

## **DIFFERENTIAL LEARNING IN PHYSICS**

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### **ABSTRACT**

The article outlines the priorities of organizing physics education on the basis of a differentiated approach to the development of the intelligence of trainees.

**Keywords:** Education, method, differentiation, intellect, interest, ability, science, skill, worldview.

### **INTRODUCTION**

Currently, more and more attention is paid to the introduction of new, non-traditional teaching methods in the education system, as well as modern pedagogical technologies that teach students how to find, learn and draw conclusions.

These non-traditional methods should be aimed at the acquisition of active and independent knowledge, the development of thinking and the development of scientific views. It is also necessary to pay more attention to scientific and methodological activities to increase the effectiveness of the educational process.

Currently, the education system is one of the main and priority tasks of educational institutions for the development of students' abilities in each subject in each subject. It is not enough to equip students only with knowledge and skills.

In the context of modern globalization, the training of highly qualified personnel and the training of modern competitive specialists meeting the requirements of SES, the education system poses a number of tasks. Research and studies have shown that traditional education, based on the active work of the teacher in the classroom and focusing only on the idea of unification, aimed at obtaining ready-made knowledge, is not justified in practice. [1]

Currently, the social order of education in the community has undergone fundamental changes: it is designed to provide each student with a wide range of opportunities to achieve the specific goals of education, taking into account his interests, abilities and aspirations. The education system serves as a tool for the implementation of social order in the context of educational development tasks.

The best way to take into account the interests, abilities and aspirations of students in physics is to differentiate the educational process.

Creating an environment conducive to learning is a key task for educators to develop their abilities and interests.

According to some scientific and pedagogical studies and research, literature and articles, there are certain problems in the fundamentals of differentiation in the teaching of physics.

### **Materials and methods**

According to scientific and pedagogical research and the results of scientific and applied research, the ability of students in the class to recognize and assimilate is not the same. Their personal qualities, abilities and interests depend on the family environment. In addition, the educational content that students must study cannot be correlated with the perceptions and abilities of each of them. Because every student in the class has different abilities. It is difficult to find two students with similar abilities. The knowledge and skills provided to students in the program are in line with the skills of some students, while others are unheard of and are a burden for many other students. As a result, students with the same educational content and the same complexity of knowledge and skills do not provide their dynamic development. Accordingly, it is proved that the idea of organizing the educational process on a unified basis is not justified, differentiating students in the classroom in accordance with the level of knowledge, abilities, assimilation and understanding of students in the learning process.

We believe that the required level of knowledge will not be achieved if students do not develop a differentiated approach in the lesson and preliminary knowledge is not formed. Especially in the process of physics education it is advisable to identify students' interest in science and organize the educational process, differentiating them from different levels of concepts, knowledge and quality level. In addition, if the learning process is based on a differentiated approach to the interests of students, their activity will increase, their knowledge will increase, their interest in science will increase, their independent and free thinking will be developed, and their knowledge will be systematized.

In pedagogical history, the differentiation of education has always been relevant. In particular, one of the didactic principles of teaching the great Czech teacher Jan Comenius in the Great Didactics is reflected in the Understanding principle.

Differentiated learning is a learning process that governs the cognitive functioning of the student and student in a particular system. The organization of training based on the interests, abilities, consciousness and knowledge of pupils and students is a differentiated education and is an educational tool of pedagogical science.

The main goal of differentiated teaching is to increase the effectiveness of the educational process and to meet the needs of students in improving their knowledge, skills and abilities.

Its main task is to determine exactly what criteria should be adopted in order to ensure a high level of training for students to ensure a high quality educational process. Differentiation is the social essence of education, on the one hand, the formation of creativity, hard work, initiative and creativity for each student. [2]

The methodological basis of differentiated teaching is the humanization of education (showing respect and love for the student, helping him, faith in his or her creative abilities, complete rejection of rape) and democratization (equalizing the rights of the student and teacher, free choice, mistake). This gives each student the opportunity to learn from a pedagogical and psychological point of view, based on their interests, abilities and needs.

### **DISCUSSION**

The process of teaching physics is a complex process in its features. An interesting process of differentiated learning can lead to a better understanding of topics, as well as to a more active

interaction between students and teachers. It also meets the main goals and objectives of education, which meet the requirements established in state education standards and ensure high efficiency.

The organization and conduct of differentiated training requires a large amount of methodology, research, knowledge and initiative from the teacher of physics. This requires the development of all methodological mechanisms of classroom technology and the development of a lesson scenario. Otherwise, the expected positive effect will not be achieved.

The time spent on differentiated tasks during the course requires a lot of skill from the teacher. However, an important task of a teacher is to develop students' interest in physics. Therefore, it is necessary to provide all possible opportunities to meet the needs of students interested in physics.

**Result**

In short-term experience, a differentiated learning process has been applied to students. As for the control group, the experimental group differed significantly in aspirations, interests and levels of knowledge of students and achieved positive results. In particular, the results of the analysis of students' knowledge, when the experimental work was initially carried out in experimental groups, showed that they possessed extensive and deep scientific knowledge in educational materials in physics. You can see it in the table below.

№	Experimental groups				Control groups			
	Assessments							
	fine	well	satis- factory	unsatis- factory	fine	well	satis- factory	unsatis- factory
1	20	42	38		5	25	52	18
2	28	40	32		5	2	69	24
3	22	37	38	3		30	52	18
4	26	33	41			8	65	27
5	18	48	34		2	28	62	8
6	16	49	35		4	27	52	17
7	14	48	34	4		30	51	19
8	20	37	40	3	3	4	70	23
9	13	38	41	8	2	26	60	12
10	19	43	38			24	53	23
Average mastering	19.6	41.5	37.1	1.8	2.2	20.4	58.6	19

**CONCLUSION**

Increasing students' knowledge, improving the quality of education and high efficiency can be achieved by applying a differentiated approach to learning, which is an unconventional way of teaching students to achieve the required results of physics training:

- Targeted learning activities for students to improve their knowledge;
- development of scientific and methodological foundations of a differentiated approach to solving problems and laboratory studies, purposeful organization and development of educational activities;
- introduction of pedagogical technologies and non-traditional methods in physics, as well as the use of modern information technologies in education;
- experimental and effective use of experimental methods to help students gain knowledge of physics in the learning process;
- if the learning process is properly organized in teaching students:

In addition, if the educational process is based on a differentiated approach to the interests of students, their activity will increase, their knowledge will increase, their interest in science will develop, their independent and free thinking will develop, their knowledge will be systematically generated.

With the introduction of a differentiated approach to the process of physics, students' knowledge will grow, their level of knowledge will grow, their abilities will develop, and their thinking will be more relaxed. The deeper the subject is studied, the better the student's understanding and assimilation. The teacher will be able to use various forms, methods and techniques to explain complex concepts of the topic, especially in solving problems, as students understand and accept the ideas put forward by the teacher. [3]

In conclusion, differentiated teaching is based on a general didactic principle, which ensures the specialization of the learning process in homogeneous groups of students. It requires the student to realize his abilities and fulfill the requirements of the modern educational process.

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