

IMPROVING THE USE OF VIRTUAL LABORATORIES IN TEACHING PHYSICS TO STUDENTS OF THE ACADEMIC LYCEUM

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Abstract. *Organization of specialized training in physics for academic lyceum students is not only an urgent but also a very complex problem. In order to solve it, it is necessary to clarify the purpose of specialized education in physics, its content, develop teaching technology, and determine the characteristics of teacher and student activities.*

Keywords: *physics, laboratory work, virtual laboratory, educational and methodological support, laws, theories.*

For several centuries, exact and natural sciences have been widely developed in the land of Uzbekistan, and the Central Asian region has been the intellectual center of the world. The first and second Renaissance period in our country produced famous geniuses recognized all over the world. Muhammad al-Khorazmi, Ahmad al-Farghani, Abu Nasr Farabi, Abu Rayhan Beruni, Mahmud Koshgari, Abu Ali ibn Sina, Nasriddin Tusi, Qazizada Rumi, Jamshid Koshi, Mirza Ulugbek, Ali Kushchi and other scholars of the East. scientific research made an incomparable contribution to the development of world science.

Respectfully continuing the scientific traditions of our great ancestors, from the 40s of the XX century, in the process of developing physics, prestigious scientific schools were established in Uzbekistan, their representatives received international awards and were elected members of foreign academies. Famous physicists of the Academy of Sciences, who created famous scientific schools, played an important role in the formation of the most important scientific directions. The physics school of our country made a great contribution to world science in the fields of solid state physics, nuclear physics, semiconductor physics, laser physics, and thermal physics.

Today, it is important to improve the quality of physics teaching in educational institutions, to introduce modern teaching methods to the educational process, to select talented students, to prepare competitive specialists for the labor market, to develop scientific research and innovations, and to focus on practical results attention is paid on Decree No. PD-5032 of the President of the Republic of Uzbekistan dated March 19, 2021.

Organization of specialized training in physics for academic lyceum students is not only urgent, but also a very complex problem. In order to solve it, it is necessary to clarify the purpose of specialized education in physics, its content, develop teaching technology, and determine the characteristics of teacher and student activities. It seems that it is impossible to investigate and reveal the features of the listed components of the process of specialization of academic lyceum students in physics in one work.

Issues of improving the use of virtual laboratories in teaching physics to academic lyceum students are of great importance today. The role of these laboratories is incomparable in explaining physical concepts, laws, theories, principles, and theoretical generalizations to students in a comprehensible and systematic way.

Creation of new textbooks and alternative literature, material - taking into account that improving virtual laboratories in academic lyceums is one of the important issues of today, in accordance with the task of developing measures to update technical, laboratory and educational-methodical support, this article focuses on the importance of using virtual laboratories in teaching physics 'attention is drawn as showed in presidential Decree No. PD 5032, on dated 19 March, 2021.

The virtual laboratory is a source of knowledge created with the help of technical tools, transmitted to students through their feelings. In order to use such laboratories, academic lyceum teachers should have a high level of technological competence.

It is known that the criterion of the effectiveness of educational institutions is the readiness of their students to solve increasingly complex problems of scientific, technical and social development. Fulfilling this socially important task is a rather complex pedagogical task.

It is necessary to pay attention to a number of aspects in the process of formation of concepts and their systems in students' mastery of physics, for its successful implementation. These are the following:

- the teacher has a good knowledge of the content of the relevant concept accepted in modern science;
- professional skills of a high-level teacher to form physical concepts in students;
- the teacher's knowledge of the main stages of concept formation, turning points of its development;
- the teacher's ability to determine the initial level of mastery of the concept when organizing the next stage of development of the emerging concept;
- optimal selection of methods of formation of concepts;
- establish connections of the formed concept with other concepts of this and other systems;
- adherence to the unity of pedagogical actions and methodological approach in the formation of concepts;
- increasing the subjective and conscious role of students in mastering concepts during the learning process;
- to ensure continuous use of concepts mastered by students in mental and practical activities.

Here, let's reveal the methodological essence of the concept of "Theoretical generalizations". Local methodologists and psychologists contributed to the formation of this concept. L.S.Vygotsky, A.P.Leontiev, S.L.Rubinstein and his students expressed many opinions.

First of all, A.N.Leontiev notes the failure of associative psychology in its attempts to express the formation of generalizations according to the "classical scheme of formal logic". In fact, behind the generalization lies a special activity, through which transfer, movement of thought from one content to another is carried out. Only in the transition of one concept to another can they reproduce reality together.

In some studies on educational psychology, in this case, the difference in the effectiveness of mastering the learning material, depending on the type of generalization produced, was specifically studied. Let's turn to the experience of some foreign psychologists. For example, according to V.Metzger, increasing the correctness of the concept is associated with significant changes in its content, its "densification" and, at the same time, with the "expansion" that occurs in the process of interconnection of this concept.

In recent years, many works of a general nature have appeared in the philosophical, psychological and pedagogical literature criticizing the established methods of constructing educational subjects. The changes they propose allow us to conclude that researchers are aware of the relationship between content and teaching methods and the theory of cognition and thinking [130].

The first to pay attention to this connection was E.V.Ilenkov critically examined the traditional scheme of education and raised the question of the connection between dialectical thinking and the thinking of schoolchildren [66].

The analysis of logical-psychological, philosophical and general didactic problems of the connection between the theory of thinking and learning was carried out in a number of the above-mentioned works of V.V.Davidov [65]. He developed the concept of formation of scientific and theoretical thinking in personnel training. It consists of the following. The properties of a number of objects are perceived directly with the help of senses, through emotional thinking. These features are compared and contrasted, common, repetitive, important ones are distinguished, and non-repetitive, secondary, somehow unimportant ones (abstraction, process of abstraction) are discarded. Through this abstraction from unimportant features, a process of generalization is carried out, resulting in a mental image - the concept of the objects in question. In the classic psychological chain, "sensation - perception - imagination - understanding" is the last element, and the whole chain is a process of generalization, moving from concrete - intuition to abstract - thinking.

For example, when considering the material objects of the surrounding reality, they first of all do not take into account many of their specific characteristics, for example, chemical composition, belonging to animate and inanimate nature, artificial or natural origin, purpose of use, etc., but a certain group of others, properties and, first of all, materiality, size and shape, density, etc. This is how the concept of the physical body is introduced. In addition, when studying the movement of different bodies, it is necessary to abstract from the difference in their shape and size and focus on finding the position of the body in space - the concept of a material point can be introduced in this way.

Many physical concepts, such as temperature, force, and weight, in their initial introduction, appeal directly to the senses. In this case, visualization is understood as the presence of a sensory image for the included generalization.

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