



ADVANTAGES OF USING INNOVATIVE TECHNOLOGIES IN TEACHING PHYSICS

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ABSTRACT

Today's modern world encourages to look at every detail in the field of education with a modern eye. Including teaching students of each subject, in addition to its educational methodology, incorporating modern innovative technologies is one of the current issues. In this article, the author describes in detail the importance of physics in the world community and the use of innovative technologies in teaching this science to students.

Currently, in all educational institutions, regardless of the form of education, great attention is paid to improving its quality and efficiency. For this, interactive educational technologies are used in classes, innovative and creative approach of the teacher is required in organizing lessons and presenting new information to students. This requires the teacher to constantly search for the appropriate and effective use of innovative technologies in classes.

It is known that theoretical lessons (lecture training) in educational institutions are one of the main forms of organizing the educational process. Currently, a number of innovative educational technologies such as "Keystady", "SWOT analysis" and "Assessment" are used in theoretical and practical classes in all educational institutions.

Physics helps us understand how the world around us works, not just the world, but all technology. Also, Physics helps us organize the universe. It deals with the basics and helps you see the connections between seemingly disparate phenomena. Physics gives us powerful directions that help us express our creativity, see the world in new ways, and then change it. Physics provides the quantitative and analytical skills needed to analyze data and solve problems in science, engineering and medicine, as well as economics, finance, management, law and public policy.

Many consider physics to be one of the most difficult subjects. It is not for nothing that it is said that there is no difficult science, only difficult explanations. Currently, interactive elements, which are an element of advanced pedagogical technology, are widely used. The use of interactive methods in physics lessons increases efficiency and students' interest in science. Interactive is derived from the English word "inter", which means "between", "between", that is, activity between two teachers and students. Interactive method - activation of knowledge acquisition of students, development of personal qualities by increasing activity between students and the teacher in the educational process. The interactive method in education means



strengthening and activating the relationship between the student and the teacher. These methods help to improve the effectiveness of the lesson through cooperation. They encourage students to think independently. Interactive means learning a given topic through interaction between the teacher and students, improving the effectiveness of the lesson, forming the ability to give independent opinions, feedback, and discussion.

Each student tries to find an answer to the set goal independently, in pairs, in groups, thinks, writes, speaks, tries to clarify the issue through evidence and reasons. This will be kept in the memory of the participants for a long time. He can take a critical and analytical approach to learning new information. The teacher acts only as a facilitator (guide, organizer, observer). There are a lot of interactive methods, now below are examples of how the charxpalak technology is implemented and how to use it in physics. «Charxpalak» technology Description of the technology. This technology can teach students to remember the topics covered, to think logically, to independently answer the questions correctly and to self-evaluate, and in a short time, the teacher will review the acquired knowledge of all students. aimed at evaluation. The purpose of the technology: to teach students to think logically during the lesson, to express their thoughts independently, to evaluate themselves, to work individually and in groups, to respect the opinions of others, to choose the right one from many opinions. The use of technology: in all types of technology training sessions, at the beginning of the lesson or at the end of the lesson, or at the end of any section of the educational subject, to evaluate the level of mastery of the topics by students, repetition, reinforcement or intermediate and intended for final control. This technology can be organized in the training process or in a part of it in the form of individual, small group and team.

Physics is the basis of most modern technology and the basis for the instruments and devices used in scientific, engineering and medical research and development. Physics-based technologies prevail in production. Schools without qualified physics teachers cut off their students from the respectable and well-paying careers they can pursue in the future. Students majoring in physics do better on the SAT, MCAT, and GRE. Physics majors do better on the MCAT than bio or chemistry majors. Because physical processes, electronic textbooks, animations, virtual laboratories and experiments are being shown to students during the lesson in the teaching of science using these electronic tools in educational institutions.

In particular, in the Academy of the Ministry of Emergency Situations, in the educational process of all subjects, lectures, laboratories and practical training, new modern technologies and equipment are used, i.e., digital measuring devices, virtual laboratories, animations, electronic textbooks, and based on them the use of multimedia tools is widespread, and in addition to this, the importance of various scientific-practical, spiritual-educational conferences held in the school is also increasing in the effective organization of websites, in increasing the effectiveness of education.

A major in physics provides excellent preparation for graduate studies in all engineering and information/informatics sciences, not just physics; life sciences, including molecular biology, genetics, and neurobiology; earth, atmosphere; economics and finance; and is a leading field in public policy and journalism. You can't be an engineer or a doctor without physics; less likely to engage in teaching; your video games will be boring and your animated movies won't look real; Your global warming policy decisions won't matter much. Although the number of



job postings specifically for physicists is smaller than for engineers, for example, the job market for those with physics qualifications is diverse and always strong. Because physics fosters quantitative, analytical thinking, physicists are more likely than other technical professionals to be in senior management and policy positions. Two of the top three science-related positions in the US government—the Secretary of Energy and the director of the White House Office of Science and Technology Policy—are currently held by physicists. All of us, including professional physicists, find high school physics courses challenging because they require us to learn many of the concepts and skills that make physics education valuable in many professions. requires mastery. This means that physics is much harder to study after college (independently or on the job) than other subjects like history or psychology or computer programming.

One of the urgent problems facing the physics teacher today is the design of modern educational technologies and their application in teaching practice. A physics teacher should not only provide students with the necessary knowledge of physics, but should be able to arouse interest in science in them, so that as a result, good specialists and mature personnel in this field will be produced.

New pedagogical technologies for the lesson:

- using the media;
- using visual aids;
- by using interactive methods; and others, this lesson will reach the student's mind and take a place in his memory.

The student's scientific worldview expands and the level of knowledge increases. The goal of organizing modern education, different from traditional education, is to achieve high results in a short time without spending too much mental and physical effort. To deliver specific theoretical knowledge to students in a short period of time, to create skills and competencies in them in relation to certain activities, as well as to control the activities and knowledge of students, to evaluate their knowledge, skills and competencies from the teacher of physics requires great pedagogical skills and a new approach to the educational process. Currently, many developed countries of the world have accumulated a lot of experience in using new pedagogical technologies that increase the scientific activity and creativity of students and at the same time guarantee the effectiveness of the educational process. The methods that form the basis of this experience are called interactive methods, and knowing how to apply these methods to the teaching process is a high task assigned to the physics teacher of today. The successful design of pedagogical technology and the guarantee of the final result (effect) depend on the level of the teacher's understanding of the essence of didactic issues and his ability to correctly assess them in the lesson. Determining the specific purpose of education in each lesson is considered one of the important conditions in the design of teaching technology. In this, the diagnostic purpose of teaching on science topics is determined. Since the time when physics became a science, the database of the science has been increasing in size, and it is getting rich every year at a high speed. For this reason, in the process of passing physics, it is necessary to select only the necessary information and to reduce the amount of information to a quantitative size in accordance with the student's learning abilities. In the educational system, multimedia electronic educational literature, lectures, virtual laboratory work, various



animation programs are special programs that are needed for creating slides. In the educational system, the above-mentioned programs have ready-made models, in which the user can widely use several series of works (laboratory, analysis of fire safety issues, animations in presentation lectures) by entering the initial parameters. Examples of programs that enable modeling of physical processes include: MatCad, MatLab, Maple, Crocodile, Physics, Electronics Workbench and other software packages.

Physical knowledge is widely used in information technology for computer modeling of physical processes. Also, the unique important aspects of modeling are that it is not necessary to prepare various tools, to describe the phenomena in a vivid and natural way, to repeat the experiment at any time in a short time, to observe the processes that are difficult to observe and cannot be observed at all. will also have the opportunity to demonstrate. Computer-assisted training is more effective than regular training. Conducting animated exercises using computer programs in teaching physics makes the teacher and the listener comfortable and has a good effect in understanding the mechanisms and stages of physical processes. The mechanisms of physical processes, their demonstration in lectures, practical and especially experimental classes, and conducting these cases based on computer technologies are factors that increase the efficiency of imparting knowledge to students and creating skills related to the basics of science during the teaching process.

The use of modern innovative technologies in the process of teaching physics leads to students' understanding, arouses interest in learning the subject, and improves students' creative abilities. Computer materials are a necessary part of the only educational tools that can supplement, refresh, and become a lifestyle for the teacher. The advantages of integrating innovative technologies compared to traditional education are diverse. To them, in addition to the effective testing of knowledge, it can be related to the variety of methodological forms, from production and logical thinking and testing others. Integrating computer technology into the learning process, you can provide:

- Constructive, algorithmic thinking due to the specific features of communication with a computer and the specific features of working with specialized programs;
- Development of creative thinking by changing the content of reproductive activities that perform tasks between intelligent educational systems and modeling programs;
- Creating communicative skills based on the implementation of joint projects in the process of computer business games;

Today, education is undergoing modernization processes. One of the main principles of the state policy in the field of education is "accessibility to the public, flexibility of the educational system to the educational system, characteristics of educating and training students." In conclusion, it can be said that as a result of using the above mentioned programs in the lecture process, it is possible to demonstrate the necessary information to the listeners and students in a short time. This is an important factor in improving educational efficiency.

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