FIDEVELOPMENT OF STUDENTS' INTELLECTUAL AND PRACTICAL SKILLS IN ZIKA LESSONS

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Abstract: *The content of the article is to develop intellectual and practical skills of students with the help of basic and science-related competencies in teaching physics and astronomy in general secondary schools.*

Key words: *Physics, technology, labor, competence, technology, astronomy.*

New living conditions make special demands on young people who are entering life: they must be not only educated and skilled, but also thoughtful, proactive and independent. Therefore, the science of pedagogy has the task of developing the thinking of students and the ability to creatively apply knowledge in practice.

As mentioned above, the purpose of education is to develop the student, in particular, his intellect. The basis of this process is his independent cognitive activity. In physics lessons, you can develop in your students: thinking, education, communication and practical skills, moral ideals, aesthetic ideas. Psychologists distinguish the following mental operations: analysis, synthesis, comparison, generalization, classification, systematization, induction, deduction, abstraction, concretization. As part of practical skills, they consider the following: work with books, references; writing abstracts, making observations, creating problems, setting up experiments, solving inventive problems, writing reviews, etc.

There are several approaches, the basis of which is independent cognitive activity.

A research approach to teaching. Its characteristic feature is the implementation of the idea of "learning by discovery". In the framework of this approach, the student himself discovers a phenomenon, law, regularity, properties, a way to solve a problem that was previously unknown to him. At the same time, it relies on the circulation of knowledge: from observation and experiments to the construction of an abstract model (hypothesis), and then the conclusion of theoretical results and their experimental

verification. An example of this type of lesson is where students in groups act as experimenters and try to gain new information about the properties of magnets through an experiment by answering question cards.

Communicative or argumentative approach. It assumes that the student will become the author of some point of view on a certain scientific problem for a certain period of time. In the implementation of this approach, the ability to express one's opinion and understand someone else's opinion, to criticize, to search for positions that combine both points of view, and to find a compromise is formed. "The future of electric power: conventional or non-conventional energy sources?" we will consider the implementation of this approach during the lesson.

Several groups of students are formed, and each of them prepares for the lesson in advance on their topic. The following issues were discussed:

Production of electricity in power plants using traditional energy sources;

Unconventional sources of electricity;

Power transmission problems;

Energy systems and their necessity;

Environmental consequences of the operation of power plants.

A simulation approach. The class is divided into teams or groups, each of them independently performs a common task, simulates a specific institution or company. Then the results of the activity are discussed, evaluated, the best, the most interesting are determined. Protecting projects to improve barometers, issuing a patent for a diffraction grating, "What if ...?" tutorial can be an example of using this approach (for example, drag disappears).

Problem-based learning is a method based on the use of educational problems in teaching and involving students in active participation in solving these problems. Solving the problem begins with its formulation - the first step. In the next step, the student tries to find a way out of the difficulty. In the process of searching for a new solution, ideas, assumptions appear, they are rejected or accepted as working hypotheses. The third stage involves the development of hypothesis testing methods and its implementation.

Often, problem formulation and problem solving are facilitated if the students themselves can be involved in experimental research to discover patterns. For example, when studying the Archimedean force, we will learn together with the class what it depends on. Various hypotheses are put forward: the force depends on the body's mass, size, density, depth of immersion, type of liquid. The class is divided into groups, each of which experimentally tests one of the hypotheses. Summarizing the results of individual groups, they are discussed in turn, and then they draw a general conclusion:

buoyancy depends on the size of the body and the density of the liquid. We form an analysis of mental operation when performing the following types of tasks:

Choosing a parameter that remains constant during the boiling process;

Highlight the examples confirming the dependence of the diffusion rate on body temperature in one paragraph of the textbook;

Analyze the situation of the problem and distinguish the interacting bodies, describe what happens in each;

Show cause and effect in the observed process;

Create a research plan, highlighting the most important stages of the work.

Solving experimental problems requires the ability to plan an experiment, which involves choosing the right equipment, hypotheses, etc. At the first stage of teaching physics, we give students a general execution algorithm, that is, we introduce general principles of experimental knowledge of the world. They represent a chain of questions or "steps" that suggest what to do. For this, we use the sheet "Learning to experiment".

Independent experience of students is successfully used not only as a way to learn new things, but also as a way to consolidate and repeat the material already passed. Creative assignments for a number of laboratory works have been developed. Observations and experiments at home are of great importance: come up with a way to measure the height of a tree; study of charge sign of electrified bodies, etc. To develop this skill, you can, for example, combine two sentences to form one sentence using the conjunction "therefore".

Synthesis helps to develop the ability to:

Making conclusions about the behavior of the body when external influences are compensated from experiments;

After completing a series of tasks, create an algorithm for solving problems in dynamics;

Preparation of a story according to a table, a reference, a drawing;

Completing the task according to the drawing;

Writing an essay or report that summarizes information from multiple sources.

In classification problems, it is required to form a group according to the given criteria from the list of physical concepts:

Choose from the graphs that describe the same accelerated movement;

From the given words, write those that represent the physical phenomenon.

When studying the topic "Light sources", students should fill in the following table based on the materials and messages in the textbook:

Natural light sources

Artificial light sources

In complex multi-classification tasks, students are asked to divide a list of physical concepts into groups, distinguishing their common features based on the comparison of these concepts. For example: meter, degree, power, second, Pascal, etc., which word is redundant? Why did you choose that particular word?

The ability to abstract, that is, to distinguish important features that are important in these conditions, we develop both in individual tasks and in a series of lessons where the model is studied or applied. Building a model of a phenomenon or process means simplifying the real situation in such a way that its main important features are preserved.

The systematization of the cogitative process develops in the creation of a structural-logical scheme of the studied subject, in which the main concepts, laws, formulas and connections between them are defined. The concretization of the operation means the expression, the process in a visual form or improvement. To develop this skill, we use assignments to create drawings, diagrams, and drawings depicting this phenomenon. Many methods of practical orientation are closely related to mental operations.

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