

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TEACHING PHYSICS IN PEDAGOGICAL UNIVERSITIES

Yulduz Xayrulloqizi Xudoyberdiyeva

Department of Physics, Chirchik State Pedagogical University

Abstract

The article talks about the use of information communication technologies in teaching physics. It is necessary to use information technologies to increase the effectiveness of the lesson. In order to improve the quality of education, it is suggested to hold classes using information and communication tools.

Keywords: Information technology, Physics, educational quality, educational efficiency, educational methods.

Currently, the issue of effective use of information and communication technologies (ICT) in educational processes in educational institutions, in particular, in teaching physics, remains relevant.

Modern computer programs and telecommunication technologies provide students with access to information sources such as electronic textbooks, educational sites, etc. It is aimed at increasing the effectiveness of the development of cognitive independence and creating new opportunities for the creative growth of students. Internet resources, e-textbooks, educational programs together with traditional methods help to successfully achieve the goal - who knows how to apply theoretical knowledge in practice, is able to learn independently, self-development and self-improvement forming a ready thinking person.

The purpose of the study is to develop guidelines for the introduction of ICT technologies for physics education in secondary schools. - to justify and determine the effectiveness of the possibilities of using modern information and communication technologies in teaching physics at school.

Study object: ICT - technological development of the educational process in a modern school.

Research topic: The content of the physics teacher's activity in the upper classes of secondary schools on the introduction of ICT technologies

Research hypothesis:

- if you use information and communication technologies in the process of teaching physics in high school, then - students' interest in science increases, which helps to improve the quality of teaching physics;
- The interest of teachers to use information and communication technologies in physics lessons increases.

To achieve the research goal, we develop the following tasks:

Analysis of the state of problems of using information and communication technologies in the educational process and in the process of teaching physics in general.

- Development of recommendations on the use of information and communication technologies in teaching physics.

To offer effective directions to the teacher in the use of ICT technologies in teaching physics. Researches on the theory, methodology and practice of teaching physics became the methodological basis

The following research methods are used to solve tasks:

- theoretical analysis of the problem based on the study of psychological, pedagogical, methodical literature in physics and literature on the use of information and communication technologies in schools;
- to study the structure of the educational programs in physics, textbooks, didactics, electronic educational resources in physics;
- study of advanced pedagogical experience in the use of information and communication technologies at school; - conducting pedagogical measurements (observations, interviews, questionnaires, interviews with teachers and students, conducting experimental surveys).

Today, most students understand the importance of studying physics.

However, there is a problem with certain students having little or no interest in learning physics. We believe that students lack motivation and motivation. An important step in the effective educational process for learning physics is physical experience that encourages active cognitive activity and a creative approach to learning. With traditional forms of the educational process, such an opportunity is realized during the necessary laboratory work or practical training.

The creation of educational programs, educational and methodological materials, as well as new types of textbooks and instructional manuals, focused on the active use of computer technologies, is of particular importance for teaching physics, because it is here that the computer organizes the educational process. it opens up new opportunities both in doing and in scientific research. special events in cases where traditional methods are ineffective. This allows us to consider computer teaching as one of the most important modern trends in physics teaching methodology.

In this case, it is very useful for students to work with computer models, because computer modeling allows you to create a vivid, memorable dynamic picture of physical experiences or events on the computer screen.

The somewhat conditional nature of the presentation of the results of computer modeling can be compensated by the presentation of videos of field experiments, which have a sufficient idea of the true course of physical phenomena.

Some lesson models allow to construct the time dependence of a number of physical quantities describing the experiment in a dynamic mode simultaneously with the experiment.

Here are two examples of such activities tested in practice:

1. The lesson is research. Students are encouraged to conduct independent research using a computer model and obtain the desired results. In addition, many models allow such a study to be conducted literally in a few minutes. In this case, the lesson is carried out in an ideal way, because students get knowledge in the process of independent creative work, because they need to have knowledge to get a certain result that can be seen on the computer screen. In this case, the teacher is only an assistant in the creative process of acquiring knowledge. Of course, such a lesson can only be taught in a computer laboratory.

2. Next computer review troubleshooting lesson. The teacher offers students to solve tasks in the classroom or at home, they can check the correctness of the solution by setting up computer

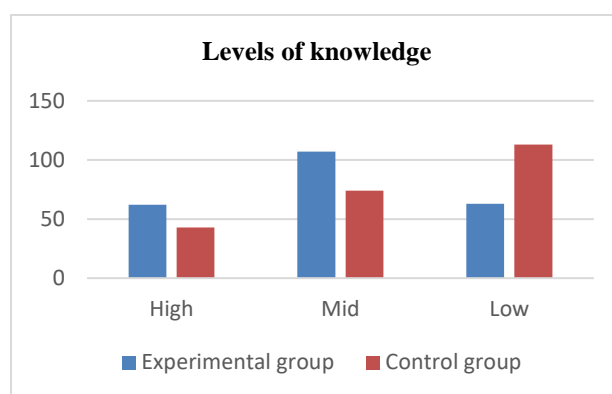
experiments. The possibility of independent further verification of results in computer experiments increases cognitive interest, encourages students to work creatively, and often brings it closer to scientific research in nature.

As a result, many students begin to consider their problems, solve them, and then check the correctness of their ideas using computer models. The teacher can consciously involve students in such activities, because he is forced to solve the "collection" of problems invented by students, which usually does not require time.

In fact, to check the correctness of the answer, it is enough to conduct an experiment on the computer, which usually takes less than a minute, moreover, such experiments are carried out by the students themselves.

The study reflects the goals and organization of the pedagogical experiment, before and after the application of ICT in the educational process by diagnosing the knowledge, skills and abilities of students.

Dynamics of formation of students' knowledge and skills at the beginning and end of the experiment



Research has confirmed the truth of the scientific hypothesis about the need to use ICT in physics classes.

Thus, we can distinguish the following aspects of realizing the educational potential of ICT in a modern lesson.

Related to educational activities:

- increase the enthusiasm of the educational process;
- student activation in the lesson

About the organization of the educational process:

Differentiation and individualization of education;

- additional opportunities to create problematic situations;

Systematization of educational search process;

Quick check of student assumptions;

Rapid diagnosis of the effectiveness of the educational process;

Transition from qualitative to quantitative research.

On its role in student development

additional features of appearance; expanding the scope of research;

- measurement and visualization of fast processes;

- detailed study of "delicate" moments of experience;

In this work, the problems of analyzing the use of information and communication technologies in the educational process in general, and in the physics teaching process in particular, were solved.

It consists in determining the main directions of the teacher's activity in the use of ICT technologies in teaching physics.

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