



# **ARTIFICIAL INTELLIGENCE AS A MEANS OF DEVELOPING PROFESSIONAL COMPETENCIES OF MILITARY CADETS**

D. T. Pulatov

Senior Lecturer at the Institute of Military  
Aviation of the Republic of Uzbekistan

## **Abstract**

The article examines the potential of artificial intelligence as a means of developing the professional competencies of military cadets within the system of modern military education. The relevance of the study is обусловed by the digital transformation of the educational environment, the increasing complexity of military training tasks, and the need to develop in cadets analytical thinking, readiness to make decisions under conditions of uncertainty, the ability for independent learning, and effective work with information. The purpose of the article is to provide a theoretical substantiation of the possibilities of applying artificial intelligence technologies in the process of forming the professional competencies of military cadets. The study employed methods of scientific literature analysis, a comparative pedagogical approach, generalization of contemporary practices in the digitalization of education, and system analysis. The results show that artificial intelligence contributes to the personalization of learning, increases the objectivity of assessing academic achievements, and promotes the development of situational analysis skills and the modeling of professional actions. It is demonstrated that artificial intelligence shows the greatest effectiveness when integrated into simulation-based, adaptive, and analytical educational environments. It is noted that the application of these technologies requires consideration of pedagogical, organizational, ethical, and information security limitations. It is concluded that artificial intelligence should be regarded not as a substitute for the teacher, but as an intelligent tool that enhances the quality of professional training for military specialists.

**Keywords:** Artificial intelligence, military education, military cadets, professional competencies, digitalization of education, adaptive learning, analytical thinking, modeling, decision-making.



## **Introduction**

The contemporary stage of social development is characterized by large-scale digital transformation in virtually all areas of professional activity, including education and military training. Artificial intelligence is becoming one of the most significant factors in the modernization of educational systems, as it expands the possibilities for data analysis, individualized learning, outcome prediction, and the modeling of complex professional situations. In military education, this issue acquires special significance due to the increasing demands placed on the quality of cadet training, the need for rapid mastery of large volumes of information, and the development of readiness to act under rapidly changing conditions.

The training of military cadets is a multilevel pedagogical process aimed at developing not only specialized knowledge and practical skills, but also the personal qualities necessary for professional military service. Among these, discipline, stress resistance, responsibility, the ability to analyze situations promptly, and decision-making under conditions of risk and time pressure occupy a special place. In this regard, the use of artificial intelligence technologies in the educational process can serve as an effective instrument for improving the quality of military professional training.

Despite the growing interest in the use of artificial intelligence in education, issues related to its application in the training of military cadets remain insufficiently developed from a pedagogical perspective. A more detailed understanding is required of how intelligent digital technologies can contribute to the development of the professional competencies of future military specialists, what pedagogical conditions are necessary for their effective use, and what risks should be taken into account when implementing such solutions in educational practice.

The purpose of the study is to provide a theoretical substantiation of the possibilities of using artificial intelligence as a means of developing the professional competencies of military cadets.

The objectives of the study are as follows:

1. to clarify the essence of the professional competencies of military cadets in the context of contemporary military education;



2. to determine the didactic potential of artificial intelligence in the educational process;
3. to identify the main directions of the influence of artificial intelligence on the development of cadets' professional competencies;
4. to characterize the pedagogical conditions and limitations of the effective implementation of artificial intelligence in the system of military education.

### **Materials and Methods**

The methodological foundation of the study was formed by the competency-based, systemic, and activity-based approaches, the application of which made it possible to comprehensively examine the problem of using artificial intelligence in the development of the professional competencies of military cadets. The competency-based approach was used to analyze the professional training of cadets through the prism of forming a complex of knowledge, skills, abilities, and personal qualities necessary for the successful performance of service-related professional tasks. This approach made it possible to focus not only on the content of instruction, but also on the final outcomes of the educational process, expressed in the readiness of the future military specialist for effective practical activity.

The systemic approach ensured consideration of artificial intelligence as a component of the integral educational environment of a military higher education institution. Within the framework of this approach, the process of forming the professional competencies of cadets was analyzed as a complex, multi-component, and interrelated system including educational goals, training content, pedagogical technologies, digital tools, forms of assessment, and expected outcomes. This made it possible to identify the place of artificial intelligence in the general structure of military professional training and to determine its functional capabilities in the modernization of the educational process.

The activity-based approach was applied to identify the influence of digital intelligent tools on the nature of the educational and quasi-professional activities of cadets. Its use made it possible to consider the cadet not only as an object of pedagogical influence, but also as an active subject of educational activity involved in solving academic, analytical, tactical, and situational tasks. From this point of view, artificial intelligence was regarded as a means of organizing active



cognitive activity, promoting the development of independence, reflection, and the ability to analyze, model, and make decisions.

In the course of the study, a set of complementary theoretical methods was used. First of all, the method of analysis and synthesis of scientific literature on the problems of education digitalization, the use of artificial intelligence in learning, and the development of professional competencies was applied. This method made it possible to examine the degree of elaboration of the problem under consideration in contemporary pedagogical science, to identify the main approaches to defining the essence of artificial intelligence in the educational environment, and to generalize existing scientific ideas about the content of military cadets' professional training.

A comparative pedagogical analysis of domestic and foreign approaches to the use of intelligent technologies in education made it possible to establish similarities and differences in the interpretation of the didactic possibilities of artificial intelligence, to identify the most productive areas of its application, and to determine those aspects that can be adapted to the military education system. Particular attention was paid to the issues of personalized learning, automated assessment of results, simulation modeling, and the development of stable decision-making skills among learners.

The method of systematization and generalization of scientific provisions was used to structure theoretical material related to the application of adaptive, analytical, and simulation technologies in military training. On the basis of this method, the key directions of the influence of artificial intelligence on the development of cadets' professional competencies were identified, and the main pedagogical conditions for its effective integration into the educational process were formulated.

An important place in the study was occupied by the method of theoretical modeling, which made it possible to determine the main directions of using artificial intelligence in the development of the professional competencies of military cadets. With the help of this method, a generalized model of the pedagogical potential of artificial intelligence in the military education system was formed, including such components as adaptation of training content, intellectual support of learning activity, modeling of professional situations, analytical assessment of training results, and support of cadets' independent work.



The empirical basis of the theoretical analysis consisted of scientific publications devoted to artificial intelligence in education, the digital transformation of the educational environment, pedagogical aspects of military professional training, as well as international analytical materials reflecting current trends in the integration of intelligent technologies into learning. The analysis of these sources made it possible to establish that under modern conditions artificial intelligence is increasingly regarded as an effective tool for improving the quality of education, expanding the possibilities of pedagogical interaction, and forming competencies in demand in professional activity.

### **Theoretical Foundations of the Study**

#### **Professional Competencies of Military Cadets as a Pedagogical Category**

In modern pedagogical science, professional competence is understood as an integrative quality of the individual expressing his or her readiness and ability to carry out professional activity effectively on the basis of a combination of knowledge, practical experience, value orientations, and developed personal qualities. Unlike the narrow understanding of professional training as the assimilation of a certain amount of educational information, the competency-based approach orients the educational process toward achieving a more complex result, including the ability to apply knowledge in practical situations, make independent decisions, and bear responsibility for their consequences.

In relation to military education, the concept of professional competence acquires a special specificity conditioned by the nature of military service, the high degree of responsibility, the normative regulation of activity, and the need to act under conditions of increased risk and uncertainty. The training of a military cadet cannot be limited only to the transmission of theoretical knowledge or the practice of individual practical skills. It presupposes the formation of integral professional readiness including intellectual, operational, motivational, value-based, and behavioral components.

The professional competencies of military cadets encompass a system of specialized military-professional knowledge, practical skills and abilities for performing service tasks, developed analytical thinking, the ability to make prompt and responsible decisions, readiness to act under conditions of uncertainty, teamwork skills, information and digital literacy, as well as stable



motivation for professional self-development. Each of these components has independent significance; however, in real professional activity they manifest themselves in interrelation and interdependence.

Analytical thinking acquires particular importance in the structure of the professional competencies of military cadets, since contemporary military activity requires the ability to perceive and process large volumes of information quickly, assess the situation, forecast its development, and choose the most rational courses of action. No less important is the ability for independent learning and professional self-improvement, since the development of military technology, digital control systems, and information technologies requires constant updating of knowledge and expansion of professional outlook.

Thus, the development of the professional competencies of military cadets requires the use of such educational means that ensure not only the assimilation of educational content, but also the formation of experience in intellectual, communicative, prognostic, and practice-oriented activity. In this context, artificial intelligence is of particular interest as a modern means of supporting and intensifying the educational process.

### **Didactic Potential of Artificial Intelligence**

In the educational context, artificial intelligence is understood as a set of technologies, algorithms, and intelligent digital solutions that enable computer systems to perform the functions of analysis, learning, pattern recognition, forecasting, recommendation generation, and decision support. In education, artificial intelligence is viewed not only as a technical tool, but also as a didactic resource that expands the possibilities of organizing instruction, assessment, feedback, and support for learners' cognitive activity.

The use of artificial intelligence in education is associated with a transition from traditional unified models of instruction to more flexible, adaptive, and personalized formats. Intelligent systems are capable of taking into account the learner's individual level of preparation, pace of mastering the material, nature of recurring errors, and characteristics of cognitive activity. On this basis, they generate recommendations on the choice of content, the level of task complexity, the sequence of studying topics, and the forms of assessment. As a result, the educational process becomes more targeted, variable, and effective.



The didactic potential of artificial intelligence is manifested primarily in its ability to adapt educational material to the individual characteristics of the learner. This is especially important in conditions of heterogeneous academic groups, where cadets differ in the level of basic preparation, the speed of information perception, and the degree of development of study skills. Artificial intelligence makes it possible to construct individual learning trajectories, which contributes to fuller mastery of the material and reduces the likelihood of superficial assimilation of disciplines.

Equally significant is the possibility of rapid feedback and diagnosis of learning difficulties. Intelligent systems are capable of quickly identifying typical errors, detecting problematic areas in the assimilation of material, and offering corrective tasks. This strengthens the controlling and developmental functions of instruction, allows gaps in knowledge to be eliminated in a timely manner, and improves the overall effectiveness of pedagogical support.

Another important aspect of the didactic potential of artificial intelligence is the increase in the variability of learning tasks and the forecasting of educational outcomes. The use of intelligent technologies makes it possible to model various educational and professional situations, change task conditions, vary the degree of complexity, and track the dynamics of a learner's progress. This makes learning more flexible and closer to the real conditions of future professional activity.

Artificial intelligence also plays a significant role in automating routine assessment procedures. The checking of standard assignments, the collection and initial analysis of statistics, the monitoring of learner activity, and the recording of results can be performed automatically, which reduces the workload of the teacher and allows them to focus on more complex pedagogical tasks - interpreting results, working individually with cadets, designing learning situations, and developing professionally significant qualities in learners.

Of particular importance in military education is the possibility of creating an intellectually rich simulation environment. Artificial intelligence makes it possible to model professional situations that are as close as possible to real scenarios of service activity, including conditions of uncertainty, time pressure, the need to analyze rapidly changing information, and the necessity of choosing the optimal strategy of action. In such an environment, cadets gain the



opportunity not only to acquire knowledge, but also to apply it in dynamic situations, thereby gaining experience close to real practice.

In addition, artificial intelligence can serve as a means of supporting independent cognitive activity. Intelligent platforms and digital assistants can accompany the process of self-learning, recommend materials for revision, offer tasks based on previously made errors, and record individual progress. This contributes to the development of self-control, self-organization, and reflection skills, which are of great importance for the professional formation of a military specialist.

In military education, the above-mentioned possibilities acquire special value because they allow instruction to be brought closer to real scenarios of service activity, increase the intensity of practical training, and ensure a higher level of awareness in the actions being mastered. Consequently, artificial intelligence can be regarded as a promising didactic tool that contributes to the development of cadets' professional competencies under conditions of the digital transformation of military education.

## **Results of the Study**

The conducted theoretical analysis made it possible to identify several key areas in which artificial intelligence acts as a means of developing the professional competencies of military cadets.

### **1. Personalization of Military Professional Training**

One of the most significant advantages of artificial intelligence is the possibility of individualizing learning. Intelligent tutoring systems are able to analyze the pace of mastering the material, typical errors, the level of preparedness, and the characteristics of a cadet's cognitive activity. On this basis, they form adaptive learning pathways that make it possible to vary the complexity of tasks, the sequence of studying topics, and the forms of assessment.

For the military education system, this is particularly important because cadets differ in the level of pre-university preparation, academic motivation, and the degree of formation of basic competencies. The use of artificial intelligence makes it possible to reduce the gap between learners, increase the targeted nature of pedagogical influence, and ensure more stable dynamics of professional growth.



## **2. Development of Analytical Thinking and Information Processing Skills**

The professional activity of a military specialist presupposes work with large volumes of information, its assessment, filtering, and interpretation. Artificial intelligence can be used as a means of developing analytical thinking through the processing of scenario data, the recognition of patterns, and the modeling of the consequences of decisions made.

Work with intelligent analytical systems contributes to the development in cadets of the ability to identify significant parameters of a situation, compare alternatives, establish cause-and-effect relationships, and formulate well-grounded conclusions. Thus, artificial intelligence becomes not only a source of information, but also a means of developing the intellectual culture of professional thinking.

## **3. Formation of Decision-Making Skills Under Conditions of Uncertainty**

The military sphere places increased demands on the speed and quality of decision-making. Errors made under conditions of uncertainty can lead to serious consequences. Artificial intelligence technologies make it possible to create interactive scenarios, simulation models, and training systems in which cadets can repeatedly practice the skills of situation assessment and selection of optimal actions.

The advantage of such systems lies in the variability of scenarios, the possibility of rapid change in conditions, the analysis of errors, and the provision of personalized feedback. Owing to this, stable mechanisms of situational analysis are formed, and cadets' readiness for professional activity under non-standard conditions is enhanced.

## **4. Development of Independent Learning Activity**

Independent preparation is the most important condition for the professional development of a cadet. Artificial intelligence expands the possibilities of self-education through intelligent assistants, automated recommendations, systems for monitoring progress, and adaptive repetition of material. The learner gains the



opportunity not only to study material at an individual pace, but also to identify gaps in knowledge in a timely manner.

This contributes to the formation of self-control, self-regulation, educational planning, and reflection skills. For military training, oriented toward discipline and personal responsibility, this direction is especially significant.

### **5. Improvement of Assessment and Evaluation Procedures**

Artificial intelligence is capable of increasing the objectivity of assessing educational results. Automated systems for analyzing learning activity make it possible to take into account not only final answers, but also the process of task completion itself, the frequency of errors, reaction time, the sequence of actions, and the dynamics of progress.

In military education, such diagnostics are especially useful because they make it possible to assess not only the level of theoretical training, but also the degree of formation of the operational, prognostic, and behavioral components of professional competence. This expands the teacher's capabilities and makes it possible to move from formal control to analytically grounded support of the cadet's professional development.

### **Discussion of the Results**

The results of the study show that the use of artificial intelligence in military education has pronounced pedagogical potential. At the same time, the effectiveness of its application is determined not by the mere fact of introducing digital technologies, but by the quality of their pedagogical integration. Artificial intelligence becomes a productive means of developing professional competencies only if it is included in a well-designed educational model oriented toward the goals of military professional training.

From a pedagogical point of view, it is important to take into account that artificial intelligence cannot be regarded as an autonomous replacement for the teacher. Military education presupposes not only the transmission of knowledge and the formation of skills, but also the cultivation of value orientations, moral responsibility, discipline, professional identity, and readiness to serve. These aspects require live pedagogical interaction, the personal influence of a mentor, and an educational environment that cannot be fully technologized.



Alongside the advantages, there are also limitations in the use of artificial intelligence in the training of cadets. These include the risks of reduced critical perception of digital recommendations, the possibility of algorithmic errors, the dependence of the quality of decisions on the data on which intelligent systems are trained, as well as issues related to the protection of official and confidential information. In the military educational environment, these limitations require an especially balanced approach to the selection of digital platforms, the regulation of their use, and the development of information security mechanisms.

In addition, a necessary condition for the successful integration of artificial intelligence is the advanced training of the teaching staff. A teacher must possess not only subject knowledge, but also the foundations of digital pedagogy, understand the possibilities and limitations of intelligent systems, be able to design tasks using them, and interpret learning analytics results.

Therefore, the prospects of artificial intelligence in military education are determined by the combination of technological innovation with pedagogical expediency, professionally oriented content, and a normatively regulated safe educational environment.

## **Conclusion**

Under modern conditions, artificial intelligence acts as a significant means of developing the professional competencies of military cadets. Its use makes it possible to increase the level of personalized learning, develop analytical thinking, improve decision-making skills, expand opportunities for independent preparation, and increase the objectivity of assessing academic achievements.

The analysis carried out showed that artificial intelligence is of the greatest value as part of adaptive learning systems, analytical platforms, digital training devices, and simulation complexes oriented toward modeling professional military activity. At the same time, its application should be based on the principles of pedagogical expediency, information security, ethical responsibility, and preservation of the leading role of the teacher in the educational process.

Prospects for further research are connected with the development of pedagogical models for integrating artificial intelligence into the system of military professional training, the experimental verification of their effectiveness, as well



as with the study of the influence of intelligent technologies on the formation of specific groups of cadets' competencies in various areas of military education.

## References

1. Avanesov, V. S. Kompozitsiya testovykh zadaniy: uchebnaya kniga dlya prepodavateley vuzov, uchiteley shkol, aspirantov i studentov pedvuzov. 3rd ed., revised and supplemented. Moscow: Tsentr testirovaniya, 2002. 240 p.
2. Bospalko, V. P. Slagaemye pedagogicheskoy tekhnologii. Moscow: Pedagogika, 1989. 192 p.
3. Zeer, E. F. "Competency-based approach to the modernization of vocational education." *Vysshee obrazovanie v Rossii*, no. 4, 2005, pp. 23-30.
4. Castells, M. *Informatsionnaya epokha: ekonomika, obshchestvo i kultura*. Moscow: HSE, 2000. 608 p.
5. Lerner, I. Ya. *Didakticheskie osnovy metodov obucheniya*. Moscow: Pedagogika, 1981. 186 p.
6. Raven, J. *Kompetentnost v sovremennom obshchestve: vyyavlenie, razvitie i realizatsiya*. Moscow: Kogito-Tsentr, 2002. 396 p.
7. Khutorskoy, A. V. "Key competencies as a component of the learner-centered educational paradigm." *Narodnoe obrazovanie*, no. 2, 2003, pp. 58-64.
8. Chassignol, M., Khoroshavin, A., Klimova, A., and Bilyatdinova, A. "Artificial Intelligence trends in education: a narrative overview." *Procedia Computer Science*, vol. 136, 2018, pp. 16-24.
9. Holmes, W., Bialik, M., and Fadel, C. *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Boston: Center for Curriculum Redesign, 2019. 244 p.
10. Luckin, R., Holmes, W., Griffiths, M., and Forcier, L. B. *Intelligence Unleashed: An Argument for AI in Education*. London: Pearson, 2016. 46 p.
11. Russell, S., and Norvig, P. *Artificial Intelligence: A Modern Approach*. 4th ed. Hoboken: Pearson, 2021. 1232 p.
12. UNESCO. *AI and Education: Guidance for Policy-makers*. Paris: UNESCO, 2021. 64 p.
13. Zawacki-Richter, O., Marin, V. I., Bond, M., and Gouverneur, F. "Systematic review of research on artificial intelligence applications in higher education -



where are the educators?" *International Journal of Educational Technology in Higher Education*, vol. 16, 2019, article 39.

14. Woolf, B. P. *Building Intelligent Interactive Tutors: Student-centered Strategies for Revolutionizing E-learning*. Burlington: Morgan Kaufmann, 2010. 466 p.
15. Luckin, R. *Machine Learning and Human Intelligence: The Future of Education for the 21st Century*. London: UCL Institute of Education Press, 2018. 232 p.