BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg

DEVELOPMENT OF MODERN FORMS OF TRAINING IN THE SYSTEM OF TRAINING MILITARY SPECIALISTS

senior lecturer of the artillery department
at the Institute of Land Forces
Aleksey Nikolaevich Sanakulov
doi:https://doi.org/10.5281/zenodo.22823979

Abstract. The article discusses modern forms of education that can be used in the training of military professionals. The development of technology and information systems is changing the requirements for military personnel training. Along with traditional classes, distance and blended learning, simulators, computer modelling, virtual and augmented reality are increasingly being used. The article examines the possibilities of applying these technologies in the educational process, as well as their main advantages and limitations. Particular attention is paid to combining digital learning tools with practical training. It is concluded that modern technologies can improve the quality of training, but they should not completely replace practical education.
Keywords: military education, military training, military professions, learning methods, distance learning, blended learning, simulators, virtual reality, modelling, artificial intelligence, digital technologies.

Аннотация. В статье рассматриваются современные формы обучения, которые могут применяться при подготовке специалистов по военным профессиям. Развитие техники и информационных технологий меняет требования к уровню профессиональной подготовки военнослужащих. В связи с этим наряду с традиционными занятиями всё чаще используются дистанционное и смешанное обучение, тренажёры, компьютерное моделирование, виртуальная и дополненная реальность. Рассматриваются возможности применения данных технологий в образовательном процессе, а также их основные преимущества и ограничения. Особое внимание уделяется сочетанию цифровых средств обучения с практическими занятиями. Сделан вывод о том, что современные технологии могут повысить качество подготовки, однако не должны полностью заменять практическое обучение.
Ключевые слова: военное образование, военная подготовка, военные профессии, формы обучения, дистанционное обучение, смешанное обучение, тренажёры, виртуальная реальность, моделирование, искусственный интеллект, цифровые технологии.

The training of specialists in military professions has always been linked to the need to combine theoretical knowledge with practical skills. A serviceman must know the structure and procedure for using equipment, be able to work with it, interact with other specialists, and make decisions in various situations.

Currently, requirements for specialist training are changing. Military equipment is becoming more complex, the number of digital systems is increasing, and unmanned technologies and communication tools are actively developing. Therefore, traditional teaching methods are no longer always sufficient.

This does not mean that it is necessary to abandon familiar methods. Rather, they must be supplemented with modern technologies. In the military education system, electronic courses, remote classes, simulators, and various types of modeling are already being used [1].

In this regard, it is of interest to consider new forms of training and the possibilities of their use in training specialists in military professions.

One of the simplest forms of implementing modern technologies is **mixed learning**. It combines traditional classes with the use of electronic educational resources. Students can study a portion of the theoretical material independently. This can be done using electronic textbooks, video materials, tests, and training courses. During face-to-face sessions, the instructor can devote more time to practical matters, error analysis, and completing assignments. This approach allows for a more efficient use of class time. In addition, the student has the opportunity to review the material at a convenient time.

Experience with remote technologies has shown that they can also be useful in the military education system. Within the NATO Defence Education Enhancement Programme, attention is given to the development of distance learning and the digital competencies of instructors [2].

At the same time, it is not advisable to fully transition the training of military personnel to a remote format. Many skills can only be developed during practical sessions.

Exercises have long been used in training specialists of various professions. For military education, they are also of great importance.

With the help of a simulator, you can repeat the same exercise many times without constantly using real techniques. This allows for the saving of equipment resources while simultaneously providing the learner with the opportunity to correct errors. In addition, modern simulators can record the student's actions. The instructor gains the opportunity to see what mistakes were made and at what stage difficulties arose.

Computer modeling also allows for the creation of various learning situations. As part of the preparation, one can change the conditions for performing the task and gradually increase its complexity. The use of computer simulations is considered one of the elements of the modern military training system [1].

Thus, simulators are a useful supplement to practical classes and allow for a more diverse learning process.

In recent years, increasing attention has been paid to virtual (VR) and augmented (AR) reality technologies. Virtual reality allows for the creation of a learning situation in which the learner can perform specific actions within the digital environment. At the same time, it is not required to fully reproduce the real situation.

Such technologies can be used, for example, to study equipment, prepare for working with machinery, and practice individual professional actions.

Research indicates that the use of augmented reality technologies can increase students' engagement and provide them with the opportunity to gain practical experience in a safe learning environment [3; 4]. The experience of using XR technologies in training military personnel is also of interest. For example, in Norway, the possibility of using augmented reality in training specialists related to the operation of combat tanks is being studied [5]. However, virtual reality also has certain limitations. It cannot fully convey the physical load, the real conditions of working with equipment, and all the specifics of interaction between military personnel. Therefore, it is most appropriate to use VR and AR alongside regular practical sessions.

Scenario learning is distinguished by the fact that the learner is first offered a specific situation, after which they must independently choose the action option. For example, one can set a learning task in which the initial conditions change or additional factors appear, and the learner must assess the situation and make a decision. Such classes help develop independence and the ability to apply acquired knowledge in practice. Furthermore, they allow the teacher to evaluate not

only the student's knowledge but also their ability to use it in a specific situation. Scenario learning is particularly convenient to combine with computer simulators. In this case, the learner's actions may influence the further development of the learning situation.

Another option for changing the organization of the educational process is **modular learning**. The essence of this approach is that a large curriculum is divided into separate blocks. Each block is dedicated to a specific topic or professional skill. For example, equipment operation, maintenance, communications, information security, and other areas may be studied separately. The advantage of this approach is that individual modules are easier to update. If the equipment has changed or there are new requirements for the specialist, it is not necessary to completely change the entire program.

Modular training is also convenient for improving the qualifications of military personnel. A specialist can complete exactly the training block they need for their future work.

Artificial intelligence (AI) is gradually becoming part of the educational process. Its application is also of interest for training specialists in military professions, especially where work with large volumes of information, analysis of training results, and individual selection of training tasks are required.

One of the most understandable areas is the use of artificial intelligence to control knowledge. After completing tests or practical tasks, the system can analyze the trainee's results, identify topics where the most mistakes were made, and offer additional materials for review. As a result, the trainee gains the opportunity to devote more time specifically to the issues that cause them difficulty.

Another direction could be the creation of individual curricula. The level of training of military personnel can vary significantly even within a single training group. One student assimilates theoretical material faster, while another requires more time to consolidate practical skills. The system, which utilizes artificial intelligence technologies, can account for the results of previous sessions and offer tasks of appropriate complexity.

AI can also be applied when working with simulators. During the execution of the training exercise, the system is capable of recording the learner's actions, comparing them with the established criteria, and showing the teacher the most frequently repeated errors. This allows for a more specific analysis of the subsequent lesson.

The use of **intelligent virtual assistants** is a promising direction. They can answer questions about the educational material, help review the topics covered, and formulate additional assignments. For example, after studying a specific section, a student may be offered a small test or a set of questions for self-checking.

Artificial intelligence also provides certain opportunities in the preparation of educational materials. With its help, the teacher can more quickly prepare test assignment options, learning situations, independent work questions, and review materials. At the same time, the material prepared using AI must be reviewed by the teacher, as the automated system may make mistakes or offer information that does not correspond to the specific curriculum.

It should be noted separately that artificial intelligence can be applied in modeling educational situations. In a digital educational environment, one can create various variants of the development of the same situation. The learner is asked to make a decision, after which the system demonstrates the further development of the scenario. This approach allows for not only knowledge but also the sequence of decision-making.

When using AI in military education, it is necessary to consider information security issues. The training system must not automatically access information that is not intended for use in the

educational environment. It is also necessary to control what data is saved by the system and who has access to it.

Another important issue is related to responsibility for the decisions being made. Artificial intelligence can help a teacher analyze learning outcomes, but the final assessment of professional training should remain with the specialist. This is especially important in the training of military personnel, where a person's level of readiness cannot be assessed solely by the results of automatic testing.

Thus, it is advisable to consider artificial intelligence primarily as an additional learning tool. It can facilitate the teacher's work, help the student identify their own shortcomings, and make the learning process more individualized. At the same time, AI should not replace the teacher, instructor, or practical training.

In the future, we can expect the expansion of such systems in military education. Their combination with electronic courses, simulators, and modeling systems appears to be the most promising. In this approach, the results of various types of training can be used to more fully evaluate the preparation of each student.

At the same time, at the stage of developing educational programs, it is necessary to determine which tasks should be transferred to intelligent systems and which should remain with the teacher. This approach will allow for the use of artificial intelligence advantages without excessive dependence on digital technologies.

Military activity is almost always associated with collective work. Therefore, when training specialists, it is important to develop not only individual skills but also the ability to interact with other military personnel. For this purpose, group exercises, learning situations, and various types of team simulations can be used.

During the task, each participant receives a specific role, and after completing the exercise, an analysis is conducted, during which the group's actions and individual errors are analyzed. This form of learning allows for the simultaneous development of professional skills, the ability to interact, and the ability to make decisions within a group.

Using new technologies has not only advantages but also certain difficulties. First and foremost, appropriate equipment and software are required. Creating modern simulators and virtual training complexes requires significant resources. An important issue is the training of teachers. To utilize new technologies effectively, the instructor must not only know their field of expertise but also understand the capabilities of digital tools.

There is another problem: excessive enthusiasm for digital technologies. If all practical classes are replaced by them, the quality of training may, on the contrary, decrease. The military profession involves practical experience; therefore, working with real equipment and conducting practical classes must retain their significance.

The development of technology leads to the need to gradually change the forms of training specialists in military professions. Alongside traditional classes, mixed learning, electronic courses, simulators, computer modeling, virtual and augmented reality, as well as scenario and team-based learning forms, can be effectively utilized. Each of these technologies has its own advantages.

At the same time, the most effective approach is not to abandon the traditional system, but to rationally combine new and existing forms of learning.

An important direction for the further development of military education should be the creation of a training system in which digital technologies assist both the teacher and the student, but do not replace practical training. It is precisely the combination of theoretical knowledge,

simulator training, and practical sessions that ensures the necessary level of professional readiness for a specialist.

List of used sources:

1. Education and Training // NATO: official website. – URL: https://www.ATO.int/cps/uk/ATOHQ/topics_49206.htm (accessed: 01.09.2026).
2. NATO enhances defense education efforts through digital transformation. – 10 December 2021. – URL: https://www.ATO.int/en/news-and-events/articles/news/2021/12/10/ATO-BOOSTS-DEFENCE-EDUCATION-EFFORTS-THROUGH-DIGITAL-TRANSFORMATION (accessed: 01.09.2026).
3. Military education in extended reality (XR): learning troublesome knowledge through immersive experiential application // The Visual Computer. - 2024. – URL: https://link.springer.com/article/10.1007/s00371-024-03339-w (access date: 01.09.2026).
4. Advancing Military Education and Training through VR Solutions // NATO eAcademy. – URL: https://deepportal.hq.ATO.int/eacademy/events/advancing-military-education-and-training-through-vr-solutions/ (access date: 01.09.2026).
5. Military Education in Extended Reality: Battle Tank Training for War // Norwegian