



FUNDAMENTALS OF DEVELOPING STUDENTS' PROFESSIONAL COMPETENCIES BASED ON AN INTEGRATIVE APPROACH

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A B S T R A C T	KEY WORDS
This article presents the scientific basis for the development of students' professional competencies based on an integrative approach. The concept of professional competence is explained in detail using the definitions of this concept by Uzbek and foreign scholars. The analysis fully justifies the need to use the integration of mathematics, computer science and physics in the development of students' professional competencies.	Competence, professional competence, integration, integration of disciplines, integrative approach, fundamental knowledge, curriculum, interactive method, professional adaptation, professional formation.

Introduction

State policy in the field of personnel training provides for the intellectual and spiritual-moral upbringing of a person, the formation of a comprehensively developed personality based on the activities of institutions of the continuing education system. The problems of training specialists with the skills and qualifications to operate in a competitive, market economy arise in the process of scientifically substantiating the essence of the goals, content, methods and organizational forms of training in each science, which serve to develop the professional-technical, general cultural, and intellectual potential of future specialists. In order to deeply master the foundations of modern science, first of all, a full-fledged study of the foundations of mathematics is required.

A teacher, no matter how experienced and qualified, cannot help a student who does not have basic training in mathematics and related subjects (physics, computer science, chemistry, biology, and mechanics) effectively master the basics of these subjects. Due to the increasing role of knowledge in the process of ensuring the progress of science and technology, every future teacher is realizing that he must have in-depth knowledge in order to conduct research on new problems and tasks in this area, effectively use modern technologies and methods in the educational process, quickly adapt to the requirements of the employer, and widely apply theoretical knowledge, skills, and experiences in practice.

To date, 70 percent of countries in the world use integrated curricula and textbooks in their education systems. As a result of the use of educational integration, favorable conditions are created for the

implementation of educational goals in pedagogical and psychological terms; general didactic requirements are fulfilled in a coherent manner; the student's time and energy are saved; excessive mental and physical stress is prevented, and educational efficiency increases.

Students have the opportunity to comprehensively master the necessary skills and competencies, concepts and knowledge as a result of harmonizing the content of educational subjects. We emphasize that integration in the educational process is within a certain subject and interdisciplinary, and its implementation in lessons serves as a process of integrative approach. The integrative approach is used to integrate subjects that are related in content, related, logically interdependent, and mutually deepening and expanding, and is aimed at forming a holistic logically complete knowledge, methods of work and action, and personal qualities.

The integrative approach is based on the consideration, reliance, integration of knowledge, skills, qualifications and experience obtained from mastering different subjects, communication in foreign languages, professional formation, professional adaptation, professional communicativeness, and the simultaneous development of professional competence.

Among the various specialized disciplines taught in higher education institutions, the amount of time allocated to teaching mathematics, computer science and physics takes a leading place among these disciplines. As an integral part of the educational process, they help students understand the role and importance of their chosen specialties in the process of scientific and technological development, and also ensure that students are confident that they can use their knowledge of mathematics, computer science and physics as a means of solving professional problems.

Knowledge of mathematics, computer science and physics expands the scope of students' creative thinking, professional competence, helps them form skills and abilities in mathematical modeling methods and preliminary diagnosis of the results of the studied phenomena. All this requires expanding the scope of organizing the teaching of mathematics, computer science and physics in higher educational institutions, developing the professional qualities of students, and forming theoretical knowledge, practical skills and competencies in harmony with each other. At the same time, the materials mastered in the process of mathematics education serve to illuminate some general rules for improving the professional training of students through general and specialized disciplines. Today, the requirements for the level of theoretical and practical knowledge acquired by graduates of higher educational institutions create conditions for certain changes in teaching based on an integrative approach. The practical importance of mathematics, computer science and physics and the need to increase the level of fundamental training of students are emerging. In order to improve the level of teaching of mathematics, computer science and physics in higher educational institutions, it is necessary to develop a clear, comprehensive program for each specialty.

General mathematics education serves as the main foundation for higher mathematics, which is being taught in higher educational institutions that train specialists. This is important for students to successfully master the basics of general theoretical and special subjects provided for in the curricula created for various specialties. The program of mathematics, computer science and physics for higher educational institutions reflects the new requirements for modern education.

The priority is given to such features as practical orientation and directing students to solve practical problems. The content of mathematics, computer science and physics consists of a large amount of knowledge, and the time allocated for its study is limited. This situation does not allow students to fully master the body of knowledge. Among the problems related to mathematics, computer science

and physics in the educational process organized in higher educational institutions, the following can be highlighted:

- 1) bringing the content of a specialist's mathematical knowledge closer to the needs of modern technology and production;
- 2) ensuring continuity between mathematics, computer science and physics education and specialized disciplines;
- 3) creating programs and textbooks that are suitable for the needs of future specialists and mathematics, computer science and physics;
- 4) improving the methods of presenting educational material and increasing student activity in the learning process;
- 5) creating interactive teaching methods;
- 6) improving the mathematical literacy of teachers of specialized departments;
- 7) organizing scientific research related to the specialties of higher educational institutions in special departments;
- 8) providing the necessary guidance in mathematics, computer science and physics for the activities of employees of the specialty (industry, agriculture, construction, etc.);
- 9) organizing the integration of disciplines based on the requirements of the employer.

The solution of the above problems requires improving the content of mathematics, computer science and physics education, which is as close as possible to the needs of future specialists. For example, a program developed for the mathematical training of future specialists should primarily take into account not only the logical mathematical integrity of the course, but also the needs of the specialization chosen by students.

However, some general ideas of modern mathematics should be incorporated into the curricula of academic disciplines intended for training personnel. Programs for training various specialists should be created based on the level of knowledge required in the parts of mathematics. The content of the mathematics program taught in higher educational institutions should, first of all, systematically present natural phenomena and technical processes, their study, the formulation of mathematical problems, the creation of new mathematical concepts, and the connection of mathematical theories with practice. A mathematics curriculum should be structured in a way that provides students with a thorough education and prevents them from making logical errors and unfounded conclusions.

Today, there are some difficulties in training qualified specialists, which are associated with historical, cultural, social and economic reasons. Some aspects of the education system, in particular, the auditorium system, generalization of the program of training and education of students, adaptation of the content of curricula to the requirements of those with an average level of knowledge, have lost their significance. Although much work has been done in this area, it is not enough.

The training of highly qualified, modern knowledge, capable of thinking in accordance with the requirements of the present day is the key to solving both socio-political and economic problems. The state must remain responsible for the formation of its intellectual potential, its effective use, and the need for young people graduating from educational institutions. Based on the requirements of natural, general, exact and general education sciences, students graduating from them should know the features of analyzing and generalizing social, economic, organizational indicators of determining the state of production and management, mathematical modeling of complex systems and processes.

The teaching of all subjects should be systematically coordinated, aimed at the single goal - the training of specialized specialists who can professionally adapt to the requirements of the time. Improving the quality of education is one of the most urgent problems of the entire world community today. To solve it, it is necessary to modernize the content of education, revise the technologies of the educational process and, of course, the ultimate goal of education.

Education can be considered as a specially organized process of developing the ability of students to independently solve problems of personal and social importance in various fields of activity based on the assimilation of the culture of society. Such an understanding of the purpose of education, in turn, creates the basis for implementing a competent approach.

From the point of view of the requirements for the level of professional training of graduates of higher educational institutions, competence means the ability of a future specialist to purposefully apply a set of knowledge, skills and qualifications, methods of activity in specific situations. From the point of view of pedagogical activity, competence is the ability to establish a connection between knowledge and the situation or, in a broad sense, the ability to show and find the process (action and knowledge) necessary to solve a problem.

Competence is characterized not only by the set of knowledge and skills, but also by the ability of students to mobilize and apply their acquired knowledge in practice in specific situations. According to Sh.B. Khasanova, the competencies formed in students are divided into three levels: basic competencies; general (subject) competencies; private (biological) competencies. We divided competencies into basic and core competencies.

Basic competencies are competencies that, by their description and level of application, correspond to the specialty under consideration. It can also be called professional competencies. Basic competencies are determined at the level of educational blocks and academic disciplines for each stage of higher education. In determining the order of basic competencies, in accordance with the main goals of professional pedagogical education, the essence of social and personal experience, the acquisition of life skills in the process of organizing professional activity in a social society, plays an important role. N.N.Narziyeva notes that basic competencies require constant enrichment of knowledge, learning new information, understanding important social requirements, searching for new information, processing it and applying it in one's activities.

In order for a student to be competent in a professional field, he or she must have the appropriate professional qualifications. Professional competence should be the main driving force of the student, contribute to the student's education, help them succeed in later life, and train them for professional activities.

Professional competence is the acquisition by a specialist of the knowledge, skills and abilities necessary for the implementation of professional activities and their high-level application in practice. Professional competence implies not the acquisition of separate knowledge and abilities by a specialist, but the mastery of integrative knowledge and actions in each independent area.

Competence also requires the constant enrichment of specialist knowledge, the study of new information, the ability to understand important social requirements, the ability to search for new information, process it and apply it in one's activities.

Professional competence is clearly manifested in the following cases:

- in complex processes;
- when performing ambiguous tasks;

- when using contradictory information;
- when having a plan of action in an unexpected situation.

A specialist with professional competence:

- consistently enriches his knowledge;
- absorbs new information;
- deeply understands the requirements of the era;
- searches for new knowledge, processes it and effectively applies it in his practical activities.

The development of professional competence is a set of important activities such as professional training, professional formation and professional adaptation of students. Professional training is interpreted as a specific manifestation of a person's social competence, which arises on the basis of mastering the necessary professional knowledge, skills and qualifications. Professional training does not arise spontaneously, but covers certain stages planned on the basis of specific goals.

The formation of professional training in a person is initially determined by the formation of a professional image and concepts, and then it is explained by the mastery of knowledge, skills and qualifications related to the specialty, the formation of professional qualities and the level of professional adaptation. Professional adaptation is the assimilation of the requirements of future professional activity, adaptation to the process of activity, and the level of professional competence of the future specialist in the conditions of objective and subjective education.

Professional formation is one of the important aspects of personality development, expressing his needs and interests related to the choice of technological and professional activity. The content of professional qualities and their formation are associated with the choice of a specific type of labor activity or professional field, and are an expression of a clear and conscious decision.

In conclusion, professional competence is an important characteristic of professionalism, which can be considered as a unifying personal quality based on a set of basic fundamental scientific knowledge, practical skills that demonstrate the readiness and ability of students to successfully perform their professional activities. The activities of a future specialist in any specialty are important.

For example, to solve professional problems, a future specialist must develop general solutions to the problem, analyze options, predict consequences, find compromise solutions in multi-criteria conditions, deal with uncertainty, improve the project, etc. In doing so, mainly professionally oriented tasks are developed and their place in the educational content is determined. After the forms and methods of teaching are selected, ways of integrating such tasks and professional competence skills are developed. The interrelation of mathematics, computer science and physics helps to develop professional competence and ensures high-quality training of future specialists.

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