

TEACHING PHYSICS BASED ON INTERACTIVE METHODS

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Annotation *The article discusses issues of interactive methods that play an important role in increasing the effectiveness of physics teaching, using the example of the molecular physics section of a general physics course. Types of interactive methods, their use, goals and objectives are illustrated with examples.*

Keywords. *teaching physics, effectiveness of teaching science, interactive methods, intellectual potential, effectiveness of teaching, teaching skills.*

The teaching profession, while being an extremely honorable profession, makes high demands on the personal qualities, abilities and interests, character, knowledge, skills and qualifications of the owner of the profession.

In the process of training a growing person, he creates educational conditions for them. The formation and development of students' knowledge needs and abilities increases the responsibility of the teacher. The qualification of a physics teacher should have two sides, covered by special and pedagogical disciplines, and he should always ask "Why am I teaching physics to the student?", "How should I teach physics in quality?" should find answers to the questions, as well as be based on knowledge that takes into account the characteristics of education.

In order to increase the effectiveness of physics education, to ensure that the individual is at the center of education and to ensure that young people learn independently, educational institutions need teachers who are well-prepared and who, in addition to solid knowledge in their field, know modern pedagogical technologies and interactive methods, who know how to use them in the organization of physics training sessions. For this purpose, it is necessary to arm science teachers with new pedagogical technologies and interactive methods and continuously improve their skills in applying the acquired knowledge in training sessions.

At the current stage of development, one of the main ways to develop and update didactic knowledge of physics is to justify the modernity and periodicity of physics education. Theoretical and practical grounding of the teaching of the molecular physics section of the physics course has a positive effect on the expansion of ideas about the process of physics education, the development of views on didactic phenomena.

Физика ўқитиш методикаси - физика фани ўқув жараёнини ташкил этиш ва ўтказиш бўйича тавсиялар мажмуасидир.



Pedagogical technology in physics education is a driving force of the educational process or a complex of activities that renews the professional activity of a physics teacher and guarantees the final result in education in the direction of a predetermined specific goal.

Pedagogical technologies in physics education are based on interactive, innovative methods.

The interactive method in physics education means to strengthen and activate the relationship between the student and the teacher. These methods help to improve the effectiveness of the lesson through cooperation. They encourage students to think independently about physics concepts. Interactive means learning a given topic through interaction between the teacher and students, improving the effectiveness of the lesson, forming the ability to give independent opinion, feedback, discussion. Each student tries to find an answer to the set goal independently, in pairs, in groups, thinks, writes, remembers formulas, speaks, and tries to clarify the issue by means of proofs and bases suitable for his experiences in physics. This will be kept in the memory of the participants for a long time. He can take a critical, analytical approach to learning new information. The physics teacher only acts as a facilitator (guide, organizer, observer).

Physics is an experimental science, so experiments and observations form the basis of physics education at school. But this situation should not lead to underestimation of the role of theory. In the integrated curriculum, emphasis is placed on the demonstration of theoretical issues, experiments, and experiments in teaching physics. Carrying out laboratory work and solving problems ensures the formation of practical skills and competencies in students.

Non-traditional pedagogical technology is one of the central problems of education. Unconventional teaching and learning of physics education, defining and differentiating the dimensions of their separation, strictly limiting the process of educational work will undoubtedly lead to a number of achievements. Expands the possibilities of choosing suitable educational tools for each period. Opportunities are created to make connections between what has been learned and what will be learned; the limit of repetition necessary for complete mastery of this or that educational material is determined; conditions are prepared for the rational movement of education.

We can see the non-traditional technology available in education in the example of the department of molecular physics, which is taught on the basis of the program.

When you get acquainted with mechanics and other parts of the first course of physics, when studying the laws of motion of bodies, they are considered as a whole, integrated body. But the increase in the volume of heated solids, the transition to a liquid state when heating is continued, as well as the transition of liquids to a vapor state when heated, lead to the idea that any solid and liquid substance is composed of small invisible particles - molecules. All aggregates (solid, liquid, gas) are composed of these molecules. The transition of solid substances into liquid and gaseous state, the transition of gases into liquid and solid state, and the transition of liquids into solid or gaseous state confirm this idea. The smallest particle of a substance that contains all its chemical properties is called its molecule.

The science of molecular physics deals with the study of the properties of the movement of a large number of particles - molecules that make up matter, processes such as the transition of matter from one state to another, and their laws.

The concept of the molecular structure of matter appeared in ancient times. But these perceptions were unscientifically based and empirically unproven.

With the beginning of the use of pedagogical technologies in the teaching process, it remains a good option to divide the subjects of the department into a unit known as "teaching element", which can be considered as a small unit of education. In the course of each lesson in the department of molecular physics, learning elements are mastered sequentially. After learning and strengthening the 1st learning element in the initial state, the result is checked and the next learning element is transferred to the 2nd



learning element. The study of the 2nd educational element is organized in the same way. Receiving data and information about the educational element that is required to be mastered; strengthen them; checking for absorption. If there is a deficiency in the students' mastery, the previous information is repeated again, additions are made to the education, and then the study of the 3rd learning element is transferred.

According to the ideas of non-traditional technology of education, information collection, processing, and mastering results are carried out sequentially. The organization of education in the department of molecular physics in this way also increases the possibility of carrying out educational work in stratified groups.

The process of learning molecular physics - learning of students has its own cycles, like natural and social processes. It is necessary to analyze the beginning of the topic, the content of the text of each topic, the interconnection of words and concepts, from the point of view of the stated idea, physical phenomenon, definition and processes, and summarize them.

When organizing the study of the department of molecular physics, the goal, means, and result of the study of the department are intended. In this, the clearly defined goal takes the main place, the means are selected based on this goal, the current results are checked and diagnosed.

According to the requirements of pedagogical technology, the teacher sets four different organizational and management goals in the first period of education: 1. Preparing students to learn a new subject; 2. Organization of learning a new topic. 3. Initial consolidation of a new topic. 4. Testing the learning outcome.

Although vague and incomplete information appears during the study of thermal phenomena in the nature around us, this does not interfere with the process of acquiring knowledge related to the department of electromagnetism. On the basis of this information, a study graph of the studied electrical phenomena was created according to the technology of periodicity. The graph should reflect their characteristics as fully as possible.

- In order to increase the efficiency of teaching the molecular physics department, the teacher can also use the following websites to provide information on the department to students in physics classes:
- <http://physics.mipt.ru/\SII> MetodTD)
- <http://lib.mipt.ru/>
- <http://www.ph4s.ru/>
- <http://www.lib.berkeley.edu/node>, of the department of molecular physics
- information is provided.

The teacher gives information about molecular physics in physics classes

if the Internet information is used in teaching, the students will have additional information about the subject in addition to the knowledge available in the textbook. If these data are used effectively, it is possible to see the improvement of the content of physics education and the increase of the efficiency of the lesson.

The beginning of the mastering process of thermal phenomena is manifested by different stages of mastering acts, educational periodicity, and at the end of the periodicity the period itself is manifested. Periodical acts, goals and means, process results, which are interrelated and require each other in the process of mastering the department, and the results of the process, in turn, form the stages and, finally, the period of mastering the knowledge of the department.

This action should pass a number of didactic periods until it reaches the evaluation of the results of the obtained knowledge of the department, in other words, compliance with the didactic periods remains a necessary condition. The knowledge imparted in the study of phenomena related to thermal phenomena is mainly provided by a sequence of events, such as studying information on the section, processing



them, generalizing two or more concepts and controlling the results of the obtained knowledge. The specified number of reasons can be considered criteria of educational periodicity.

In conclusion, it can be said that the analysis of the objectives of mastering the topics of the thermal physics department includes events from the demands of the society to the education, to the implementation of the demands. The set goals are pedagogical goals, and we distinguish the following forms: the general purpose of mastering the department is formed as a state order in the economic, political, ideological, cultural views of the representatives of advanced thinking of the society, statesmen. There are various types of educational goals of the department, such as organization, management, and control of education. The objectives of learning and teaching are related to the reading activity of the section, which is considered as a characteristic of the next subject of education.

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