

# IMPROVING THE METHODOLOGY OF TEACHING PHYSICS IN SECONDARY SCHOOLS

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**Abstract.** *This article deals with teaching physics in general secondary schools - oral, demonstrative and practical methods, types of educational tools, as well as effective use of computer technologies in the course of the lesson.*

**Keywords:** *science, technique, method, method, electronic educational resource, technology, information, software tool, visual models, technical tools.*

## INTRODUCTION

Today in the world, on the basis of physics education, the development of professional competencies of students, the use of information technologies in physics education, the large-scale use of virtual laboratory training, interactive software tools, visual models, multimedia electronic educational resources special attention is paid to the introduction of experience-based education. It is becoming important to improve the process and tools for evaluating the quality of education, to generalize the analytical results, and to develop conclusion mechanisms through the visualization of educational services from natural and scientific sciences and the implementation of information technology achievements.[1]

One of the important issues of education at school is to ensure that students master the fundamentals of science, develop their creative abilities, form the correct scientific worldview, ensure that science is connected with life, and educate students with moral and aesthetic education. consists of The level of achievement of the above issues is determined by how the educational and educational work of the school is organized. But the result of these works is closely related to the teaching methods selected in the lesson.[2]

As noted in the literature, methods of activity directed to achieve the educational goals used in the joint interconnected work of the teacher and the student are called teaching methods<sup>1</sup>. The choice of methods and methods depends on the topic that the teacher has to solve in the lesson. For example, one method is used to explain a new topic, another method is used to strengthen it, and another method is used to generalize the topic. It is very important to choose effective methods and methods in the organization of the lesson.

Several methods of teaching are presented in the literature related to the study of physics teaching methodology. In particular, pedagogic scientists have proposed several methods for classifying teaching methods. For example, T. A. Ilina summarized the classifications of scientists, Yu. He approved the classification of K. Babanskyi and recommended the following method of classification:

— explanation, story, school lecture methods used to impart new knowledge (relying on the teacher's words);

- methods used for acquiring new knowledge and forming solid skills: conversation, excursion, experiment and laboratory work, working with textbooks and books, lessons, exercises;

— methods of working with technical tools that can be used at each stage of the lesson;

- independent work.

In the practice of teaching physics, it is common to divide teaching methods into categories depending on the teaching tools used, and they are divided into the following groups:[3]

1) oral (story, explanation, lecture, conversation; they may have a problematic and inappropriate character);

2) demonstration (the teacher shows real and model experiences);

3) laboratory (frontal laboratory work, home experiments and observations, physical practicum);

4) working with books and manuals;

5) problem solving (qualitative, quantitative, experimental, graphic, etc.);

6) use of pictures, posters and various OTV;

7) methods of control and accounting of knowledge, skills and abilities.

Based on the above, we can divide teaching methods into three main groups: oral, demonstration and practical methods.

Verbal method - information is explained using words through experiments and demonstrations. This method can include stories, lectures, explanations, interviews, tele-stories, tele-lectures, working with books, and the main source of knowledge is given through words.

Information is explained in a visual way - by showing events and processes. In this method, the teacher guides the students' thinking and observations with the help of words, and explains different aspects of the phenomena. A visual method is organized through experiments, schemes, slide films, paintings, drawings, films.

The practical method includes problem solving, laboratory work, practical work, working with handouts and various practical assignments. In this method, students acquire skills such as solving problems, applying theoretical knowledge in practice, conducting experiments, and measuring together with acquiring new knowledge.

In many cases, the selected method is additionally combined with other methods and forms a whole system of methods. In physics classes, demonstration methods are the basis, while other methods, i.e. oral, practical and independent work methods, serve as auxiliary methods. Of course, these methods and methods are organized with the help of educational tools. Educational tools help to visually present the educational material and at the same time increase the effectiveness of teaching.

In the teaching of physics, educational tools can be divided into the following three types: technical teaching tools (TTV); auxiliary educational tools (YoTV); educational - methodical materials (UUM).

Technical means of education (TTV) - helps to demonstrate the educational material and its systematic delivery; allows students to understand and remember the learning material well.

Educational aids (YoTV) – graphs, drawings, samples, etc. etc.

Educational - methodical materials (OUM) - educational materials, exercises to strengthen the acquired educational materials. These help to activate students' independent work.

The selection and use of all kinds of educational tools that help to accelerate the learning and cognitive activities of students depends on the following: 1) setting the goal; 2) to the main source of knowledge; 3) to the method of education; 4) novelty and complexity of educational material; 5) educational opportunities for students.

Classification of educational tools

Technical means of education: slide projector, overhead projector, blackboard notepad, blackboard stent, flip chart, video films, writing board.

Educational aids: model, dummy, graph, diagrams, drawing, scheme.

Teaching methodical materials: worksheet, notes, checklist, pictures.

**INTERACTIVE TOOLS:**

Internet portal.

Video and audio conferences.

E-mail education.

Remote control systems.

Online stimulants and training programs.

Test submission systems.

**NO-INTERACTIVE TOOLS:**

Video, audio and printed materials.

Computer, video projector, interactive board.

Television and radio shows.

Programs located on disks.

Also, multimedia applications and electronic educational resources can be included in the demonstration methods. The use of electronic textbooks, electronic manuals, and other visual aids for the science of physics serves to illuminate the content of the lesson. It is appropriate to use these tools for observing physical phenomena, conducting experiments, performing practical and laboratory exercises, and self-control of students.

Demonstrating the essence of phenomena based on experiments in physics lessons with the help of special tools is called an educational experience. Such experiences are simultaneously a source of knowledge, a teaching method and a type of demonstration. Studying phenomena on the basis of physical experiments forms the scientific outlook of students, deepens their understanding of physical concepts, theories and laws, and increases their interest in science.

School physics experiments are divided into four types: demonstration experiments (performed by the teacher), laboratory experiments (performed by students), physical practice, extracurricular experiments, and observations. The general didactic requirements for the experiments are as follows: they must be demonstrative, including the ability to distinguish human organs, they must be safe, reliable, simple, time-limited and modern. [3]

**CONCLUSION**

Also, in the era of the development of current information and communication technologies, it is possible to model physical processes with the help of a computer. Computer-based classes are more convenient than traditional classes.

The peculiarity of modeling is that in such lessons it is not necessary to prepare physical devices and tools, it is possible to describe phenomena in a live and natural way, to repeat them as desired, to perform them in ground conditions, and to observe processes that cannot be observed.

With the help of information technologies, it is possible to animate invisible, fast and extremely slow processes, complex phenomena.

The computer can be used in any kind of teaching, so it is necessary to know when and how to use it in order to achieve a positive result in its use.

The lesson conducted with its help is much more effective than ordinary lessons, and it helps to complete study plans on time.

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