

Article Information

Submitted: January 19, 2024

Approved: February 06, 2024

Published: February 07, 2024

How to cite this article: Kozubtsov I, Nesterov O. The Conceptual View of the Department of Combat use of Communication Units on the Creation of a Training Game Complex for Training Military Specialists on the Basis of Leadership. *IgMin Res.* Feb 07, 2024; 2(2): 048-058. IgMin ID: igmin145; DOI: 10.61927/igmin145; Available at: www.igminresearch.com/articles/pdf/igmin145.pdf

Copyright license: © 2024 Kozubtsov I, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ORCID:

Kozubtsov I: <https://orcid.org/0000-0002-7309-4365>

Nesterov O: <https://orcid.org/0000-0001-5092-6205>

Keywords: Cadet; Leader; Department; Military education; L-1B; Tactical level of military education



Review Article



The Conceptual View of the Department of Combat use of Communication Units on the Creation of a Training Game Complex for Training Military Specialists on the Basis of Leadership

Igor Kozubtsov^{1*} and Oleksandr Nesterov²

¹Doctor of Pedagogical Sciences, Professor, Professor of the Department of Combat Use of Communication Units, Heroes of Kruty Military Institute of Telecommunications and Informatization, Kyiv, Ukraine

²PhD, Head of the Department of Combat Use of Communication Units, Heroes of Kruty Military Institute of Telecommunications and Informatization, Kyiv, Ukraine

***Correspondence:** Igor Kozubtsov, Doctor of Pedagogical Sciences, Professor, Professor of the Department of Combat Use of Communication Units, Heroes of Kruty Military Institute of Telecommunications and Informatization, Kyiv, Ukraine, Email: kozubtsov@gmail.com

Abstract

Today's cadet leader is tomorrow's officer, a professional capable of integrating knowledge and solving complex problems in a full-scale war with incomplete information, being a leader and authority for the personnel. Most of the time, cadets study in study groups using traditional technology, which is not enough to form a professional cadet leader. With the advent of computer technology, students' and cadets' motivation to learn using traditional teaching methods has paradoxically begun to decline rapidly. The problem of the quality of training of military specialists for the needs of communication and cybersecurity units is not reflected in the publications reviewed. However, significant progress has been made in the use of computer technology as the basis of training tools for ground forces units. Similar training complexes are actively used in NATO member states in the military education system in the training of air force pilots (navigators). Therefore, the author chose the improvement of the educational process at the Department of Combat Use of Communication Units in combination with the methodology of professional-business game for the development of a cadet leader in professional training courses (L-1B) of the tactical level of military education as the direction of research. The purpose of the study and the article is to substantiate the conceptual view of the department in the need to build a computerized training complex for training officers of leaders in professional training courses (L-1B) of the tactical level of military education, capable of using communication units based on computer games. Fragments of the game mechanics of stimulating the interest and motivation of cadets to study, for example, electronic shooting range, and learning Morse code, are considered. Game mechanics is a proof of a professional business game in the course of the discipline: Combat use of military communication systems and complexes of the course of professional military education (professional course of tactical level L1B).

Introduction

With the advent of computer technology, students' and cadets' motivation for traditional teaching methods began to decline paradoxically rapidly. Game-based and interactive methods of teaching adults have come to the forefront.

It should be noted that modern technologies allow many things to be interactive, i.e., those in which the user can take some part. A computer screen or a video movie can be interactive. There are different ways to achieve interactivity. For example, while a video movie can simply include an element of a computer game, a paper

book can allow the cadet to go to a particular page depending on his or her wishes. The introduction of interactive forms of education is one of the most important areas of improving the educational process in higher military educational institutions (HMEIs). Today, the main methodological innovations in the field of pedagogy are associated with the use of interactive teaching methods. The first interactive form of education was the use of training complexes, which played an important role in the system of combat training of military specialists of communication units in the Armed Forces. Their widespread use in military training occurred in the early 2000s when computer technologies began to be introduced in HMEIs.

Study [1] became the basis for substantiating the need for further reform of combat training in the Armed Forces of Ukraine. The author advocates the use of computer-based learning to improve the educational process. This was at a time when computer technology was just beginning to be used.

The idea was used to further substantiate the use of computer technology as the basis of training equipment for missile forces and artillery [2]. Of course, the disadvantage of that time was the lack of simulators in the training equipment, which did not provide proper realism in performing certain mechanical actions, and therefore the acquisition of skills by a person (operator).

The idea of using a computer to help a teacher at an HMEI is not new. V. Bepalko was one of the first to substantiate the appropriateness of using computers in teaching children at school, but as an auxiliary tool [3]. The first conceptual ideas and outlines of the requirements of the future structure of the construction of educational and training complexes based on the computer are presented in a research paper [4] with the justification of learning based on an activity-based approach (L. Vygotsky, P. Halperin, V. Davydov, A. Leontiev, V. Shadrykov, V. Yudin, etc.) However, when modernizing existing and creating new military training complexes based on computer technology, the authors led by I. Rusnak [5] recognized the problems in acquiring practical skills by a person (operator).

The next trend in the use of computer technology in training is gamification. Gamification has also not escaped the higher education institutions. And now the next modernization of the system of higher military education is the development of conceptual foundations for the use of training complexes based on computer games [6]. Gamification is the process of applying game technologies in education, which attracts the attention of a significant number of researchers from Ukraine in the field of military education. In our opinion, gamification should not be based solely on the use of training complexes based on computer games but should be in line with professional business games. This thesis will be discussed in the results section of the study and is based on a long experimental study launched in 2009. An innovative prototype of gamification was the development of the concept and methodology of independent learning of cadets in training facilities by playing a game on a virtual computer [7]. The experimental results of that time convincingly showed an increase in the motivational interest of cadets in learning military and professional disciplines by non-standard means and approaches that can be used by teachers within the framework of traditional teaching regulations.

For example, V. Bugaeva also suggests considering gamification as a separate innovative educational technology [8, p.135]. If gamification is considered from the perspective of pedagogical technology, then in this case, a computer game has a great potential for a positive impact on the effectiveness of the educational process and the formation of active professional behavior of students [9]. The use of gamification as a technology in education is reflected in the publication [10, p.25]. In contrast to the vision of the previous researcher, gamification is seen as a concept of applying game mechanics and game design methods to awaken human motivation.

The practical application of gamification in teaching based on game methods and strategies of teaching and upbringing is given considerable attention in works [11-13], the review of which we omit, since all the results convincingly show an increase in students' interest in learning compared to traditional teaching methods (narration, demonstration).

The results of the testing confirm that gamification has become a pedagogical technology [14-16]. The works are grouped on a personality-oriented approach to learning (K. Abulkhanova-Slavaska, G. Ball, I. Bekh, S. Goncharenko, V. Davydov, I. Ziaziun, V. Kraevskiy, V. Moliako, A. Petrovskiy, V. Rybalka, K. Rogers, O. Savchenko, etc.) However, at that time, when developing a personality-oriented approach to professional training [17], the need to develop the leadership qualities of future officers was not in the field of view. Information on the psychological support of the development of leadership qualities of future officers is reflected in the work of N. Agayev, O. Kokun, I. Pishko, N. Lozinska, M. Herasymenko, and V. Tkachenko [18].

When teaching cadets the topic of field information and communication nodes (FICN) of control points within the framework of tactical and special disciplines, there is a need not only to explain the principles of their functioning of communication means as part of the complex, but mainly to cultivate a sense of responsibility of each cadet as a future leader in organizing its functioning. The vast majority of the study time (75-85% of the total budget of study time) is spent by cadets in study groups using traditional technology, which is not enough to form a cadet leader.

In this regard, it is of interest to study the possibility of using interactive teaching methods in the educational process in the course of tactical and special disciplines based on leadership [19,20]. Currently, there are three main areas of leadership concepts [21]:

1. Concepts that substantiate the superiority of the factor of personality traits.
2. Concepts in which the situation is considered the decisive factor.
3. Concepts that combine personal and situational factors.

The chosen course of Ukraine's accession to NATO, and thus the need to reform the system of higher military education in line with NATO member states, is evident in a study under the scientific guidance of the Director of the Department of Military Education and Science of the Ministry of Defense of Ukraine [22] to substantiate a promising model of the military education system of Ukraine. Although the publication does not mention training complexes, they are actively used by NATO member states in their military education systems to train air force pilots (navigators). We are also concerned about another problematic issue: "Is it possible to train a leader in the educational process of a higher military educational institution?"

Highlighting aspects that are understudied

Despite the study of the subject of research, it should be

recognized that the problem of the quality of training of military specialists for the needs of communication and cybersecurity units is not reflected in the reviewed publications at all. Based on this, the author chose this topical area of research to improve the educational process at the Department of Combat Use of Communication Units in combination with the methodology of professional-business game for the development of a cadet leader in professional training courses (L-1B) of the tactical level of military education.

The purpose of the study is to substantiate the conceptual view of the department in the need to build a computerized training complex for the training of leadership officers in professional training courses (L-1B) of the tactical level of military education, capable of using communication units on the basis of a computer game.

Purpose of the article

The purpose of the article is to substantiate the conceptual view of the department in the need to build a computerized training complex for training officers of leaders in professional training courses (L-1B) of the tactical level of military education, capable of using communication units based on computer games.

Objectives (goals) and research methods

To achieve this goal, the following tasks were set:

1. To analyze the current state of development of the subject and object of research.
2. To substantiate new solutions, namely the concept of a professional business game in the training of communication and cybersecurity officers based on leadership and a computerized training complex.

To achieve the goal outlined in the article, we used the basic tools of scientific research according to the following algorithm:

At stage 1, theoretical historical analysis and generalization were used to analyze the scientific literature (including Internet sources by keywords), which allowed us to find out the level of development of the chosen topic, which aspects have been studied before, and which insufficiently studied aspects should be highlighted;

At stage 2, the synthesis method was used to combine individual fragments and ideas, which resulted in the development of the concept of a professional business game for future communication and cybersecurity officers based on leadership with elements of game mechanics of a computerized training complex;

At stage 3, the results of the study were discussed and summarized, and the results (conclusions) and recommendations for further research were summarized;

At stage 4, the level of scientific novelty of the research result was formed by the method of analytical and comparative analysis.

Reliability and accuracy of results

In our opinion, the reliability of the research results is ensured:

A logical algorithm for using scientific research methods;

A reasonable choice of the basic assumptions and limitations taken as initial ones when formulating the formulation of partial scientific tasks.

The reliability and validity of the conclusions and recommendations are confirmed:

The results of virtual modeling of pedagogical phenomena and processes;

The logic of psychological, pedagogical, and organizational decisions;

Clear scientific interpretation that does not contradict known (published) data.

Limitations in the application of the results

It is important to eliminate any potential biases by focusing on the Ukrainian context, which will provide a more balanced view of the problem. Therefore, the use of the findings in other countries may be considered as one of the possible options at the preliminary analysis stage.

One should also take into account the warnings about the gamification process based on the results of the numerous risks identified in media practice [23] and the possible development of gambling addiction, as evidenced by the results of studies [24].

The consequences of cybersecurity at departmental critical information infrastructure facilities from the gaming addiction of fully cybersocialized military personnel were reviewed in [25]. Similar studies have been conducted for other categories [26]. Depending on the intrinsic motivation of cybersocialized servicemen, the transition of the human state from the defender to the side of the offender - the insider is not included, which is clearly demonstrated in Figure 1 [25,p.84], as a portrait of a participant in cyber confrontation [27]. It is precisely because of the likelihood of a serviceman's transformation from a defender to an insider that it is necessary to study their motivational characteristics when applying for admission to cyber confrontation [28].

Results and discussion

The resumption and actualization of scientific research is due to a change in the approach to combat training of military specialists of the communication units of the Armed Forces of Ukraine. The way of reforming combat training on the basis of computer-based learning can be considered an innovative view of the time. After all, Ukraine is reforming its Armed Forces, and military education and science along with them. Foreign experience, which is studied and implemented by specialists, helps a lot in this process [29]. Increasingly, interactive and computer-based learning technologies are being introduced into the educational process of Ukraine's military universities, which were not present in the traditional system of officer training. It should also be noted that the results of the war make it necessary to update not only the requirements for the professional competencies of officers in



Figure 1: An example of a teacher conducting a professional and business game with cadets in their roles as officers.

the security and defense sector but also the search for effective teaching methods [30].

Role-playing professional business games are considered to be one of the most effective methods of practical training of officers. Their peculiarity lies in taking into account the military-practical orientation of cadets' training and the predominance of the creative style of behavior of the participants. Let's try to combine a business role-playing game with gamification. To do this, we will build conceptual ideas of gamification, namely, methods of teaching military and professional disciplines at the Department of Combat Use of Communication Units with the use of a computerized training complex:

- 1) Dynamics (use of game military-historical scenarios that require increased attention and adequate reactions from cadets);
- 2) Mechanics (use of scenario elements, such as virtual awards, and statuses);
- 3) Aesthetics (reproduction of an unrivaled gaming experience for cadets, which promotes emotional motivation);
- 4) Social interaction (a wide range of techniques that ensure cadets' interaction).

The hope for gamification is that it will be the driving force behind influencing the cadets' response, namely:

Cognitive sphere: A military history computer game must include a well-thought-out system of rules for cadets; facilitate the simulation of specific problem situations that may arise on the battlefield, adapted to the tactical level of qualification of future officers of the security and defense sector; gradually increase the complexity and contribute to the acquisition of relevant skills by cadets. The content and organization of the military-historical computer game allow cadets to choose an individual route and command decision, which allows them to give orders in the role of a future commander to solve partial tactical goals by personnel in the context of the overall strategic task;

Emotional sphere: Taking part in the game on the computerized training complex allows cadets to feel and experience

various emotions from joy, and pride in the success achieved in gaining an advantage over the enemy to the disappointment of losing their comrades. In order to acquire new knowledge, a cadet at a certain stage of a military history computer game has to experience the excitement of failure. While playing on a computerized training complex, cadets naturally change their attitude to their own mistakes, for incorrectly assessing the situation and the state of the unit and the prepared report, etc;

Social sphere: The content of the military-historical computer game on the computerized training complex, and its organization, in our opinion, will motivate cadets to perform new roles and make command decisions. Playing in a team, each cadet performs certain official roles (functions), in the virtual space of the game has the opportunity to form his own readiness for future military and professional activities as a commander of a communication unit through mistakes.

The reproduction of military-historical events through a computer game on a computerized training complex has certain rules, which oblige all its participants to adhere to certain sequences, analysis, and selection of response algorithms depending on the changing conditions of the tactical situation deployed on the virtual battlefield [31]. In this way, it is achieved in a certain way that cadets find themselves in situations as close as possible to their real future professional activities as officers. During such classes, a combat situation is simulated in the classroom, in "extreme conditions", during which future officers, tactical level specialists, are trained to perform their duties with maximum adaptation immediately after graduation.

The concept of a computerized training complex for training military specialists in the use of communication units based on a computer game takes into account the phenomenon of the game, the essence of which is that, being entertainment, and recreation, it can turn into learning, creativity, a model of the type of human relations and manifestations in work.

The structural diagram of the functional dependence of the interaction of participants in the educational process when using gamification on a computerized training complex is shown in the following figure (Figure 2). It is based on the cybernetic approach described in [32]. It should be noted that its implementation for

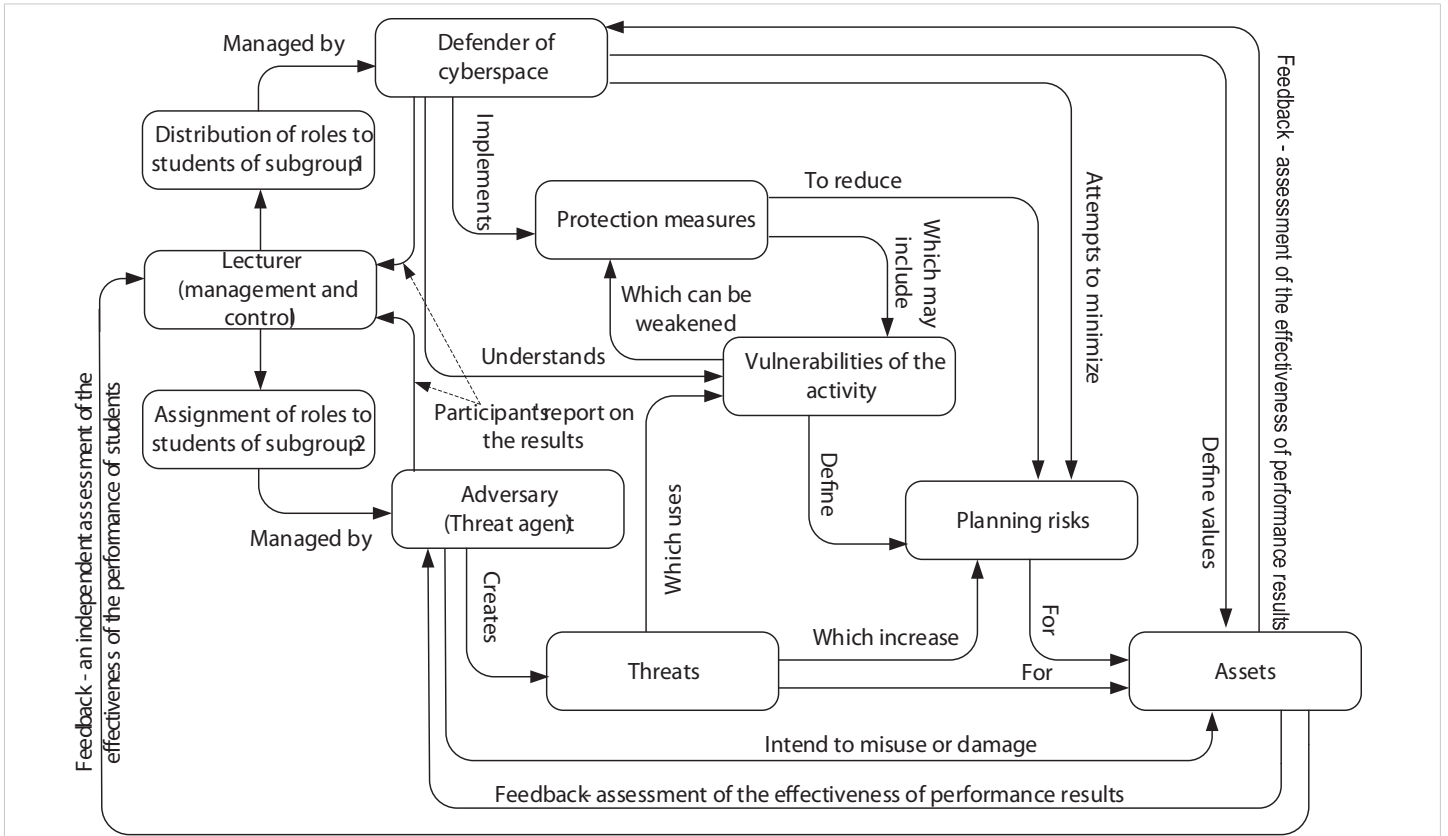


Figure 2: Flowchart of functional dependence of interaction (gamification) of participants of the educational process on a computerized training complex.

training future military specialists in the use of communication units is as follows.

The teacher divides the cadets of the training group into two groups (defenders and offenders).

The offender side or “Threat Agents” create destructive influences.

Military specialists (the defenders) must formulate training professional command decisions in the game that would neutralize the destructive effects created by threat agents.

In the present study, it is proposed to consider the game from the perspective of a teaching method. In this case, the method of the pedagogical game will be widely used in the development of the art of war and thus will help cadets acquire professional skills.

Practical aspects of implementation

To create a computerized training complex, we propose that software developers be involved in writing a game strategy of well-known military and historical events, taking into account the possible actions of communication units. Conventionally, the strategy of a computerized training complex can be represented by the example of a training game in cyberspace [33], and visually in the form of the following Figure 3.

Its emulation, as a computer game, is rationally used in the

training of military specialists to consolidate theoretical knowledge by acquiring primary practical skills [31]:

- ☑ Fulfillment of official functional duties of commanders of communication units of the tactical level of management of their daily activities;
- ☑ Working out the algorithm of decision-making by the commander;
- ☑ Performing engineering actions, namely:
- ☑ Designing communication lines;
- ☑ Deployment of ICN components as part of the crew for a period of time;
- ☑ Practicing (remote) configuration of ICN elements (firewall, routers, programming of equipment settings) (Figure 4);
- ☑ Fulfillment of virtual training standards and tasks in the training of military cybersecurity specialists.

This virtualization in the initial practical training will maximize the safety of the ICS telecommunication equipment in the event of erroneous actions of the trainees. At the same time, the cadets will have a clear example of what can happen to the ICS telecommunications equipment in the event of their incorrect or erroneous actions.

Game virtualization of ICS telecommunication equipment

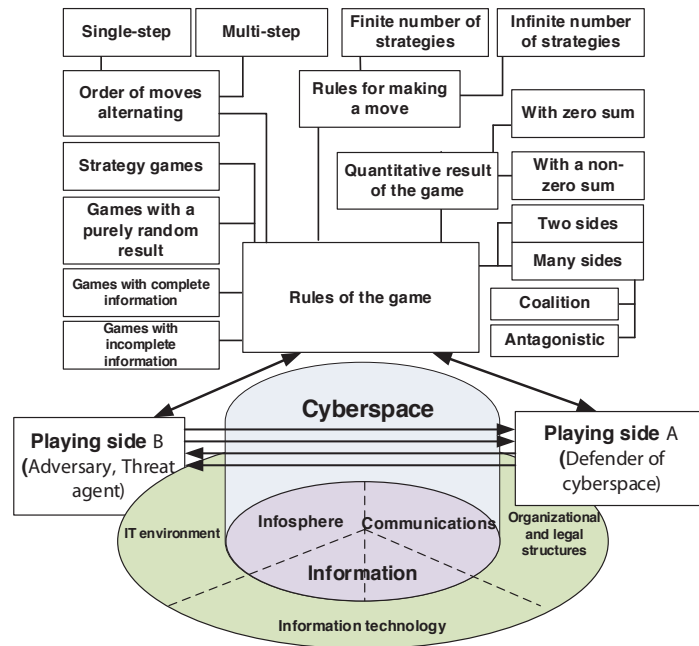


Figure 3: A model of confrontation in cyberspace taking into account the classification of game theory (draft layout).

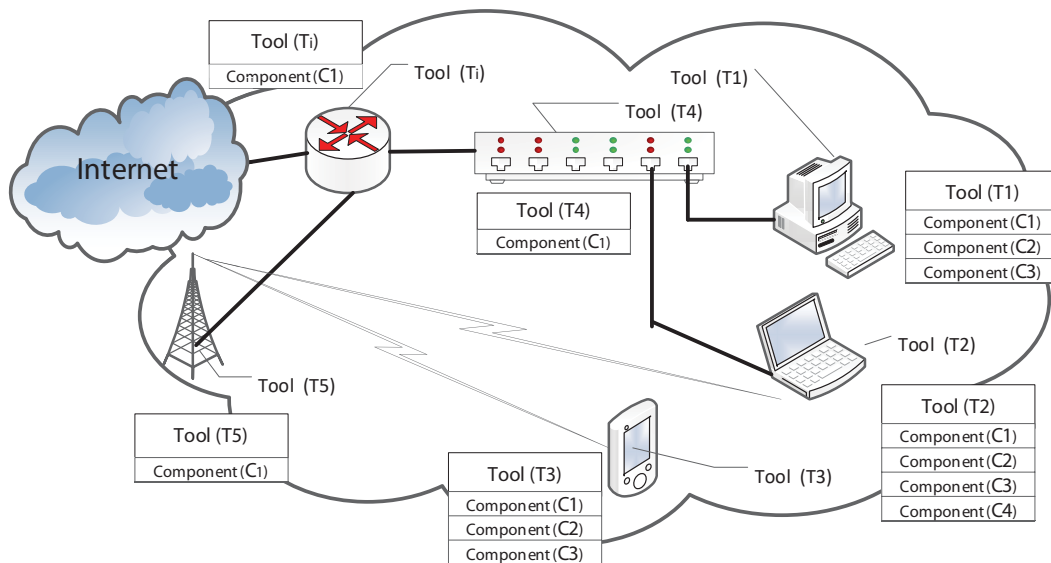


Figure 4: A fragment of a conditional educational information system (draft layout).

will allow a military specialist to simulate their own actions, help them understand the sequence of elementary actions, study different types of network structure, understand the intent of ICS deployment, its protection in accordance with their sector of responsibility, and develop creative ideas to find new contextual algorithms for implementing cybersecurity.

To increase the information about ICS, it is advisable to develop a model at the department to demonstrate the elements of combat use of ICS deployment by communication units and subunits on the example of the developed three-dimensional animated model of ICS.

A virtual 3D model of the ICS can be made in the Unity computer game development environment. The virtual 3D model can be controlled through the information desk, which allows you to control the display screen while immersed in a three-dimensional model (Figure 5). To create the effect of augmented reality, 3D virtual reality headsets are used, controlled from a smartphone that has a program with a 3D model downloaded. The use of three-dimensional technologies allows cadets to fully “immerse” themselves in the location of the ICS and, sequentially passing through its elements deployed on the ground, to familiarize themselves with their description, as well as in the mode of a



Figure 5: Elements of the virtual 3D part of the interactive layout (draft layout).

virtual guide with a description of what they saw on the model, “excursion” through the I ICS.

This 3D model will provide cadets with a variety of functionalities to get acquainted with the organizational and technical structures of field ICS and the placement of their elements on the ground, which corresponds to what is shown on the natural model.

The activity of the teacher gives way to the activity of the cadets. His task is to create conditions for their initiative of cognitive activity. The teacher abandons the role of a mere translator of ready-made knowledge and performs the function of one of the sources of information and assistant in the work, which organizes the independent cognitive activity of cadets to produce knowledge about the surrounding reality, which encourages search, research of phenomena and processes, independent problem-solving.

A large budget of time allocated for independent work will allow cadets to deeply study the educational material, prepare for the class and ultimately gain professional experience in their future activities. The success of cadets in learning depends on the time spent on extracurricular activities [34] with the use of assistive technologies [35], in this case, the use of gamification.

This set of measures creates favorable conditions under which the cadet while learning in a computer game, does not even suspect that he is learning something. In traditional learning, it is easy to identify the source of knowledge. In a computer game, there is no source of knowledge that can be easily recognized by the cadets. The learning process develops in the language of actions as a result of active contact between cadets and each other and becomes unobtrusive.

After consolidating the knowledge gained and gaining “experience”, students can be offered “bonuses” in the form of small arms shooting (Figure 6), as an alternative to the quest room for learning and relaxation [36]. It should be noted that the multimedia interactive laser shooting range “Simulator-T1” is suitable for teaching students in the reserve officer training

program, training and assessing the level of training of personnel in the techniques and rules of small arms firing, is used for both individual and group training and allows you to practice training exercises in accordance with the current “Shooting Course”.

To enhance the training of cadets, the military department offers the acquisition of skills in handling samples of small arms (PM, AK, RKK, PKM, SGD), flamethrowers RPV-16, grenade launchers (GP-25, RPG-7, RPG-22, AGS-17, SPG-9). “The T1 simulator has a mode for conducting individual and group training shootings and competitions between several participants.

The introduction of this type of training in the educational process allows for the enhancement of cognitive processes, simplifies the curriculum itself, and directs the learning time to subjects and disciplines that require a good understanding by students. In addition, S. Riley and G. McCabe positively endorse a system of reflective learning and assessment for teachers and students to co-create experiential learning that is scalable and effective [37]. The co-creation of curricula by teachers and students is disruptive, and challenging traditional models of learning, but it is motivating and engaging and can stimulate change to improve the education system and non-formal education.

To implement the acquisition of leadership qualities by cadets, a professional course of the tactical level L1B in the discipline is held: Combat use of military communication systems and complexes of the course of professional military education, the teacher manages the educational process in the format of a professional business game [38]. The distribution of positions of tactical command officers and subordination in a professional business game is shown in Figure 7 for clarity.

Figure 1 is an example of an instructor conducting a professional and business game with cadets in their roles as officers according to the structure presented in Figure 7.

The first practical training sessions confirmed the assumption that the proposed professional business game helps cadets gain

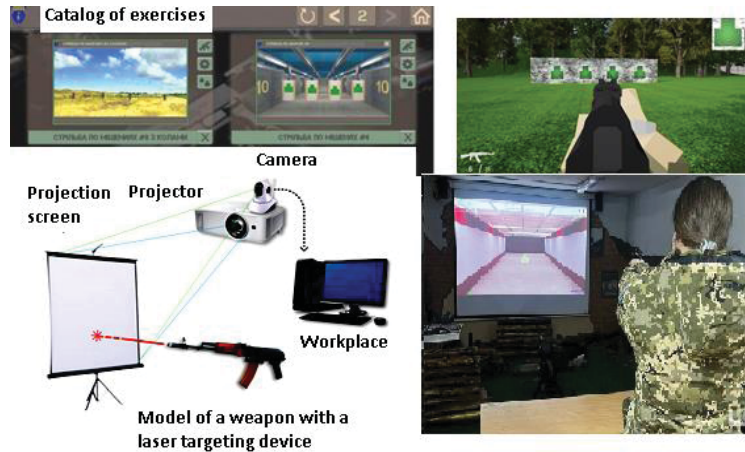


Figure 6: Virtual shooting range (draft layout).

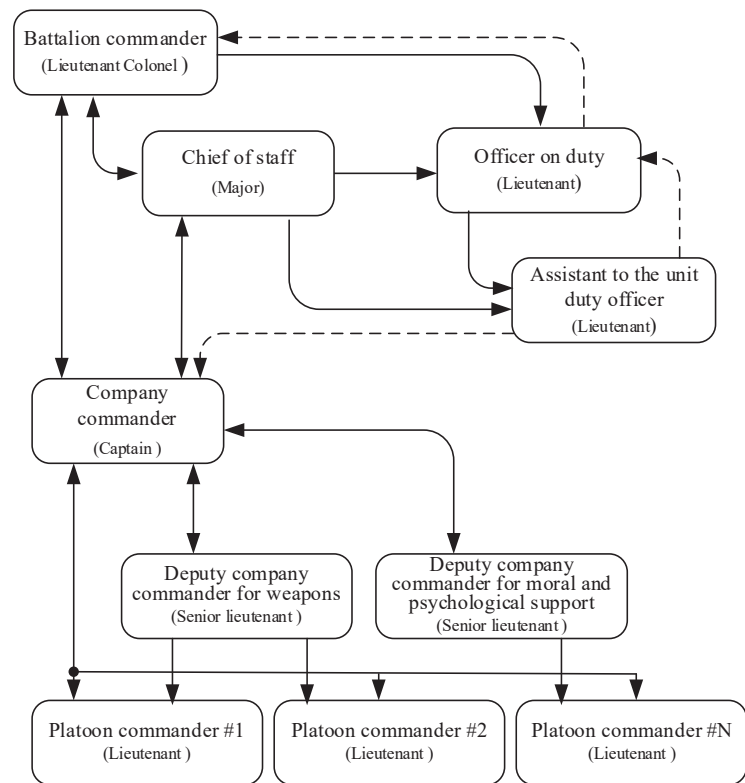


Figure 7: Distribution of positions of tactical command officers and subordination in a professional business game.

initial experience, and develop a sense of responsibility, discipline, activity, and leadership initiative.

Predicted evaluation of effectiveness. The predicted evaluation of effectiveness is based on the statistical data in Table 1 since only the method of teaching based on didactic games is most conducive to the formation of practical experience [31].

The initial survey of cadets showed that during the professional and business game they began to feel the attitude of teachers not as cadets but rather as future officers.

Of course, it has long been known that every leader has his

or her own path. Copying the leadership behavior of others will not lead to the emergence of your own [39]. We emphasize and emphasize that leadership can be considered an art based on the officer's life and professional activity, creative attitude to military professional activities, and the realization of his/her official competencies. At the same time, the sources of this art are hidden within the individual philosophy of the officer as a subject of an extreme type of activity.

The formation and development of leadership competence of each serviceman are based, on the one hand, on his experience, in particular, service experience and, most of all, combat experience, and, on the other hand, on career advancement [40,41].

Table 1: Comparative characteristics of different teaching methods.

Teaching methods		Solved tasks						Gaining experience
		Form		Develop				
		knowledge	skills	thinking	memory	language		
Practical	Working with a book (reading)	10%	+	+	+	+	+	
	Educational discussions	50%	++	-	++	+	++	++
	Didactic games	70%	++	-	++	+	++	++
	Practical training	75%	+	++	++	+	-	++
	Teaching others is the application of what has been learned	90%	++	-	++	+	++	++
Independent work		80%	++	++	++	+	+	
Oral and written control			++	-	+	+	++	

Note: ++: Solve very well; +: Solve partially; -: Solve poorly.

Officer training at NATO educational institutions is aimed at acquiring exclusively military professional competencies through leadership courses (L1-L4) without reference to a specific position but linked to military ranks. The uniqueness of the officer training system in the Republic of Latvia, Lithuania, and Estonia is that in addition to leadership L-courses, there are specialized advanced training courses that provide for the acquisition of a military specialty or qualification and help to improve the performance of their duties. [42,c.31]. Unlike NATO educational institutions, in our concept of HMEIs, officer training is carried out with a national characteristic [38]. This difference lies in the inclusion of bachelor's and master's degrees in civilian fields of knowledge, and basic training courses L-1A and L-1B in the educational and professional program [40]. But the highlight is the professionally oriented teaching using the technology of professional table games. After successful completion of the training, the graduate will be able to occupy primary positions (platoon leader, deputy company commander).

The Order of the General Staff of the Armed Forces of Ukraine [43] is used to assess the level of authority and leadership of future commanders (chiefs) at the coffee house [38] and its adaptation is discussed in [38].

Thus, the gradual implementation of the department's innovations realizes the motto "interesting and easy to learn - professional and easy in modern hybrid combat"! [38,44].

Prospects for further research

This study does not fully exhaust all aspects of the problem. Prospects for further research should be focused on substantiating the terms of reference for the development of computer software for playing in cyberspace.

From the future scientific perspective, in the professional course of the tactical level of professional military education (L-1B), in the discipline "Combat use of military communication systems and complexes", on the basis of leadership, to organize a scientific and pedagogical experiment for a detailed assessment of the effectiveness of the developed computerized training complex.

Conclusion

It is not the simple use of a computer game but a computerized training complex in the training of communication and cybersecurity officers that helps to develop interest in military

equipment and improve communication skills that can be transferred to simulators. The skills acquired during classes at the computerized training complex will be useful to cadets in their future military and professional activities as officers. At the same time, we need to be careful about the use of gamification. It is clear that the spirit of competition encourages cadets to complete tasks faster and better, but if one of the participants gets a result that is much better than the leaders, then under certain conditions this person may lose heart and decide that there is no point in studying, and anti-motivation sets in.

The scientific novelty of the work. For the first time, it was proposed in the concept of the department's development to build an educational process of leadership development for communication and cybersecurity officers in professional training courses (L-1B) of the tactical level of military education using a professional business game and a computerized training complex.

The scientific result expands the boundaries of pedagogical sciences in the field of higher military education, adding innovative elements of game mechanics, transforming group classes in the traditional form of education into an active professional business game in which cadets gain primary experience in future positions of officers and train to make decisions in typical and atypical (force majeure) training environments of everyday activities.

Acknowledgment

The author would like to express her gratitude for the financial support provided by the scientific journal for free printing as an intention of a civilized society to support researchers from Ukraine who bravely continue their research despite the war. Sincere thanks to the editorial board.

Declaration of interest

The author declares that he has no known competing financial interests or personal relationships that could influence the work presented in this article.

References

1. Saifetdinov KhI. Reforming combat training: computer forms of training. *Military Thought*. 1998; 36: 77–81.
2. Krasnyk YaV, Popovych TD, Krasnyk MYa, Hozuvatenko HO. Substantiation of directions of development of training means of Rocket Troops and artillery of Ground Forces. *Military-Technical Collection*. 2009; 1: 94–102.

3. Bepaliekho VP. Programmed learning. Didactic foundations. Moscow: Higher School. 1970.
4. Description of the outline, structure, and purpose requirements for the unified simulator-modeling complex and its components. Research report (intermediate). Scientific center of artillery. Sumy. 2002; 3565: 181.
5. Rusnak IS, Shevchenko VL. Problems of modernization and creation of military training and modeling complexes. *Science and Defense*. 2002; 1: 32–39.
6. Volkova NP. Gamification as one of the trends of modern higher education. *Modern higher education: problems and prospects. VI All-Ukrainian Scientific and Practical Conference of students, postgraduates, and scientists. Dnipro*. 2018; 33-35.
7. Kozubtsov IM. The concept of independent training of cadets of the ground forces on training facilities by playing on a virtual computer. Prospects for the development of weapons and military equipment of the ground forces. *Collection of abstracts of the second All-Ukrainian Scientific and Technical Conference. Lviv*. 2009; 77.
8. Buhaieva VYu. Gamification as a way of forming active professional behavior of future IT-industry specialists. *Pedagogy and Psychology*. 2018; 56: 129-135.
9. Tkachenko O. Gamification of education: formal and informal space. *Current Issues of the Humanities*. 2015; 11: 303–309.
10. Tseas K, Katsioulas N, Kalandaridis T. Gamification in higher education. M.S. Thesis, Dept. Electrical and Computer Engineering, University of Thessaly. Volos, Greece. 2014.
11. Deterding S, Dixon D, Khaled R, Nacke L. From game design elements to gamefulness: Defining gamification. In *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*. 2011; 9-15.
12. Kapp K. *The gamification of learning and instruction game-based methods and strategies for training and education*. San Francisco, USA: Pfeiffer. 2012.
13. Nahl D, James L. Gamification in Instruction and the Management of Intersubjectivity in Online University Courses. *International Journal of Web Portals*. 2013; 5; 2: 48–62.
14. Petrenko SV. Gamification as an innovative educational technology. *Innovation in education*. 2018; 7: 177-185.
15. Rybka NM. Graization and experience of using computer games in teaching philosophy in technical institutions of Higher Education. *Information Technologies and Training Tools*. 2018; 5: 213–225.
16. Kaufmann DA. Reflection: Benefits of Gamification in Online Higher Education. *Journal of Instructional Research*. 2018; 7:125-132.
17. Baranovska LV. Personality-oriented approach to the professional training of future officers of tactical level military command. Thesis for the degree of Candidate of Pedagogical Sciences in the specialty 13.00.04 - Theory and Methods of Vocational Education. Zhytomyr: Zhytomyr Ivan Franko State University. 2014; 22.
18. Agayev NA, Kokun OM, Pishko IO, Lozinska NS, Gerasimenko MV, Tkachenko VV. Psychological support for the development of leadership qualities of future officers: Methodological manual. Kyiv: Research and Development Center of the General Staff of the Armed Forces of Ukraine. 2014; 209.
19. Kozubtsov I. Problems of failure of the existing model of personnel management of the armed forces of Ukraine in the conditions of external military aggression. The 1st International Scientific and Practical Conference “Law and Public Administration – New Development Trends” «LPA–NDT». Ukraine-Iraq-Poland. 2022; 22–24.
20. Ostapchuk VM. Choosing a military profession by modern youth: a conscious decision or an accident? *Society. State. Army. Collection of scientific papers (Humanities and socio-economic sciences)*. 2022; 26: 4–7.
21. Kokun OM. Psychological structure of leadership qualities of the future officer. *Bulletin of the National Defense University of Ukraine*. 2012; 4 (29): 170–174.
22. Rusnak I, Mirnenko V, Kas'ianenko M, Oliferuk V, Viter D. Innovative military education: state and prospects of development. *Collection of scientific papers “Military Education”*. 2021; 2 (44): 9-20.
23. Fedotova NA. Opportunities and risks of gamification in media practice. *Sign: problem field of media education*. 2018; 4(30): 54–59.
24. Chaika GV. The influence of computer games as a new factor of culture on the formation of personality. *Actual Problems of Psychology*. 2006; 3: 218-296.
25. Kozubtsova LM, Kozubtsov IM, Tereshchenko TP, Bondarenko TV. On the cyber security of playing geolocation games by military personnel while at departmental critical information infrastructure facilities. *Electronic professional scientific publication “Cybersecurity: Education, Science, Technology”*. 2022; 17: 76–90.
26. Khlaponin YI, Lukyanchuk YA, Kozubtsova LM, Kozubtsov IN. Igromania as a factor of violation of personal and departmental cybersecurity by employees of critical infrastructure facilities. *Scientific and Practical Cyber Security Journal (SPCSJ)*. 2022; 6(2): 30–37.
27. Kozubtsov IM. On the motivational portrait of participants in cyber confrontation. *Actual problems of science and technology development: Materials of the first international scientific and technical conference. Collection of abstracts*. Kyiv: DUT. 2015; 208-211.
28. Kozubtsov IM, Kozubtsova LM, Zhyvylo EO, Kutsaev VV. On the need to study the motivational characteristics of military personnel when they are allowed to engage in cyber confrontation. *Scientific and Practical Conference “Application of Information Technologies in the Training and Activities of Law Enforcement Forces”*. Kharkiv: National Academy of the National Guard of Ukraine. 2016; 35-36.
29. Kozubenko O. New training methods allow young officers to immediately perform their official duties. *Army Inform News Agency, Ministry of Defense of Ukraine*. 2021; <https://armyinform.com.ua/2021/05/18/novi-metodykynavchannya-dozvoliyayut-molodym-oficzeram-odrazu-vykonuvaty-posadovi-obovyazky>.
30. Didenko O, Kozubtsov I. Professional requirements for officers of the security and defense sector forces. *Collection of scientific papers of the National Academy of State Border Service of Ukraine*. 2022; 3(30): 180–197.
31. Kozubtsova LM, Kozubtsov IM, Lishchyna VO, Shtanenko SS. Concept of the training complex for training military information and cybersecurity specialists based on computer games (gamification). *Electronic professional scientific publication “Cybersecurity: Education, Science, Technology”*. 2022; 18: 49-60.
32. Kozubtsov IM. Cyber ontological approach in professional training of future teachers of higher education institutions: theory and practice. *Adult education: theory, experience, prospects: collection of scientific hands*. Ivan Zyazyun Institute of teacher education and adult education of the National Academy of Pedagogical Sciences of Ukraine. 2022; 2: 87–97.
33. Kozubtsov IM, Kozubtsova LM. Strategy of the game in cyberspace. *Proceedings of the International Scientific and Technical Conference “Modern Information and Telecommunication Technologies”, Volume III Development of information technologies*. Kyiv. 2015; 52–54.
34. Sharma N, Appukutti Sh, Garg U, Mukherjee J, Mishra S. Analysis of Student's Academic Performance based on their Time Spent on Extra-Curricular Activities using Machine Learning Techniques. *International Journal of Modern Education and Computer Science (IJMECS)*. 2023; 15; 1: 46–57.
35. Adebayo EO, Ayorinde IT. Efficacy of Assistive Technology for Improved Teaching and Learning in Computer Science. *International Journal of Education and Management Engineering (IJEME)*. 2022; 12; 5: 9-17.
36. Montagu-Cairns S. You wake up in a locked room... Using digital escape rooms to promote student engagement. *Times Higher Education*. 2023; <https://www.timeshighereducation.com/campus/you-wake-locked-room-using-digital-escape-rooms-promote-student-engagement>

37. Riley S, McCabe G. Enabling staff-student co-creation of experiential learning at scale. *Times Higher Education*. 2021; <https://www.timeshighereducation.com/campus/enabling-staffstudent-cocreation-experiential-learning-scale>.
38. Kozubtsov I. Methodology of the Professional-Business Game for the Development of a Cadet Leader in Professional Training Courses (L-1B) of the Tactical Level of Military Education. *gMin Res*. 2023; 1(2): 160–169. DOI: 10.61927/igmin132.
39. Boyko OV. Theory and methods of formation of leadership competence of officers of the Armed Forces of Ukraine: monograph. Zhytomyr: O. O. Yevenok Publishing House, 2020.
40. Mitiahin O. Education and individual training in NATO countries. *Collection of Scientific Works "Age Education"*. 2021; 2(44): 131-143.
41. Saienko O, Kozubtsov I, Stupenkov S, Lohvinenko N. *Military Pedagogy and Psychology (including Leadership)*. Kyiv: VITI. 2023.
42. Bohunov S, Chernykh O, Chernykh Yu. Organization of Officer Training for the Armed Forces of the Republic of Latvia. *Collection of Scientific Papers "Age Education"*. 2019; 1(39): 29-42.
43. Instruction on Assessing the Level of Authority and Leadership of Commanders (Chiefs) in the Armed Forces of Ukraine: Order of the General Staff of the Armed Forces of Ukraine. 2018; No 249.
44. Syrotenko AM, Bohunov SO, Prykhodko YuI. Innovations in the system of training military specialists with higher education: concept, essence, orientation. *Science and Defense*. 2018; 3: 38–46.

How to cite this article: Kozubtsov I, Nesterov O. The Conceptual View of the Department of Combat use of Communication Units on the Creation of a Training Game Complex for Training Military Specialists on the Basis of Leadership. *IgMin Res*. Feb 07, 2024; 2(2): 048-058. IgMin ID: igmin145; DOI: 10.61927/igmin145; Available at: www.igminresearch.com/articles/pdf/igmin145.pdf