

PREPARING STUDENTS FOR USE OF SCHOOL PHYSICAL EXPERIMENT IN THE PROCESS OF TEACHING PHYSICS

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ABSTRACT

This article describes some of the problems of preparing students for the use of a school physical experiment in the process of teaching physics. These theoretical and practical ideas can be used by teachers in teaching the subject of physics, students and students interested in physics. It is recommended as a practical and methodological indication for young teachers in organizing students' independent work in groups and individually, using modern information and pedagogical technologies in the educational process.

Keywords: General education school, methodology, training system, physical experiments, educational process, material technical base, educational system, vocational training, implementation, educational physical experiment, software, experimental training, educational process, learning efficiency, practical skills, Society, scientists, teacher.

INTRODUCTION

In the education system, including in secondary schools, the problem of the development of an educated person who has systemic knowledge about the world, obtained as a result of an independent analysis of the surrounding reality, mastered in his own experience, creatively transformed and turned into a personal asset, becomes urgent.

Society, scientists and teachers are beginning to realize that the traditional system of education in a general education school, aimed mainly at the formation of knowledge, abilities, skills, training, does not cope with the above task.

Materials and Methods

The system of preparing students for teaching physics at school in conditions of differentiated education includes a number of subsystems: special training, psychological and pedagogical, etc. One of the subsystems is methodological training, in which, for various reasons, its own subsystems are distinguished: training students on general issues of teaching methods in physics, training on various particular methodological issues, etc. It also includes the methodological preparation of students for a school physical experiment.

Analysis of works devoted to the problems of teacher preparation for work at school allows us to single out the following approaches that play the role of principles and form the theoretical foundations of the methodological training of students in the field of school physical experiment:

- Holistic,
- Systemic,
- Individual and personal,
- Active

The training under consideration is a system, and a multidimensional system, since system-forming signs can be distinguished on different grounds.

First, like any methodological system, it includes the goals, content, methods, forms and means of teaching. These components of the system are interconnected and affect each other.

Secondly, the preparation of students in the field of school physics experiments begins simultaneously with the course of teaching methods in physics, continues throughout the entire period of study of this subject, assumes a gradual expansion of knowledge and an increase in their level, i.e. the transition from the acquisition and reproduction of knowledge (reproductive level) to the ability to apply them in certain situations (productive level) and further to the creative application of knowledge (creative level). Thus, the preparation of students in the field of school physics experiment consists of several levels, each of which is characterized by its own goals, content, methods and means.

Thirdly, some knowledge and professional skills in the field of school physics experiment are formed in all students, others - in the group, a number of skills are formed in individual students.

The individual-personal approach reflects the idea of humanizing the learning process in higher education and involves taking into account the individual characteristics, interests and inclinations of students in teacher training.

Results and Discussions

An activity-based approach to teacher training involves the involvement of students in independent creative work to study and develop certain issues, creating opportunities for them to apply the knowledge gained in practice.

Within the framework of this approach, the formation of students' professional skills in the process of studying the course of a laboratory methodological workshop should be carried out as follows;

1. Organization of different forms of classes related to the nature of the educational activities of students. The educational activities of students in the process of methodological preparation within the framework of a laboratory workshop should include both classroom and extracurricular (preparation for classes in the process of doing homework, work with educational-methodical and psychological-pedagogical literature, identifying problems and issues related to the topic of classroom studies in the process of teaching at school, the development of an "author's" educational experiment, etc.) forms.

2. Organization of active forms of students' work, providing for individual and group activities. In the context of the problem under consideration, this means a wider introduction of discussion forms of work into laboratory practice, the presentation of fragments of lessons on a competitive basis, a discussion of the didactic resource of devices, the expediency of using information technologies, etc.

3. Conducting pedagogical practice at school as a physics teacher, testing theoretical knowledge about the use of school physics experiment in teaching physics to students of classes of various profiles in real conditions. The formation of a model for preparing a teacher for the use of a school physical experiment in the process of teaching physics in classes of various profiles should begin with its goals, which are determined by the school's requirements for teacher training or by the content of those professional tasks in the field of school physics experiment that a physics teacher should be able to solve in the implementation of specialized education. Based on the analysis of the theoretical foundations of differentiated teaching of physics and pedagogical practice, we distinguish the following professional tasks of a physics teacher in the field of school physics experiment.

The cycle of laboratory work on the sections of the course "General Physics" is developed in accordance with the model of preparing students for teaching physics in a specialized school in a laboratory workshop on the theory and methodology of teaching physics.

The general structure of the organization of classes in the second stage of student preparation, dedicated to the study of the role and place of the demonstration experiment in physics courses of various training profiles, includes the following elements:

- Study of the demonstration equipment in terms of the specifics of its use in experimental installations to achieve various learning goals;
- Analysis of educational and methodological kits in physics for various profiles in order to develop school physics experiment systems on various topics for specific training profiles;
- Analysis of pedagogical situations involving the use of school physics experiment;
- Discussions on the results of presentations of the studied situations.

For the successful conduct of classes at this stage, the methodological laboratory of the university must be equipped with a full set of demonstration equipment, according to the Lists of the minimum necessary educational equipment in physics for a secondary school, approved by the Ministry of Education, a minimum list of equipment for the General Physics course required for work is presented. In the event of a change in the subject of classes, which is possible with a different curriculum, the list of equipment should be adjusted in accordance with this change. In addition, the laboratory should be equipped with hardware and software that include the most common training programs.

The method of teaching at this stage in the proposed model can serve as the method of analysis of situations, on a brief description of the main types of analysis, classification of situations, types of presentation and assessment, which we used in developing a cycle of laboratory work on the course "General Physics".

As the main types of analysis, in this case, assumed in the preparation of pedagogical situations using the school physics experiment course "General Physics", the constructive systemic, praxeological and program-targeted analysis were chosen. Constructive system analysis involves determining the structure of the system for given goals and functions, praxeological analysis is aimed at diagnosing the content of an activity in a situation, its modeling and optimization, and program-target analysis provides for the development of programs of activity in a given situation.

CONCLUSION

In conclusion, we consider the methodological training of students in the field of school physical experiment as part of a more complete system of their methodological training.

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