

EFFICIENCY OF ICT APPLICATION IN THE LEARNING PROCESS

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Annotation

This article examines the role of information and communication technologies in the modern educational process. The use of information technology makes it possible to individualize the educational process by providing opportunities for students to both study the subject in depth and practice elementary skills and abilities. In this article, the author presents to your attention the importance and significance of the use of computer technology in physics lessons.

Keywords: physics, information and communication technology, concept, competence, physical process.

Introduction

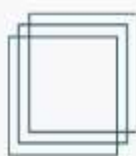
As emphasized in the concept of development of the higher education system of the Republic of Uzbekistan until 2030, the main result of the activity of an educational institution should be the personality of the student. Graduates of higher educational institutions must be professionally competent in assessing the processes taking place in society, possess deep scientific knowledge, be capable of continuous self-development and self-improvement. In this regard, there is a need to master modern teaching technologies, such as interactive, information and communication.

The 21st century is called the century of information civilization, and every individual of an informed society, especially a physics teacher, must develop information and communication competence, which means that students must be taught how to receive information from various sources, including electronic ones.

The use of information technology makes it possible to individualize the educational process by providing opportunities for students to both study the subject in depth and practice elementary skills and abilities. The computer allows each student to work independently, consciously and develops creative skills. This approach not only increases consciousness and confidence, it also increases the student's self-esteem.

The use of a computer reduces the time of assimilation of information, since the search for the desired material, the ability to sort by key words and its analysis can be carried out simultaneously.

Computer simulation of some physical processes and phenomena (for example, the free fall of bodies, the behavior of a gas with changes in pressure, temperature, etc.) helps to better understand the physical essence of the phenomenon, i.e. through



modeling, you can visually illustrate a particular phenomenon or the implementation of the laws of physics.

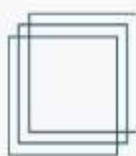
The real goal of informatization of education is to change the content, methods and organizational forms of the educational process in the context of the formation of a “new” educational system, which is designed to solve the problem of preparing young people for life in a rapidly changing information society. As the analysis of the existing situation shows, life not only makes new demands on the education system, but also provides it with some tools for solving new problems. Chief among these are new pedagogical technologies and the ICTs that support them.

On March 19, 2020, the President adopted a resolution “On measures to improve the quality of education and improve scientific research in the field of physics” [1].

The Resolution approved the Program of Comprehensive Measures to Improve the Quality of Education in Physics and Ensure the Effectiveness of Scientific Research in Physics in 2021–2023 (Comprehensive Program). One of the main tasks of the Comprehensive Program is; widespread introduction of modern teaching methods into the educational process, including information and communication technologies. Authors G.A. Bordovsky, V.A. Izvozhikov, V.V. Laptev, I. G. Zakharova, N.S. Purysheva, V.E. Fradkin and others in their works analyzed the issues of didactics and methods of using information and communication technologies in the process of teaching physics. All authors agree that "the psychological and pedagogical foundations of the use of ICT in teaching are the concepts of developmental learning, the activity approach and the technology of research activity" [2-7].

At the same time, ICT can be successfully used at all stages of an educational lesson: they have a significant impact on the control and evaluation functions of the lesson, give it both a playful character and research functions, and contribute to the activation of conscious activity. The use of ICT makes it possible to achieve a qualitatively higher level of visibility of the proposed material, significantly expand the possibilities of including various exercises in the learning process, activate all types of memory (which is important, since not everyone perceives information simultaneously with visual and auditory images, 80% of information is perceived through sight), and continuous feedback enlivens the learning process, contributing to an increase in its dynamism, which ultimately leads to the formation of a positive attitude of students to the material being studied, interest in it, and an increase in the quality of education. Here are some of the benefits of using ICT:

1. Provides an explanation of a new topic in a different format, i. E. selection to the topic of text, graphic, video, audio materials in the form of a presentation and multimedia illustrations, as well as information materials from various sources can be integrated and varied depending on the purpose of the lesson;
2. Facilitates the control of the assimilation of the material, that is, it can be carried out both during the lesson and in specialized classrooms in the form of test work;



3. Conduct independent activities, i.e. carry out independent work, organize and carry out design or research work;
4. Perform laboratory work in virtual mode, simulate physical processes and phenomena using multimedia performances.

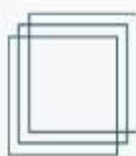
If the development of physics helps the development of technology, then technology, in turn, enriches physics with new, more advanced instruments and methods for studying nature, and sets new challenges for physics.

As you know, some phenomena cannot be demonstrated in a physical office. For example, these are phenomena of the microworld, or fast-flowing processes, or experiments with devices that are absent in the office. It is in such cases that the use of ICT technologies can not only create a model of such phenomena, but also allow illustrating the course of the process, with the possibility of determining the optimal conditions. For example, when considering the topic "Fundamentals of Molecular Kinetic Theory", you can use the model of diffusion of gas molecules using animation. This model allows you to see the diffusion process in dynamics, which cannot be reproduced using laboratory equipment. When studying the topic "Brownian motion", you can use the materials of the site "Animation in Physics", where the trajectory of a particle is shown in an animated form. Due to visual presentation, i.e. a high degree of visibility, an increase in the efficiency of the educational process is observed.

When studying the topic "Isoprocesses", the isothermal process can be demonstrated using a model from the *disc "Multimedia Physics Course" Open Physics. Part 1* ", where, due to virtuality, modeling can be carried out many times. An isothermal process in a gas is simulated, i.e. the process of quasi-static expansion or contraction of an ideal gas in contact with a thermal reservoir ($T = \text{const}$).

The tank temperature is selectable. A plot of dependence (PV) for an isothermal process is presented, an energy diagram is displayed, which indicates the amount of heat Q received by the gas, the work A produced by the gas and the change ΔU of its internal energy. The use of such a model makes it possible to analyze the relationship between the values of Q , A , ΔU , to clearly demonstrate the graphical dependence, to view the process with an optimal speed for assimilation, changing the initial parameters.

To establish the efficiency of using ICT in the learning process, an analysis of the lesson on the topic "statistical and thermodynamic description of entropy" with different forms of its organization was carried out, i.e. traditional and using interactive electronic applications. The analysis of effectiveness was determined by testing students according to the following methodology: firstly, a questionnaire was conducted on the terms of the given topic; second, the ability to provide examples for describing entropy from a statistical and thermodynamic point of view was analyzed. With the traditional form of organizing the lesson, the assimilation of the presented material was about 75%, and with the use of ICT it reached 92%. According to the test



results, it was found that the use of ICT increases the efficiency of classes by 17%. It can also be stated that the use of ICT forms students' information culture and information competencies.

Conclusion

The use of ICT in the classroom is more effective than traditional ones, since it increases independence in studying the course, develops attentiveness, logic and imagery, and activates interest and responsibility.

The use of ICT makes it possible to achieve a qualitatively higher level of clarity of the proposed material, significantly expand the possibilities of including various exercises in the learning process, and activate all types of memory. Classes using ICT create a certain emotional environment that contributes to increased independence, responsibility, develops research activities, and is the key to high-quality assimilation of knowledge.

Thus, the use of ICT in the classroom of a physics course leads to the following positive results: research activity is activated, creative skills, independence, the ability to analyze, compare, generalize, increases the student's self-esteem, thereby expanding the scientific outlook of students, which leads to an increase in the quality of education.

Literature

1. Resolution of the President of the Republic of Uzbekistan No. PP-5032 of 03.19.2021 "On measures to improve the quality of education and improve scientific research in the field of physics"
2. Information technologies in the system of continuous pedagogical education: (Problems of methodology and theory): Monograph / [E. V. Baranova, G. A. Bordovskiy, T. A. Boronenko and others]; Ed. V. A. Izvozchikova; Grew up. state ped. un-t them. A. I. Herzen. - SPb. : Education, 1996.-- 222 p.
3. V.A. Izvozchikov, Infonospheric education. New information technologies of teaching: Textbook. allowance / V. A. Izvozchikov. - SPb. : RGPU, 1991.-- 120 p.
4. Laptev V.V., Noskova T.N. Professional training in the electronic network environment // Higher education in Russia. - 2013. - No. 2. - S. 79-83.
5. I.G. Zakharova. Information technology in education: a textbook for students. higher. ped. educational institutions. - M. : Publishing center "Academy", 2003.
6. N.S. Purysheva, Z.M. Abduragimov. Formation of information and communication competence of the future teacher in teaching general physics. Bulletin of the Chechen State Pedagogical Institute. 2009, no. 1, p. 72-76.
7. ICT in the subject area. Part V. Physics: Methodical Recommendations / Ed. V.E. Fradkin. - SPb, GOU DPO TsPKS SPB "Regional center for assessing the quality of education and information technology", 2010. - 83 p.