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THE EFFECTIVENESS OF NEW PEDAGOGICAL TECHNOLOGIES FOR IMPROVING OF PROFESSIONAL COMPETENCE OF STUDENTS IN TEACHING PHYSICS

ESHTUHTAROVA ORZIGUL SHONAZAROVNA
Jizzakh State Pedagogical University
Sharof Rashidov, 4, Jizzakh 130100, Uzbekistan
eshtuxtarovaorzigul@gmail.com

Abstract

Today, with the rapid introduction of information and communication technologies in the educational process, it remains one of the most favorable factors in increasing the effectiveness of education. Bringing the education system up to world standards is one of the important tasks of the modern education reforms. In the process of advanced training, a computer science teacher gives special courses on informatization and education management, and also masters innovative pedagogical and information and communication technologies, new software tools, creative activity in their use, creativity, studies the development of topics in the field of science on the use of innovative pedagogical technologies and interactive methods, as well as the wide promotion of their innovative activities.

Keywords: *formation of culture, training and education, environmental education, advanced training, software tools, innovative pedagogical technologies*

Introduction

Currently, in the conditions of a modern school, the teaching methodology is going through a difficult period associated with a change in the goals of education, the development of a state educational standard of a new generation, built on a competency-based approach. According to the researchers, the modern period of the development of education is characterized by the fact that the traditional educational paradigm no longer satisfies the requirements set by society for modern education. The main reasons for this are the acceleration of the pace of development of society, the change in the situation on the labor market (the emergence of new professions, the need to change jobs, lifelong learning, etc.), the increase in informatization processes. There was a need to form such personality traits that would allow her to become proactive, independent, competent (in the broad sense of the word). The development of pedagogical science has led to the fact that the school has a new educational goal: to form key educational competencies in students.

Difficulties also arise due to the fact that the basic curriculum reduces the number of hours for the study of individual subjects, including the disciplines of the natural science cycle. All these circumstances require new pedagogical research in the field of methods of teaching subjects, the search for innovative means, forms and methods of training and education

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related to the development and implementation of modern educational and information technologies in the educational process. The introduction of new pedagogical technologies in the educational process requires not only the student's adaptation of his psychological readiness to new ways of learning, but also a change in the teacher's attitude to the learning process, a change in behavior style so that there is a situation in which the student learns himself, and the teacher exercises control learning. To change the attitude of students to knowledge, it is necessary to change the conditions for acquiring this knowledge. The role of the teacher is not to communicate information more clearly, more understandably, more colorful than in a textbook, but to become the organizer of cognitive activity, where the student becomes the main character. The teacher must organize and manage the learning activities of the student. And this can be realized using various educational technologies that are adequate to the tasks. It is the use of pedagogical technologies in the work that increases the efficiency and effectiveness of the educational process.

Modernization of the education system is impossible without new ideas, approaches, modern technologies. In order to consciously and reasonably choose pedagogical technologies, it is necessary to understand their essential characteristics, real possibilities. At present, it is necessary to completely abandon the idea of the educational process as a process of information transfer. Modern teaching at school is faced with the problem of reducing the interest of students in the study of subjects. Society has long classified such a school subject as physics as the most difficult. The teacher is faced with the task of arousing interest, not scaring off the children with the complexity of the subject, especially at the initial stage of studying the course of physics. Over the past decades, there has been a gradual decline in the interest of schoolchildren in the subjects of the natural cycle.

- Such a phenomenon in the conditions of the scientific and technological revolution and the expanding process of informatization of society seems paradoxical.
- Some refer to the fact that they will not need these items in the future.
- Others believe that the lessons study issues that they already know from books, magazines, and television programs.
- Still others complain about the complexity of subjects, they do not see much point in forcing themselves to learn the wording and puzzle over tasks.
- The idea is often expressed that these are rather special subjects that are not needed by one hundred percent of the population, and therefore they should be studied at a school of choice.

The purpose of pedagogical activity is to create conditions conducive to the development of a versatile personality capable of carrying out productive and conscious activities. It is necessary to organize the educational process in such a way that it provides favorable conditions for all students to achieve a basic level of training that meets the State Standard. The main task of pedagogical activity is aimed at creating such an educational environment in physics lessons that contributes to the self-realization of students, improving their educational level, the formation of communication skills, creative thinking, and cognitive activity. We try to create favorable conditions for all schoolchildren to achieve a basic level of training that meets the state standard. All this makes it possible to develop the personality of the student in accordance with his abilities, interests and opportunities, and students to achieve

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certain success in their studies and the implementation of their plans for further education.

The use of a wide range of pedagogical technologies makes it possible to use study time productively and achieve good learning outcomes for students.

Creation of problem situations in educational activity and organization of active independent activity of students to resolve them, as a result of which there is a creative mastery of knowledge, skills, abilities, mental abilities develop.

The results and discussions

The essence of the method of problem-based learning is that you can design your own or borrow a research task designed by others, and the student is looking for a way to solve it. Problem tasks of varying degrees of complexity, each with its own search field. In difficult cases, students need to be helped, but in a way that preserves the possibility of creative thinking. The problematic task is different in that it is possible to deliberately provoke the creation of contradictory situations, giving rise to the students' desire to understand and eliminate them.

Traditional education, as a rule, provides students with a system of knowledge and develops memory, but is little aimed at developing thinking, skills of independent activity. Problem-based learning eliminates these shortcomings, it activates the mental activity of students, forms a cognitive interest.

Depending on the nature of the problem statement, there are several types of situations. In the process of explaining new material, situations of inconsistency and surprise are most often used. Accumulated, generalized and systematized tasks of a problem orientation in various sections of the course of physics. For example, if a student is engaged in tourism, then in the real conditions of a hike, he can get a holistic view of the physical laws that will allow him to ensure safety in extreme situations; what kind of pot and how should be placed over the fire so that the water boils faster; what knot should be tied on a rope in order to provide reliable insurance; what size and what weight should the stove be in order to ensure safety when skiing, etc.

The use of elements of problem-based learning allows you to create conditions for the creative mental work of students in the classroom. There is no need for mindless memorization of a large amount of educational material. The time for preparing homework is reduced, since the main part of the educational material is learned in the classroom.

The degree of cognitive activity of students in the classroom depends on what methods the teacher uses in the classroom. Problem-based learning acts as one of the most important pedagogical technologies that ensures the emergence of a motivational component of the educational and cognitive competence of students in physics lessons. This technology attracts me with its originality, opens up great practical opportunities for students, contributes to the development of creativity, overcoming the passivity of students in the classroom, and improving the quality of knowledge in the subject. When using this technology, the principle of knowledge correction and their level differentiation is implemented, which makes it possible for students to learn not only the standard of education, but also to move to a higher level.

Today, information and communication technologies occupy an increasing place in the educational process. The main advantage of these technologies is visibility, since a large proportion of information is acquired with the help of visual memory, and the impact on it is very important in learning. Information technology helps to make the learning process creative and student-centered. It is noticed that students show great interest in the topic when

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presentations are used to explain new material. Even passive students with great desire are included in the work.

Presentation lessons play an important role. They implement the principles of accessibility, visibility. They are effective in their aesthetic appeal; between the teacher and the student there is an intermediary - a computer, which contributes to effective interaction. Lesson ¨C presentation also provides a large amount of information and assignments in a short period. In addition, you can always return to the previous slide. An ordinary school board does not contain all the information needed for a lesson. The slide makes this possible. The use of information technologies in the educational process makes learning more meaningful, spectacular, contributes to the development of independence and creative abilities of the student, significantly increases the level of individualization of learning.

The method of projects allows to realize the versatile development of children, their creative interests, creative abilities, self-education skills, helps to create conditions for the creative self-realization of the individual.

The method of projects, as a pedagogical technology, is focused on the independent activity of students, which they perform for a certain period of time. Creating projects allows students to fully reveal their creative abilities. Working on a project develops stable interests, a constant need for creative searches, because interests and needs do not arise outside of activity.

Using the technology of the project method in training, the following goals are pursued:

• to teach students independent, critical thinking;
• to think, relying on knowledge of facts, laws of science, to draw reasonable conclusions;
• make independent reasoned decisions;
• to teach to work in a team, performing different social roles.

Project activity allows involving all students in educational work, stimulating students to creative activity, contributes to the emergence and development of active interaction between the teacher, his students and information technology tools.

The work on the project is structured as follows:

Students identify an actual problem to be worked on individually or in groups. Then they draw up a work plan, determine the objects of study, and look for possible solutions. Hypotheses are put forward, the data obtained from various sources of information are systematized and summarized. The results of the work are summed up.

The children present reasoned conclusions, process and draw up the results, learn to solve cognitive and creative tasks. The defense of the project is being prepared. At this stage, the guys independently prepare a presentation, a booklet of the project using a computer. Protection of the project: presentation of the result of their activities, ways of solving a problem, proving the correctness of solutions. Thus, the work of schoolchildren on a project requires them to: be able to navigate independently in the information space, in a variety of software products; skills in working with various software tools necessary for the organization of the study,

project design. The skills of students to master the information culture and the culture of communication develop, theoretical thinking develops, cognitive skills are formed, the ability to independently solve problems and problems.

The organization of project activities of schoolchildren using basic information technologies provides for the active cooperation of students in the development of educational projects and their support with electronic materials in the form of presentations, publications and websites,

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which allows evaluating the results of each participant's work.
Working on a project using information technology helps the student to form a cognitive motivation for learning activities; the ability to isolate the problem, with its subsequent solution; the ability to analyze the results obtained from the point of view of solving the identified problems and allows you to publicly defend the work, prepare reviews and reviews of the programs provided and their description, evaluate the project. The project form of education contributes to the formation of general cultural, educational, cognitive, informational, communicative, research competencies, readiness for self-education.

The basis of this technology is a humanistic attitude to the personality of the student. The main distinguishing feature of the humanistic approach is attention to the individuality of a person, his personality, a clear orientation towards the conscious development of independent critical thinking. Personally-oriented technologies include "collaboration pedagogy".

Student-centered learning involves the use of various forms and methods of organizing learning activities. Collaborative learning involves the organization of groups of students working together to solve a problem or study a topic. This technology is focused on the fact that the child learned to learn.

After the presentation of each group, the speakers briefly highlight the most important, answer questions. We wrote down a few sentences in a notebook. Of course, there are guys in the class who are lazy, do not want to study, but the participation of all the guys in the group in the speech at the lesson was a prerequisite. During the performance of the group members, the rest in special criteria sheets evaluated them. Thus, we worked together on the topic of the lesson.

It is necessary to highlight the positive aspects and difficulties that the use of this technology gives.
The positives are the following:

- when preparing a speech, conditions are created for the active cognitive activity of students, this gives a better result than the passive acquisition of knowledge in finished form;
- the skills of cooperation with peers and an adult (teacher) in educational research activities are formed;
- the readiness and ability for independent information and cognitive activity develops (the ability to search, analyze, plan and select information, master the skill of working with various sources of information);
- during the performance, the guys develop oral speech, learn to ask and answer questions, analyze facts, find the causes of phenomena;
- communication skills develop: the ability to work in a group, to be responsible for the success or failure of the entire group;
- work in such a lesson develops students' confidence in their own abilities, in the possibility of achieving success;
- develops the skill of assessment and self-assessment.

But there are also difficulties:

- ✓ the teacher needs to create in the lesson an atmosphere of interest for each student in the work of the class, to encourage students to express themselves without fear of making a mistake;
- ✓ the teacher is a full participant in the learning process, an assistant to students, and it is

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not easy to cope with this new role (after all, teachers are often dictators);

✓ it is impossible to predict the result in advance, to act according to a worked out plan.

And yet, cooperation, sharing knowledge through joint actions, will give results. After all, it is through them that the process of changing the consciousness of the individual takes place.

The goal of student-centered technology is the student's personal achievements, and they are associated with the level of the student's competence in the educational process. The listed positive results allow the formation of various competencies: educational and cognitive, communicative, informational, health-saving. Test-based assignments are widely used in teaching practice. They are used at various stages of the lesson, when conducting classes of various types, in the course of individual, group and frontal work, in combination with other means and teaching methods. Often we use test tasks when conducting tests in grades 9-11. Today, there are various types of tests. Topic tests are very convenient to conduct after studying the entire topic. As a result of testing, you can see how well, fully, consciously the student mastered the material.

In my opinion, tests created by the teacher himself make it possible to most effectively identify the quality of knowledge, to individualize tasks, taking into account the characteristics of each student. I compose test tasks taking into account the objectives of the lesson, the specifics of the material being studied, cognitive capabilities, and the level of readiness of students. Therefore, I have compiled tests for each group aimed at developing skills and knowledge, at consolidating knowledge.

Test technology helps in monitoring students' knowledge. The test provides a subjective factor when checking the results, and also develops logical thinking and attentiveness in children.

Test tasks differ in the level of complexity and in the form of answer options. The use of test tasks allows for the differentiation and individualization of student learning, taking into account their level of cognitive abilities.

Our task, as a teacher, is to organize learning activities in such a way that the knowledge gained in the lesson by students is the result of their own searches. But these searches must be organized, while managing students, developing their cognitive activity.

Conclusion

Systematic work on the use of modern pedagogical technologies and their elements in the educational process makes it possible to increase the efficiency of the educational process, help to achieve the best result in teaching physics, increase cognitive interest in the subject, leads to the fact that academic performance in the subject is 100% both according to the results of the Exam, students take an active part in subject weeks, participate in Olympiads and etc.

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