

The Emergence, Development and Current State of the Subject Methodology of Teaching Physics

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Abstract: *The method of teaching physics is a pedagogical science, which is a transposition of the principles of didactics for teaching the subject of physics. As a science, the methodology of teaching physics has a specific subject of research and research methods. The subject of physics teaching methods should be understood as the theory and practice of teaching physics, education and development of students in the process of teaching physics. The task of teaching physics methods is to find answers to three main questions: why teach, what to teach, and how to teach physics. The answer to the first question involves the formulation of learning objectives. Its content (what to teach) is directly dependent on the goals of learning. Answering the question of how to teach physics, we choose methods, means and organizational forms of training that correspond to the goals of learning, which depend both on the goals of learning and on its content[1].*

Keywords: Visual method, Practical method, Explanatory, illustrative, Demonstration experiment, posters, tables, diagrams, statistical projections.

INTRODUCTION

The goals, content, methods, forms and means of teaching form a methodological system in which the goals of teaching play a leading role, determining the strategy of pedagogical activity. Methods, means and forms of training in their interconnection constitute the technology of training. Physics as a secondary school subject has the following tasks:

- study of the foundations of the science of physics;
- development of cognitive and mental abilities of students;
- formation of a modern scientific worldview;
- preparing students for a conscious choice of profession;
- education of students[2].

The functions of the academic subject of physics are implemented in the educational process, which is determined by four components:

- content of training;
- teaching;
- study of;
- material means of training.

The worldview can be divided into natural-scientific, social, humanitarian and epistemological aspects. The physics course is designed to form the foundation of the natural scientific and epistemological aspects of the worldview. In accordance with this, several components (directions) of the formation of a worldview in teaching physics can be distinguished:

1) the formation of a system of generalized, philosophically sounding knowledge about nature and its cognition by man. With the dialectical-materialistic approach, three groups of philosophical generalizations are included in the foundation of the worldview: the ideas of matter and motion, their interconnection, indestructibility, non-creation, spatio-temporal existence; ideas of the universal connection of phenomena, the existence of certain laws of dialectics, which govern the movement of matter; the category of truth in all its aspects, the laws of the process of cognition.

2) the formation of views and beliefs that correspond to the dialectical-materialistic understanding of nature and the process of its cognition.

3) the development of dialectical thinking of students (unity and struggle of opposites[3-5].

METHODOLOGY

The use of modern information and communication technologies in the educational process. Basic concepts and definitions of the subject area - informatization of education. Goals and objectives of using information and communication technologies in education. Information and communication technologies in the implementation of information and information-activity models in teaching. Information and communication technologies in enhancing the cognitive activity of students. Information and communication technologies in the implementation of the system of control, assessment and monitoring of educational

achievements of students[6]. Methods of analysis and examination for electronic software, methodological and technological tools for educational purposes. Methodological aspects of using information and communication technologies in the educational process.

RESULTS

Physics teaching methods. The concept of a method and methodical reception. Classification of teaching methods. The relationship between teaching methods of physics and methods of natural science.

Explanatory and illustrative, reproductive teaching methods, problem presentation, heuristic, research teaching methods. Verbal teaching methods: story, explanation, conversation, lecture, work with a book.

Visual methods of teaching physics. Demonstration experiment, its implications in teaching, methodological requirements for it. Drawings and drawings in physics lessons, methodological requirements for them. The technique of using posters, tables, diagrams, statistical projections in physics lessons. Methods of using films, video films, software and pedagogical tools in teaching physics.

Practical methods of teaching physics. Solving problems in physics, their functions in the educational process. Classification of problems in physics and methods for their solution. Methods of teaching students to solve physical problems. Educational physical experiment of students: frontal laboratory work and experiments, physical practice, home observations and experiments. Calculation of measurement errors in laboratory work.

Methods for organizing and implementing educational and cognitive activities. Using induction and deduction to explain new material in physics. Independent work of students in physics with a textbook, reference book, anthology, didactic materials, popular science literature, etc., its types and meanings[7]. Methodology for organizing students' independent work.

Methods of stimulation and motivation of educational and cognitive activity. Methodology for the formation of cognitive interest in physics and the activation of the cognitive activity of students.

Methods of control and self-control of the effectiveness of educational and cognitive activity. Diagnostics of personal, metasubject and subject achievements of students. Drawing up test assignments based on element-by-element analysis of educational material.

CONCLUSION

Methods for testing and assessing the knowledge and skills of students. Methodology for organizing testing and assessment of knowledge and skills of students in physics.

Forms of organization of training sessions in physics Types of organization of forms of training sessions in physics: lesson, seminar, conference, excursion, homework, their characteristics. Types of physics lessons and their structure. A modern physics lesson, requirements for a modern lesson. Repetition, systematization and generalization of students' knowledge in physics. Methods for conducting seminars and conferences in physics. Organization and method of conducting excursions. Methodology for organizing homework of students in physics.

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