Volume 3, Issue 6, June – 2025 **ISSN (E):** 2938-379X

ESTABLISHING INTERDISCIPLINARY CONNECTIONS BY SOLVING PHYSICAL PROBLEMS OF A MILITARY-PRACTICAL NATURE

Misirov Shirazi Choriyevich
Associate Professor of the Academy of the
Armed Forces of the Republic of Uzbekistan

Abstract
The article examines the importance of theoretical and methodological study of the processes of unification of disciplines in the field of pedagogy and their application in practice based on the analysis of scientific research conducted by world scientists in this field, from the point of view of the need to provide a modern education system with the organization of training based on interdisciplinary connections. Today it has been established that the study of physics in higher military educational institutions in didactic interaction with special military educational disciplines, as a result of solving existing problems, contributes to increasing the effectiveness of officer training. In particular, it is shown that the solution to the problem of solving physics problems in the context of interdisciplinarity, the experience accumulated in the educational systems of schools and civilian universities on this problem serve as the basis for improving the organization of the educational process in higher military educational institutions.

Keywords: Educational system, interdisciplinarity, scientific research, military education, physics, matter, special military sciences.

Introduction

We live in the 21st century, in the era of comprehensive development and progress. To date, humanity has made great discoveries in various fields of science and technology. As science and technology develop, military equipment and weapons are also being improved. After the Republic of Uzbekistan gained independence, major changes took place in the military sphere. Every state must have a strong army, equipped with modern technology and weapons, to ensure the security of its people and the inviolability of its borders. Therefore, raising the younger generation in the spirit of love for the Motherland, devotion to their people and patriotism, as well as interest in military professions is an integral and important component of education.
Detailed knowledge of modern combat weapons and combat equipment, the use of their main capabilities is a criterion for the full defense and combat capability of the army. These factors, in turn, are based on the cadets' knowledge of the laws of physics, postulates and processes. The specialists of the industry are entrusted with great tasks in the development of the country

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1
Licensed under a Creative Commons Attribution 4.0 International License.

and the defense of the country. As is known, the future of each society is determined by the level of development of its education system, which is its integral part and a vital necessity.
The specialists of the industry are entrusted with great tasks in the development of the country and the defense of the country. As is known, the future of each society is determined by the level of development of its education system, which is its integral part and a vital necessity. The general pedagogical and didactic requirement for all stages of training is aimed at increasing the effectiveness of independent work of cadets and students based on the development of their knowledge, imagination and programming skills, increasing their interest in scientific thinking and academic subjects, deepening their professional knowledge, increasing their activity during theoretical and practical training.
Today, one of the main requirements of our state policy is the training of qualified specialists for the Armed Forces of Uzbekistan, educating them in the spirit of devotion and love for the Motherland, instilling in them a sense of determination, courage, and a responsible approach to fulfilling their duty. In the festive congratulations of our esteemed President on the occasion of the 33rd anniversary of the formation of the Armed Forces of the Republic of Uzbekistan and the Day of Defenders of the Fatherland, it was emphasized that “Maintaining the security, peace and tranquility of our people will remain our top priority both today and in the future.” In this regard, we need to take the work we have begun in this direction to a completely new qualitative level, based on the strategy "Uzbekistan - 2030". In particular, we will continue to equip the Armed Forces with new, modernized systems and fire control means, taking into account the specifics of the theater of military operations and priority areas for the development of troops. We pay special attention to increasing the intellectual potential of military personnel, educating young people in the spirit of patriotism, improving the quality of primary military education in schools, and strengthening the work of preparing young students for military service. “The professional skills of soldiers and officers, the effectiveness of training in military educational institutions, and the creation of a reserve of qualified military personnel will always remain our priority tasks,” it is directly indicated that special attention is currently being paid to issues of reforming the Armed Forces of our Independent Uzbekistan [1].
The combat capability and readiness of the Armed Forces depend primarily on the high moral and spiritual qualities and intellectual capabilities of military personnel, and the adoption of insufficiently substantiated decisions can lead to defeat in combat and entail excessive losses. To prevent the occurrence of such situations, a serviceman must be able to correctly select the most appropriate solution, that is, have control over the factors and information that ensure the success of a combat operation in battle, be able to foresee the course of the battle based on his logical-analytical, intellectual abilities, that is, creative thinking, and the military unit must be able to solve various military problems, such as determining the quantity and quality of combat equipment, weapons, ammunition, fuel and supplies, as well as the expected average losses in combat based on known information about the enemy. There are various methods based on the laws of physics, chemistry and mathematics, allowing to solve the process of such military actions more deeply and with sufficient accuracy. Therefore, a future officer, along with military science, must have a high level of mastery of natural and exact sciences and their

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1

Licensed under a Creative Commons Attribution 4.0 International License.

application. Teaching physics in higher military educational institutions in lectures, practical, laboratory and independent studies with a military focus, that is, demonstrating the application of physics in the military field, undoubtedly contributes to increasing the level of military training of future officers, developing analytical and thinking abilities. It teaches students to develop strategic thinking skills, expand their scientific horizons, easily absorb knowledge about the structure and operating principles of military equipment and weapons, and make quick and accurate conclusions. The current pace of development of military equipment and its production determines the requirements for the quality of professional training of future officers of the Armed Forces of Uzbekistan.

This is characterized by the ability to solve professional problems with maximum dynamism and creativity, as often required by tactical and operational conditions of combat operations. Political, economic and social processes occurring in the world indicate the formation of a multipolar military defense system. In modern conditions, sharp disagreements arise that can unexpectedly develop into a military conflict or a large-scale war. Learning lessons from the events taking place in Ukraine, Syria and similar countries is one of the pressing problems in officer training. It is in the hotbeds of war that shortcomings in the training of military specialists become especially acute. According to A.N. Polosin [2], a study of the professional training of graduates of higher military educational institutions shows that 28% of young officers have deficiencies in their preparation for command and control activities, 32% have deficiencies in their preparation for engineering and operational activities, 37% - in preparation for educational work. About 40% of graduates do not have sufficient knowledge of standard weapons systems and military equipment, are not sufficiently prepared for their practical use, especially in field conditions, as well as for practical application and restoration. A.A. Poroshin [3] also notes that operational-technical skills and independent work skills of young officers are formed at an even lower level. As a result, they experience the greatest difficulties in operating equipment, properly managing the work process, searching for and eliminating technical faults, that is, in solving practical issues of a problematic search and research nature.

One of the reasons for the insufficient quality of training of military specialists is the weak connection between engineering and military disciplines with physics, the absence of a holistic training system. There are certain contradictions between the independent mastering of individual disciplines and their comprehensive and integrated application in practice. In the process of differentiated (unrelated) study of physics, engineering and military-specialized sciences, cadets develop differential knowledge and skills that do not allow them to properly manage military-technical systems and achieve effective results in combat conditions. Similarly, cadets cannot apply their knowledge of physics to solving complex problems in military specialties. Practice has shown that cadets do not know how to apply the acquired knowledge of physics to explain the process and principles of operation of individual mechanisms and units of military equipment. This state of affairs in modern education requires from officers of the Uzbek army a new approach to thinking, a wide range of knowledge, skills and abilities, in a word, a high level of professional training.

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1
Licensed under a Creative Commons Attribution 4.0 International License.

Currently, scientists are conducting scientific research aimed at achieving results in the acquisition of a wide range of knowledge, skills and qualifications by cadets of higher military educational institutions. In scientific studies by Golubeva [4] and others, various aspects of the problems of fundamentalization of secondary and higher vocational education were considered.

"Fundamental education should form a holistic picture of the scientific structure of the world, lay the foundation for scientific training for subsequent professional activity, promote the creative development of the individual and the correct choice of an individual program." [5]

At the same time, fundamentalization can weaken the real connection between education and its professional focus. V.V. As Kondratyev noted, teaching practice shows that at present there is no harmonious relationship between fundamental and specialized disciplines. The problems of the relationship between the professional and fundamental parts of education are still not sufficiently theoretically substantiated. [6]

N.A. Kleshcheva believes that the fundamentalization of education in higher education can be carried out in different directions and at different levels. Updating the content and improving its structure and composition, strengthening intra - and interdisciplinary connections, creation of new integrative interdisciplinary lecture courses and practical classes, adaptation of the content of theoretical courses to the professional tasks of future specialists, creation of curricula and programs based on an integrative-modular approach, etc. [5].

The modern education system must ensure the organization of training based on interdisciplinary connections, and from this point of view it is important to study the theoretical and methodological processes that unite disciplines in the field of pedagogy and apply them in practice. Therefore, today there is a pressing need to study physics in higher military educational institutions in didactic connection with specialized military sciences; the solution of these problems will serve the training of highly qualified officers. The problem of interdisciplinary connections occupies one of the central places in modern didactics and deserves the attention of a wide range of researchers. The ways and means of practical application of interdisciplinary connections in the educational process are considered in the scientific works of Fedorova, V.N. Maksimov and others. [7]

It should be noted that all the above works relate to school and higher civilian education. Naturally, the conclusions made during these studies will not yield positive results when directly applied to the system of higher military education. This requires serious theoretical and methodological work on adapting the results of research in the field of civilian higher education to the system of training officers in military-technical universities. The main tasks of the study we have begun are aimed at achieving this goal. The lack of development of the problems of interdisciplinary connections in higher military educational institutions is explained by the absence of special studies aimed at their solution. It is possible to single out the studies of only a few authors associated with this area, for example, R.A. Akhmetgareev, N.I. Reznik, I.V. Nikolaeva, I.P. Makletsova and others. Therefore, at present it is necessary to develop methodological foundations for teaching general education disciplines in military universities in didactic connection with special military educational institutions. All of the

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1

Licensed under a Creative Commons Attribution 4.0 International License.

above confirms the relevance of this work and the need to continue research into the problems of implementing interdisciplinarity in higher military educational institutions at the methodological, didactic and scientific-methodological levels. Often, various methodological and didactic categories are used as methods and means of applying interdisciplinarity in practice. The content of individual classes, the content of scientific knowledge, the use of the same methodological instructions, problem solving. In particular, applying it to higher military educational institutions, I.B. Nikolaeva studied the problems of implementing interdisciplinary links between the physics course and general professional and special disciplines within the framework of the problem-modular approach.

The development of modern equipment and technologies in military production, which surpasses civilian production, requires graduates of higher military educational institutions - officers - to have a deep knowledge of the scientific foundations of the principles of operation of military equipment in their specialty (for example, the most powerful and advanced military machine - the tank). The extreme complexity of modern military technology raises the special role and importance of higher military education to a higher level. In the era of rapid technological development, when the volume of scientific data increases every year, further expansion of the volume of the physics curriculum by adding new practical questions (problems) is impossible.

It should be concluded that at the current stage of development of higher military education, the time has come to create fundamental knowledge and skills in graduates of higher military educational institutions that will allow them to understand the scientific basis for the use of any complex military equipment. It is impossible to accomplish this task without knowledge of the basics of general education disciplines taught in higher military educational institutions.

Physics is one of the fundamental sciences that serves the development of modern technology and engineering (including in the military field), so it plays an important role in solving military-practical problems. It is worth noting that solving problems in physics of a military-practical nature is one of the areas of interdisciplinary communication in higher military educational institutions.

In modern didactics, the methodology and scientific and methodological foundations for solving problems in physics are very well developed, which is due to merit. This is expressed in the works of Kamensky, I.N. Nizomov and others. Research by G.D. Bukharova and R.P. Fomin revealed the possibilities of using physics issues in general technical (polytechnic) education. V. N. Yantsen [8] considered interdisciplinary problems of physics as one of the means of establishing connections between disciplines with the aim of applying them in school education. The importance of interdisciplinary problems in the formation of motivation and interest in learning among cadets is demonstrated in the scientific works of such authors as N. Ternova and A. Usova [9, 10]. In the work of N. Vdovenko [11], the practical application of interdisciplinary issues in specialized areas is considered as a means of optimizing the quality of training specialists. The problem of solving physics problems used in higher military educational institutions was considered by M. Drapkin in M. Israilov [12,13] from the point of view of generalizing the process of solving problems using a software manual, but the

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1

Licensed under a Creative Commons Attribution 4.0 International License.

principles of solving problems in physics in the military-practical direction were not considered.

Conclusion

All of the above leads to the conclusion that the problem of solving a physics problem in the context of interdisciplinary connections is quite complex, but it has its own solution, since the experience accumulated in the educational systems of schools and civilian universities on this problem can serve as a basis for organizing (or improving) the educational process in higher military educational institutions.

References

1.Ш. М. Мирзиёев. Ўзбекистон Республикаси Қуролли Кучлари ташкил этилганининг 33 йиллиги ва Ватан ҳимоячилари куни муносабати билан байрам табриги. https://president.uz/uz/lists/view/7812.2025.

2. Полосин А.Н. Формирование профессиональных качеств у курсантов вузов танковых, мотострелковых войск: Дисс…канд.пед.наук.-Казань, 2000.-206 с.

3. Порошин А.А. Педагогическая система формирования у курсантов военно-учебных заведений готовности к активной самостоятельной работе: Дисс…канд.пед.наук.-Саратов, 2000.-184 с.

4.Голубева О.Н. Концепция фундаментального естественнонаучного курса в новой парадигме образоввания // Вышее образование в России, 1994.-№4.- с.23-27.

5. Клещева Н.А. Курс физики как методологическая и методическая основа системы обучения студентов дисциплинам технического цикла в вузе: Дисс…док.пед.наук.-Владивосток, 2000.-319 с.

6.Кондратьев В.В. Фундаментализация профессионального образования специалиста на основе непрерывной математической подготовки в условиях технологического университета: Дисс…док.пед.наук.-Казань, 2000.-421 с.

7.Федорова В.Н. Воспитывающая и развивающая функции межпредметных связей естественнонаучныых учебных дисцилин // Межпредметные связи в преподавании основ наук в средней школе. Межвузоввский сборник научных трудов. – Челябинск, 1982.-с 3-10.

8.Янцен В.Н. Задачи по физике с позиции межпредметных связей // Физика в школе, 2002. - №4. –с 18-22.

9.Тернова Н.А. Развитие мотивации и познавательного интереса старшеклассников в процессе решения межпредметных задач(на материале предметов естественно-математического цикла): Дисс…канд.пед.наук.-Саратов, 2000.-195 с.

10.Усова А.В., Тулькибаева Н.Н. Практикум по решению физических задач. – М.: Просвещение, 2001. -206 с.

11.Вдовенко Н.В. Оптимизация качеств подготовки специалистов в вузе посредством использования межпредметных профессиональных задач: Дисс…канд.пед.наук.-Саратов, 1999.-177 с.

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1

Licensed under a Creative Commons Attribution 4.0 International License.

12. Драпкин М.А. Формирование у студентов обобщенной структуры деятельности по решению задач с помощью программированного пособия (на материале количественных задач по курсу общей физики высшего военного инженерного училища): Дисс…канд.пед.наук .-Челябинс, 1987.-193 с.
13.Israilov M. To the teory of current and voltage resonance in an RLC oscillator circuit.//Web of Teachers: Inderscience Research.ISSN(E):2938-379X.Volume 3, Issue 05, May,2025. P.303-307. Hhpts://webofjournals.com

Web of Teachers: Inderscience Research
webofjournals.com/index.php/1

Licensed under a Creative Commons Attribution 4.0 International License.