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POSSIBILITIES OF USING MULTIMEDIA SOFTWARE IN TEACHING PHYSICS

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Annotation: This article discusses the possibilities, effectiveness, and impact of using software tools in physics lessons on the educational process. In particular, it analyzes the advantages and possibilities of using software tools in teaching physics.
Key words: Software educational tools, simulations, virtual lab stands, electronic textbooks, multimedia tools, training simulators, 3D animations.

Today, the introduction of modern forms and didactic tools of teaching in the world education sector, the design of the educational process based on modern educational tools, the use of software educational tools in the information education environment are considered to be urgent issues. The formation of a global educational environment typical of Europe and other developed countries, ensuring the continuity and practical orientation of education, ensuring the integration of science, education and production, developing the creative abilities of students, and improving the mechanisms for using modern software educational tools in the development of education are becoming increasingly important.

Information and communication and innovative technologies enrich the content of education and serve to update the forms, methods and means of teaching. The introduction of innovations into the educational process is inextricably linked with the development of computer technology, and the use of multimedia software tools in the educational process with the help of information and communication technologies is the simplest and most qualitative method for increasing student motivation, forming and assessing their subject-related competencies.

The use of multimedia educational tools in the educational process, namely electronic textbooks, electronic problem sets, electronic educational and methodological complexes, virtual laboratory stands, multimedia tools, 3D animations, electronic training simulators and computer systems for knowledge control, significantly increases the motivation of learners and the effectiveness of the quality of education [3].

Practice shows that teaching students based on multimedia educational tools is twice as effective and saves time. Up to 30% of time can be saved when learning based on multimedia educational tools, and the acquired knowledge is stored in memory for a long time. If students perceive the materials presented visually, the retention of information in memory increases by 25-30%. In addition, if educational materials are presented in the

form of audio, video and graphics, the retention of materials in memory increases by 75% [4].

Software educational tools are didactic tools designed to partially or completely automate the educational process using computer technologies. They are considered one of the promising forms of increasing the efficiency of the educational process and are used as teaching tools of modern technologies. Pedagogical software tools are created using programs that implement effects such as dynamic illustrations, sound processes, animations.

Software educational tools are divided into the following types: training programs, test programs, exercisers, programs that form a virtual learning environment with the participation of a teacher.

In the education system, software tools are divided into two types: those related to the organization and management of education are called programmed tools, and those related only to the educational process are called software educational tools.

Today, many programmed educational tools have been created for use in the educational process, including electronic textbooks, electronic study guides, electronic journals, electronic encyclopedias, electronic libraries, virtual libraries, electronic catalogs, electronic educational methodological complexes and other terms. Software educational tools are publications made at a high scientific, methodological and technical level, located on magnetic optical media or computer networks (local, regional, global) and containing an electronic representation of educational information.

Multimedia technology can simultaneously transmit information in a combination of many forms (including speech, pictures, drawings, images, music, numbers and letters) that are understandable to a person. This technology can search, copy and transfer information to another computer in the form shown, and create any combination of them. In addition, multimedia technology allows the user to engage in design himself, as well as create static (still) and dynamic (moving) images and distribute the results of his creative work to the external environment through communication channels.

The use of multimedia software in lessons provides teachers with a number of conveniences. Because thematic audio programs, visual developments, moving recordings (presentations), films created in the form of animation, animations will be an interesting novelty for the student, attract the student's attention and increase the effectiveness of education.

For example, in teaching the physics topic "Semiconductors. Mixed conductivity in semiconductors", the use of virtual laboratory stands, electronic textbooks, and animations reflecting their structure and operating principles in determining the "Volt-Ampere" characteristics of semiconductor devices, along with theoretical information, ensures that students gain in-depth knowledge of the topic.

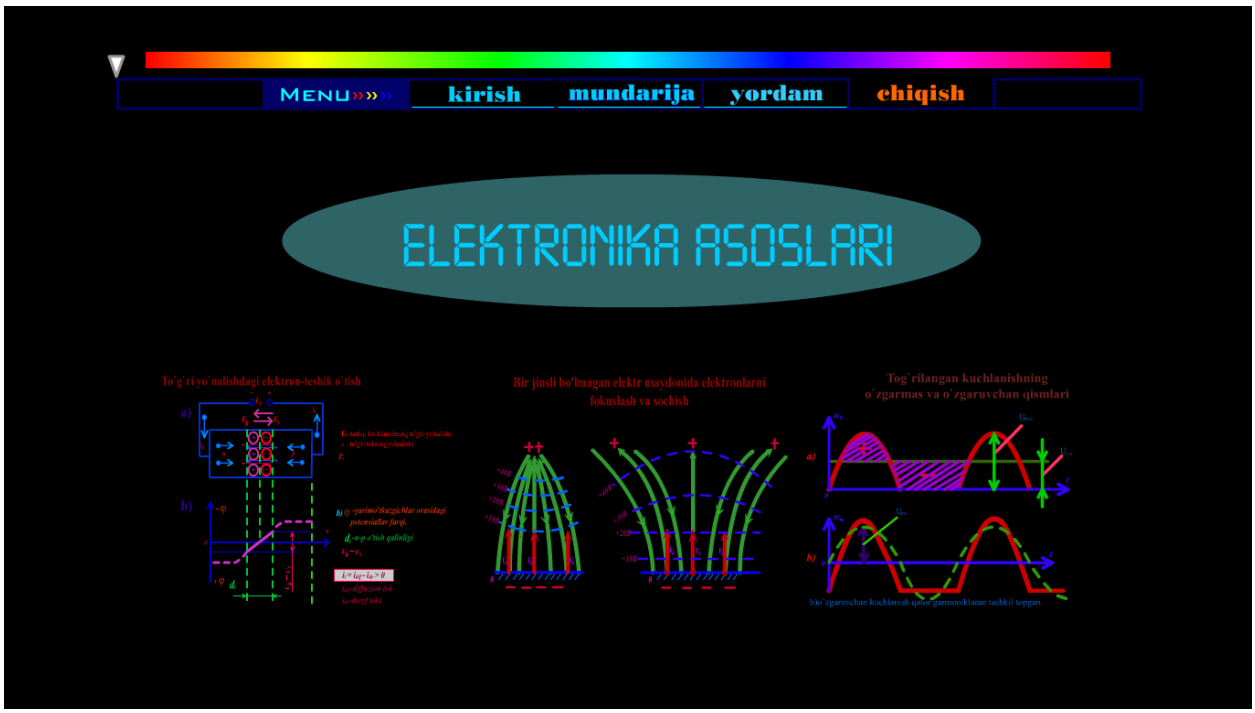

Figure 1. Electronic document main window view.

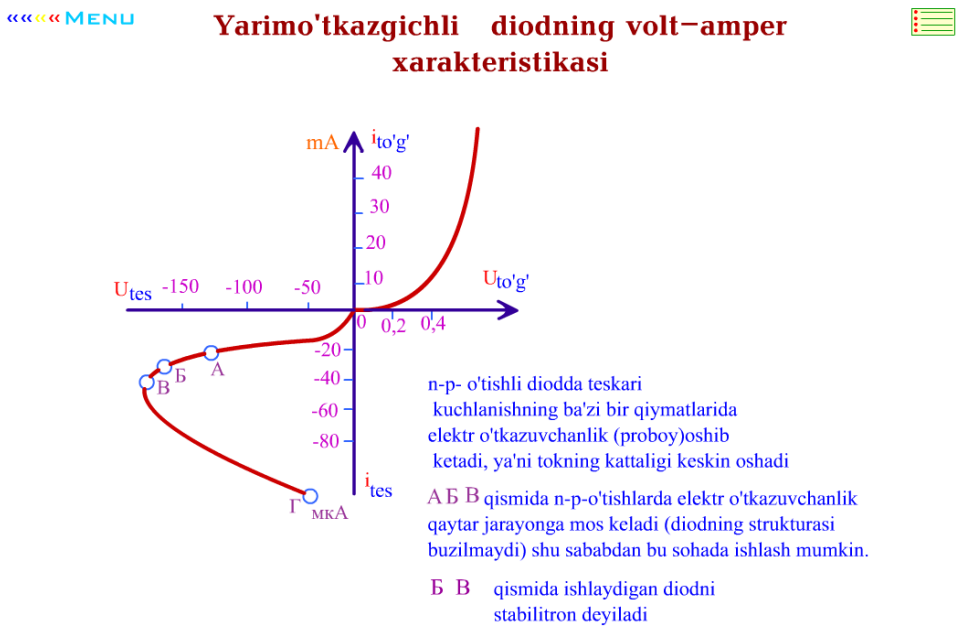

Figure 2. Illustration of the volt-ampere characteristic of a semiconductor diode in an electronic circuit.

The use of virtual stands and laboratories in the educational process is a natural stage in the development of the educational system, which is no exaggeration to say that it will replace the blackboard with computer-based educational animation and multimedia programs, from conventional information resource centers to electronic information

resource centers, from small learning groups to virtual classrooms of any size. In recent years, a new term has been formed in the field of information and communication technologies in education - the concept of a virtual educational laboratory. It corresponds to the principles of open and distance learning and allows, at least partially, to solve problems related to the material and technical support of the educational process.

Physics is a science that studies the laws of nature and often includes abstract concepts. Therefore, tools that describe or demonstrate real-life processes in physics provide students with the opportunity to better understand them.

Through simulations, for example, students have the opportunity to observe physical phenomena in real time and create their own experiments. This helps to study especially dangerous or complex experiments in a safe environment.

Advantages of software learning tools:

Interactivity: Students become active and directly participate in the learning process. This method is more effective than passive listening.

Visualization: Depiction of physical phenomena using graphics and animations helps to more easily master complex concepts.

Adaptability: Teachers can use a variety of software to adapt the lesson to the needs of students.

Visualization: Software learning tools allow students to immediately see the results through experiments and practical exercises, which deepens their understanding [4].

In particular, if we look at the use of software learning tools in 11th grade physics lessons in general secondary schools:

Mechanics: Simulations can explain the laws of force, acceleration, and motion. For example, interactively demonstrating Newton's laws is very understandable to students.

Electromagnetism: By visualizing the effects of electric and magnetic fields, students better understand the motion of charges and their interactions.

Optics: Explaining the refraction, reflection, and interference of light using software presents complex processes in a simple way.

Multimedia software tools are an innovative approach to teaching physics, which serve to consolidate students' knowledge of the subject, increase interest, and develop practical skills. With the help of software tools and simulations, it becomes easier to explain complex physical processes, and the quality of education increases significantly. In the future, it would be appropriate to further improve these tools and widely introduce them into the education system.

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