

# Basic Requirements to the Method of Teaching Physics

**Ramazonova Fotima Erboevna,**  
Bukhara State University

**Annotation.** The article considers the main requirements for the methodology of teaching physics in conditions when the education system is being reoriented from a knowledge-based to a competence-based approach.

**Key words:** methods of teaching physics, modernization of education, competence-based approach, developmental education.

The goals of education significantly affect the structure of the course being studied, its content, the style of thinking that is formed in the learning process and should influence the methodology of professional training of subject specialists.

The specifics of the training sessions are determined by the specifics of a particular pedagogical system, which the teacher adopts and through which he forms the professional qualities of the teacher. This is what has now set before us the task of a radical revision of the course

methods of teaching physics when using the system of developing education in the educational process, which sets as its main task the formation of the ability for self-education, self-education, self-development, conscious regulation of personal activity [1].

Taking into account the content side of developmental education, we propose the following provisions that should determine the new course in the methodology of teaching physics:

- the goal of this professional complex discipline, which is the methodology of teaching physics, should be determined by the content of the pedagogical system that determines the profession of a physics teacher;

- the principles, methods and techniques of teaching should be filled with content only within the framework of a specific holistic pedagogical system;

- a model of a teacher capable of working on a system of developmental education should be defined, which should include:

- 1) structural components of the teacher's activity; 2) functional components of activity; 3) systemic qualities of a teacher; 4) criteria for the formation of the professional qualities of a teacher; 5) the levels of the teacher's activity according to the degree of her creative activity;

- it is necessary to formulate criteria that determine the possibility and expediency of introducing certain innovative technologies;

- forms of organization of the educational process should correspond to the main objectives of the concept of education;

- in the new content of the course, the emphasis should be shifted from the information volume of acquired knowledge (leading to the suppression of creative thinking) to the structure of thought processes, ways to acquire new knowledge, to the principles of constructing ways to acquire new knowledge, leading to the development of students' creative thinking;

- when developing the effectiveness of teaching and educating students, the emphasis must be shifted from assessing the transfer of accumulated knowledge, skills and other values to the ability to assimilate values and increase them. Independently act and make decisions in non-standard conditions;

- given that the education system is based on the task of developing theoretical and practical thinking, a special role in the course should be occupied by pedagogical heuristics, presented as a didactic system that determines scientific methods and techniques for independently obtaining new meaningful knowledge;

When developing a methodology for teaching a course in general physics, it must be taken into account that the education system is taking serious steps to reorient education from a

knowledge-based to a competence-based-activity approach, which, unlike traditional education, is aimed at acquiring knowledge, skills, practical experience [2] . With this approach, the traditional triad "Knowledge - Skills - Skills" expands to a sextet: "Knowledge - Skills - Skills - Practical experience - Competences". World

the economy has long since switched to a market economy, and vocational education that trains personnel for a market economy is still partially market-oriented.

In the context of the transition to a market economy, vocational education should focus on specialized training of personnel with a high level of professionalism and competence.

Professionalism and competence are the qualities on which success in life and work depends. Today we are talking about the formation of teachers of such professional qualifications and competence, which are determined not by the amount of knowledge available in their arsenal, but by the ability to master them; creatively use them for independent acquisition of new knowledge and for the embodiment of certain ideas in theory and practice.

When talking about professionalism in education, first of all, it means the possession of pedagogical technologies. Competence, in addition to technological training, implies a number of other components that are mainly of a supra-professional nature, but at the same time are necessary today to one degree or another for every specialist. First of all, these are such personality traits as independence, the ability to make responsible decisions, a creative approach to any business, the ability to bring it to the end, the ability to constantly learn. This is the flexibility of thinking, the presence of abstract, systemic and practical thinking, etc.

Despite the fact that professionalism and competence differ significantly from each other in determining the level of training of a specialist, however, the selection and independent consideration of each of them is an abstraction. In reality, these two levels of specialist training are in dialectical unity, and only in their interaction can one holistically determine the formation of a specialist, his level of qualification and education. The selection of these categories as means of methodological analysis allows us to more deeply assess the ratio of these components of the personality of a specialist and determine the vector of their necessary improvement, development at a particular stage of development of society.

In accordance with the traditional division of the content of education into common for all subjects, interdisciplinary for the cycle of subjects and subject for each academic subject, the following typology of educational competencies is currently proposed:

For us, it is of particular importance that in the competence-activity approach, priority among the key competencies is given to competencies in the field of independent cognitive activity based on the assimilation of methods for acquiring knowledge from various sources of information. This gives grounds among various pedagogical systems of education to give priority to personality-oriented developmental education, since its final product is the formation of the ability for self-education, self-education, conscious regulation of personal activity, reflection.

To introduce the competency-based approach into teaching practice, an important aspect is to determine the tools of the very principle of the competency-based approach, which can be the main didactic normative and procedural functions of this principle. Without claiming to be a complete solution to this problem, the following can be distinguished:

- Knowledge of methods and techniques of cognition, the highest examples of cognitive activity. Therefore, the difference between a simply knowledgeable and a competent person lies in the fact that a competent person does not just have extensive and deep knowledge, his knowledge is organized in a certain way to make effective decisions in various activities.
- Conceptual character of knowledge, its development around general approaches, general ideas and general principles. The conceptuality of knowledge acquires an effective character due to its manufacturability: a pupil or student must possess not only declarative knowledge ("What?"), but also procedural knowledge ("How?"). Quick updating of knowledge in the right situation, the possibility of their application in a wide range of standard and non-standard situations. These qualities of knowledge, to a certain extent, are provided by the ability to analyze and synthesize knowledge in the context of solving a particular problem.

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• Possession of educational and cognitive competence should imply that the student understands its significance and value: as an actual factor in the development of his personality, academic mobility; as a promising factor that ensures the continuity of education, obtaining a profession, advanced training, and the formation of professional mobility of the individual.

• Possession of the skills of self-education, contributing to the self-realization of the individual.

• Deployment of project and research activities to create a situation of demand for general educational skills for students to effectively solve real cognitive problems, and develop and consolidate these skills in the mode of creative activity.

• Awareness of a new paradigm that reveals a new vector for the development of society, when the transition from knowledge to action, and, in particular, to technology, should occur as quickly as possible in accordance with the increase in the intensity of life. At the same time, it is obvious that productive creation and effective

The effective use of technology presupposes, first of all, the reorientation of education from a knowledge-based to a competency-based approach.

• Creation of a unified educational space, involving the development and adoption of qualification standards based on a competency-based approach.

• Formation of key competencies, which should be considered as the desired result of education, corresponding to the new requirements of the labor market and economic transformations: learning to know, learning to do, learning to live together, learning to live”.

• Taking into account the state policy in the field of reforming the education system in the country.

• Mastering the experience of forming students' potential for the implementation of complex culturally appropriate activities that form the basis of competence: the experience of cognitive activity, recorded in the form of its results - knowledge; experience in the implementation of known methods of activity - in the form of the ability to act according to the model; experience in the use of scientific methods and techniques of cognitive activity; creative experience

- in the form of the ability to make effective decisions in problem situations; experience in the implementation of emotional value relationships

- in the form of personal orientations.

The discussion of what students should master as a result of general and professional education in the system of competence-based approach suggests that the concept of competence should refer not only to terminology, but also to consider the organization of the educational process, which should take into account new requirements for a formed personality. These are the skills:

- make non-standard decisions, be able to interact with other people, reasonably accept or reject someone's actions;

- put emphasis on strengthening the development of human resources, on which, perhaps today more than ever, the life of modern society depends;

- include the necessary skills, because mastery of competence means the ability to apply existing knowledge and experience in a particular situation;

- switch attention in relation to competencies to the practical situation, where competencies are implemented;

- be included in the field of competencies in two directions:

on activities in the future profession and on current activities, through which the development of the competence of the individual is carried out;

- to orient the new educational paradigm in the sphere of the competence-activity approach, which ensures the development of the individual in the direction of self-education;

- to determine the body of knowledge that is instrumental in nature, is included in the key competencies and includes the necessary elements of history, art, literature, science and technology, providing an understanding of the current situation, the realities of life and the ability to adequately work in real life;

- to form the goals and structure of the competency-based activity approach, in which competencies are not potential (not implemented), but effective;

- to carry out the main emphasis in training and education on the result of educational efforts and activities and to formulate that "at the end of the course, students will be able or will know ...". This approach allows us to single out the following abilities of students as the results of education:

• Understand the key issues of modern life: environmental, political, intercultural interaction and others.

• Navigate the world of spiritual values that reflect different cultures and worldviews, ie solve axiological problems.

• Realize themselves in certain social roles (voter, citizen, consumer, patient, organizer, family member, etc.).

• Solve problems that are common to various types of professional and other activities (communicative, searching and analyzing information, making decisions, organizing joint activities).

• Solve specific problems in the process of professional training, including subject, methodological, methodical, cultural, social and other aspects.

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