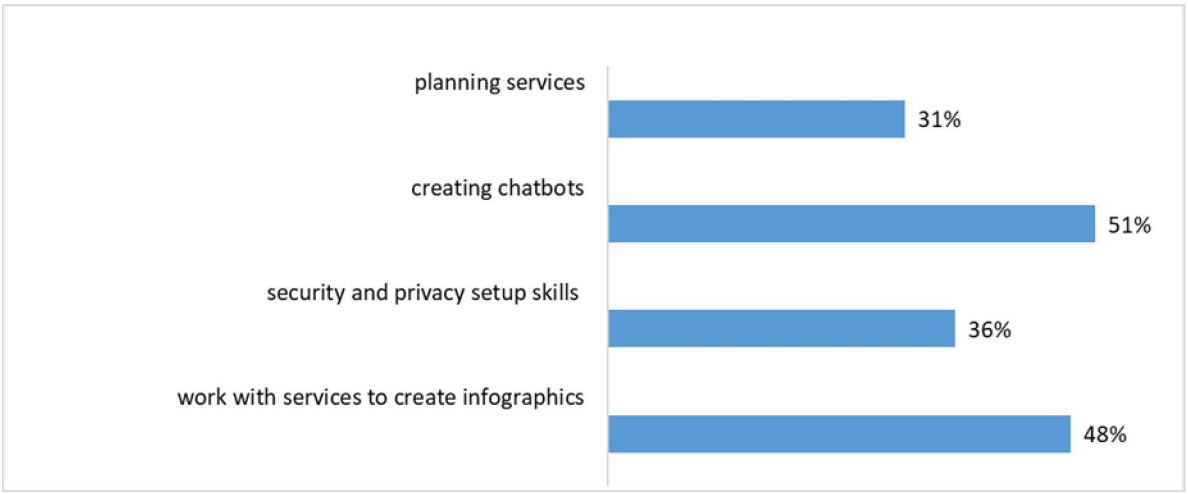

Figure 4. The need for digital skills of students of advanced training courses

For us, the result of a relatively large proportion of respondents who feel the need to have the skills to create such a software product as a chat bot was unexpected. However, to create such digital content you need to have certain programming skills. And for this - to increase competence in the relevant field.

During the study we also found out which digital tools respondents use in the line of duty, how much time they spend working with computers without the Internet, and how much time they spend with free access to the Internet.

The results of our study indicate that modern officers are aware of the need for continuous development of digital competencies, which is an important component of the professional competence of a modern military management specialist. Digital competence implies knowledge, skills and conscious willingness to use digital technologies for the effective organization of official activities, to critically evaluate information resources and apply technological innovations.

In the world, digital competence is recognized as one of the key competencies for a full life and activity of citizens. Digital competence is key in the context of the fourth industrial revolution. The creation of digital content (including programming), security (including the protection of personal data in the digital environment and cybersecurity), as well as the ability to solve professional problems and learn throughout life using ICT - all this was a well-known need for military officers. The results of our study fully confirm the exceptional need for the development of digital competence in officers of the Armed Forces of Ukraine, as they believe that possession of digital tools at a high level is a guarantee of professional and personal development. The internal motivation of the respondents, which is aimed at increasing professional competence, is revealed.

As military management officers consider the most effective forms of professional development to be training in higher military education institutions, we consider it necessary to modernize the training system in accordance with NATO standard Bi-SCD 075-007 "Education and Training", which, on the one hand, improve the quality of education, on the other hand, promote the interoperability of our forces with NATO forces. Since 2012, the Armed Forces of Ukraine have been participants in the Defense Education Enhancement Program (DEEP). This is a program to improve military education. The program brings together experts from NATO's educational and research institutions, such as the J. Marshall Center for European Security Studies, the NATO Defense College, the NATO School in Oberammergau and others.

4. Conclusions and prospects for further research

The National Economic Strategy of Ukraine for the period up to 2030 identifies European and Euro-Atlantic integration, as well as the development of the digital economy as one of the drivers of Ukraine's economic growth. It is generally recognized that underdeveloped digital skills in citizens hinder the full transition to the digital economy. The overall assessment of digital literacy of citizens in Ukraine shows that 53 percent of citizens are below the "basic level" [34]. A major barrier to

achieving national strategic goals is poor coordination between the IT sector and the education sector; lack of specialists in such promising areas as Big data, IoT, artificial intelligence; lack of quality educational STEM-programs [35].

Improving the level of professional and specialized digital skills of citizens in various fields of activity is an unconditional priority of the digital economy and a reliable way to achieve its strategic goals. The Concept of Development of Digital Competences approved by the Cabinet of Ministers of Ukraine in March 2021 [2] establishes the conceptual foundations of state policy in the field of development of digital competencies of citizens, which will ensure the development of all spheres of public life in accordance with modern requirements.

It follows that during retraining and advanced training, military management officers should be able to increase the level of their competence comprehensively: researches, application of ICT, management technologies, project organization and implementation, and so on. Training should be properly equipped with modern hardware and software. In our opinion, the use of STEM-technologies will allow to take a comprehensive approach to solving the problem of developing the competence of officers of the military command of the Armed Forces.

In our opinion, the US experience in actively implementing the concept of STEM education in postgraduate training of military specialists in order to create favorable conditions for the realization of their personal, military, professional and professional prospects, as well as achievement by the armed forces of the position of a leader in the field of science and technology.

The implementation of STEM education in the system of advanced training of military officers can provide: increase the interest of servicemen in engineering, motivate them to master modern technical developments, participate in the development of technological solutions to solve professional problems. This, in our opinion, can be facilitated by the creation of an appropriate digital training resource for officers to develop their own STEM projects during their study and advanced training.

The analysis of scientific sources revealed the lack of work on the introduction of STEM-technologies in the process of professional training of military officers in Ukraine. At present, this indicates that military education does not fully take into account current social trends.

The training of highly qualified officers of the military administration of the Armed Forces in modern military education has its own specifics, as these specialists must be competent in specific issues of military management, have highly organized thinking skills and be able to effectively perform tasks. We propose to apply an interdisciplinary approach to the training of officers, which is implemented in STEM-education, combining such components as robotics, IT and programming. The application of such an approach, in our opinion, will have positive consequences: improving the quality of students' understanding of disciplines related to the field of science, technology, engineering and mathematics; increasing the level of their digital competence, strengthening the research and scientific and technological potential of students, developing skills of critical, innovative and creative thinking, the ability to solve problems.

During the study of the specifics of the professional activities of military management officers identified the needs of this category of servicemen in the knowledge of IT project management. The results of the survey, analysis of current research on the issue allow us to conclude that there is a need for the formation and development of digital competencies of military officers, taking into account different areas: information and data literacy, communication and collaboration, digital content creation, safety and problem solving. The use of STEM technologies in the practical training of military officers will contribute to their personal and professional development and career growth. In our opinion, the professional development of officers of the Armed Forces should be carried out in the following areas: artificial intelligence; machine learning; ensuring the mobility of information and communication activities of users in the information space; formation of skills of using mobile and cloud-oriented means of access to information, digital tools for planning and organizing project work, data processing and performance evaluation; formation and use of electronic information databases and systems; data protection in information systems and combating cybercrime.

We see prospects for further research in the development and implementation of methods for the formation of digital competence of military officers, to ensure their continuous professional development. Also, in clarifying the conditions for the introduction of educational robotics in higher military education.

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