

USE INTERDISCIPLINARY INTEGRATION DIDACTIC FUNDAMENTALS

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Annotation:

The article examines the issue of using an effective teaching system in teaching physics. The importance of didactic methods in this regard is revealed. Particular attention is paid to the effectiveness of integration with other disciplines in the field of in-depth study of physics.

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Educational results depend on the correct definition of the purpose and content of education, as well as on the ways to achieve the goals, in other words, the methods.

The history of didactics and special methods has shown that teaching methods depend on teaching goals and educational content.

The teaching method is a social category, because it depends on the social order of the society to the educational institution. It is known that the educational goals of the younger generation have been changed and supplemented in accordance with the existing social goals and worldview of the society. So, in the early stages of school formation (during feudalism), the only task before students was to master scholastic knowledge. Obviously, the methods used by the teacher are mainly limited to storytelling; students had to perceive information and reproduce it.

In addition, the practical system of teaching methods depends on the educational content. Any change in the content of education - the nomenclature of educational knowledge, their structure also affects the choice of teaching methods. Thus, the principle of generalization had a significant impact on the methodology of teaching physics in general and teaching methods in particular: the role of the deductive method of presenting new material increased; the proportion of teaching methods



that start independent work of students and increase their knowledge activity has increased; teaching methods such as heuristics, research, etc. have become more important.

By following the learning process, you can see various activities of the teacher and students. The teacher explains the new material - this is the method of explanation or the method of storytelling; schoolchildren solve problems - this is a method of solving problems; performing laboratory work - method of laboratory teaching; the teacher uses a demonstration experiment in the explanation process - demonstration method, etc. In addition, one teacher can explain the same material in different classes in different ways:

in one - the method of storytelling, in the second - the method of conversation, in the third - the method of learning frontal work, etc.

At the same time, the same teaching methodology can be organized in a completely different way, depending on the level of expected knowledge activity of schoolchildren and their independence. For example, laboratory work can be done according to the instructions, in which all the steps of the work are indicated, and students only repeat the actions named by the teacher, or you can organize independent research. This will be a research method or an independent work method.

In pedagogy, in addition to the concept of method, there is also the concept of methodical technique. Methodical technique is a detail of the method, a certain concept in relation to the method.

Classification of educational methods

There are different classifications of teaching methods, depending on what is the important feature of the classification in didactics and private methods. Currently, the most accepted methods in didactics are I.Ya. is classified according to the nature of the knowledge activity organized by the teacher and performed by the students during the learning process. Lerner. At the same time, five teaching methods are distinguished:

- 1) explanation and explanation;
- 2) reproductive;
- 3) problem solving;



4) heuristic;

5) research.

The method separation approach can be justified in another way. Methods are determined depending on the methods of mastering the types of educational content. In order to acquire knowledge, it is necessary to organize a conscious perception of information; mastering methods of activity, organized repetition of actions, etc.

The methods in the list, which are usually called general didactic methods of teaching, can be divided into two groups:

1) reproductive (1st and 2nd methods), in which the student acquires knowledge and repeats already known methods of activity;

2) it is effective when the student subjectively acquires new knowledge as a result of creative activity with the help of the teacher (4 and 5).

3) The problematic presentation is intermediate, as it implies both the acquisition of ready-made information and the elements of creative activity at the same level.

It should be remembered that the differentiation of methods does not mean that these methods are separated from each other in the actual learning process; instead, teaching methods are implemented in harmony with each other. Even the division of effective and reproductive methods is very relative. In fact, any creative activity is impossible without reproductive activity. When solving any problem, the student mentally repeats the knowledge known to him. At the same time, if the teacher offers the student to change the purpose or logic of the presentation, the act of reproduction can also contain elements of creativity.

For many years, didactic and private methods have been using the classification of educational resources according to the sources of knowledge. A student can get information from different sources - from a teacher's story, from a book during direct observation or practical activity. Based on this approach, the entire set of teaching methods can be divided into three groups: verbal, visual and practical.

Verbal methods are called methods where words are the main source of knowledge. Story, explanation, conversation, lecture are oral methods, with their help, the teacher provides educational information. Verbal methods include students' work with books (textbooks, educational and popular scientific literature, reference books, etc.).



The group of visual teaching methods includes methods where the main source of student knowledge is observation. Pupils observe, understand, analyze the results of observations, experimental facts, draw conclusions and, as a result, gain new knowledge. The group of visual methods includes, first of all, the demonstration experiment and the illustrative method (using pictures, drawings, tables, mechanical models, transparencies, films, television, video films, etc.). In addition, this group of methods includes excursions, the number of which is very large in physics programs.

Practical teaching methods are solving problems (a method that has a special place in teaching physics) and experimental work of students (laboratory and frontal experiments, physical exercises, experiments conducted at home). In the process of using these methods, students develop experiences in the application of knowledge in the process of solving problems and develop practical skills, such as taking measurements, determining the cost of division and instrument readings, reading and assembling electrical circuits. The results of such work become the main source of students' knowledge and skills.

Based on a holistic approach to education and pedagogical activity (ie, any activity includes organization, motivation and control as integral components). Babansky suggests considering three groups of teaching methods:

- 1) methods of organizing educational activities;
- 2) methods of stimulating educational activities;
- 3) methods of activity monitoring.

The first method group includes oral methods (story, conversation, lecture, etc.), visual (demonstration method, illustration, etc.) and practical (laboratory work, problem solving, etc.). In addition to verbal, visual and practical teaching methods, the group of stimulation methods also includes methods specific to this group, for example: cognitive game method, discussion method, stimulation method, etc. The group of control methods includes various methods of oral and written control - individual and frontal questionnaire, tests, dictations, work with didactic material, home essays, essays and much more.

If we take science methodology as the basis for the classification of teaching methods, then all teaching methods can be divided into empirical and theoretical



types. Empirical methods of education are characterized by such methods as observation, experiment, hypothesis, drawing conclusions from insignificant aspects of an event or process, analysis and comparison of obtained data, induction, generalization and systematization of experimental facts. Theoretical methods of education are characterized by idealization, modeling, thought experiment, theoretical analysis, hypothesis, analogy, deduction, etc. In other words, logical techniques for such classification become integral elements of teaching methods.

The considered classifications of teaching methods are presented in the table

Basis of classification	Method groups
The essence of cognitive activity	explanation is illustrative describing reproductive problems heuristic research
A source of knowledge	Oral Visual Practical
A holistic approach to teaching and learning activities	organization of educational and knowledge activities stimulation of learning and cognitive activity, control of learning and cognitive activity
Scientific methodology	theoretical empirical

There are other classifications of teaching methods in pedagogical and methodological literature. Stages of the educational process, levels of material and knowledge activity of students, logical methods of knowledge transfer, etc. can be taken for classification. Many classifications are combinations of already known systems. All this speaks of the versatility of each style, the variety of stylistic methods used in it. However, it is a system of general didactic methods that is a model of activity norms in training. There can be many methods at special didactic and methodological levels, and the number of methodological methods is practically unlimited.



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