

# INTENSIFICATION OF PRACTICE AND LABORATORY WORK IN PHYSICS CLASSES

Jizzakh State Pedagogical University  
Begmuradov Shokhzod

**Annotation:** This article describes the importance and prospects of organizing laboratory work in physics with the help of computer technologies. There are insufficient tools and equipment for demonstration, laboratory, and practical training in the teaching of physics departments and subjects in general secondary schools.

**Key words:** technology, methodology, education, innovation, laboratory, experiment, virtual laboratory, universe, existence.

"Education as the main factor ensuring sustainable development" was recognized on a global scale, and in the international concept of education until 2030 adopted by UNESCO, "creating opportunities for quality education throughout life" was accepted as an urgent task. The implementation of innovative scientific achievements in the educational system is the basis for the development of effective mechanisms for the training of highly qualified specialists, the adaptation of the assessment of the quality of education to international standards, and the achievement of high results in the modernization of the educational system. In particular, the organization of laboratory work in physics classes with the help of computer technologies creates the basis for students' understanding of nature as a whole, and the formation of a single natural- scientific view of the world in their thinking.

"In the concept of development of the system of public education of the Republic of Uzbekistan until 2030, the actual current state of physics education and existing problems are presented, based on the current requirements of STEAM, the lack of attention paid to the integration and practical approach to general education subjects in the education of students at the international level, the insufficient development of educational and methodological support for physics, i.e. multimedia products, didactic materials and other existing problems are identified. In order to solve such problems, in order to ensure the integration of theory and practice in physics lectures in general education schools, the development of a virtual package of demonstration experiments and its application to the educational process serve as an important basis for educating students' creativity and developing their interests.

There are insufficient tools and equipment for demonstration, laboratory, and practical training in the teaching of physics departments and subjects in general secondary schools. Therefore, it is appropriate to introduce existing virtual simulators in the in-depth study of physical phenomena by students. Specially

created visual simulators on the basis of a computer model for each topic are ideal visual models of physical processes and, depending on the professional skills of the teacher, allow the student to imagine the full essence of the physical law. Based on programming technologies in the computer model of physical processes, the addition of many factors serves to develop a natural model of the physical process. A computer model of this physical process ensures the naturalness of the physical experiment being conducted.

It is known that a large set of different models are installed in the virtual environment: measurements of physical quantities, constructions of physical objects, simulators, multimedia environments, etc. They ensure the maximum study of the physical event being conducted, provide the demonstration principle of the physical event. The use of virtual models ensures the ease of teaching, ensures the quality of the educational process, and ensures the acquisition of the necessary knowledge and skills.

A set of ready-made laboratory equipment or accessories is necessary for the determination of physical quantities in the teaching of physics in general secondary schools. Physical quantities to be determined and measured in computer models are entered by software tools. In addition to the demonstration of the physical phenomenon used in the educational process, computer models can be used to teach the essence of the physical law in depth by including other parameters in the phenomenon and the studied process.

There are two components of computer modeling: the process of creating a computer model, the process of using the created model in the educational process, that is, the measurement of physical quantities by modeling a physical object, and the physical the process of confirming the correctness of the formula and the law. Concepts of models in explaining physical phenomena existed before the computer era: material point model, ideal gas model, planetary model of an atom, etc. In creating computer models, a physical phenomenon is taken as an object. The information model of a real physical object is analyzed by an expert. Algorithms of all properties of physical phenomena are created in relation to physical formulas, and the corresponding multimedia program is written, interactive components are created, and the design is adjusted.

Pedagogical software tools are didactic tools designed for partial or complete automation of the educational process with the help of computer technologies. They are considered one of the promising forms of increasing the efficiency of the educational process and are used as a teaching tool of modern technologies.

The development of science and technology and the achievements in the field of information technology allow to solve various new problems facing humanity. Raising the level of quality indicators of the organization of the educational process

in the educational system to the level of world standards, creating a methodology for the widespread

introduction of modern pedagogical and information technologies in our country are considered urgent methodological issues.

The article reveals the features of the technology for the formation of key competencies in laboratory work in physics on the example of the 7th grade from the standpoint of modular learning. Presenting the structure of the laboratory work module, the list of developed modular laboratory works in physics for the 7th grade and the methodology for the formation of key competencies on them.

The concept of a competency-based approach in education implies the effective development of a student, increasing the possibilities of his preparation for adaptation in modern society. It is based on the idea that the source of development is in the student himself, in his subjective experience. With modular education, the student is the subject of the educational process, independently determining the level of knowledge acquisition and actively influencing the course of the educational process, which leads to the creation of a developing educational environment that allows the implementation of individual educational programs through level differentiation of the content of education.

Having considered a number of definitions of the concept of competence, we came to the conclusion that they have in common the understanding of competence as the ability of an individual to solve various problems, applying a set of knowledge, skills and abilities in practical activities. Key competencies can be called those that every member of society should have and which are universal and applicable in different situations (for example, to organize the interconnection of one's knowledge and organize it). At the moment, there is no single approach to defining a set of key competencies. According to the Russian researcher A. V. Khutorsky, the following key competencies characteristic of Russian education can be distinguished: value-semantic competence, general cultural competence, educational and cognitive competence, information competence, communicative competence, social and labor competence and personal competence self-improvement. They are formed in a wide variety of activities, including educational activities, including activities for the assimilation of physical knowledge. The process of forming key competencies in teaching physics is also complex and includes different types of activities, it is essential that the assimilation occurs precisely in the student's independent work, and laboratory research occupies a special place here.

The main result of the application of this technology is that the activity of performing a physical experiment of experiments is transformed from a reproductive-reproducing activity into an activity of a creative, research nature. This ensures the development of students' independence and ability to solve various

problems in practical activities, i.e., the implementation of a competency-based approach.

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