THE ROLE OF INNOVATIVE PEDAGOGICAL SOFTWARE TOOLS IN IMPROVING THE EFFECTIVENESS OF TRADITIONAL EDUCATION

Akhmedova Nodira
Tashkent University of Information Technologies named after Muhammad al-Khorazmi, associate professor

Annotation. In this work, the advantages and achievements of using modern software tools, in particular the "FASTMEAN" program, which are important in teaching physics for personnel in the field of information technology, are discussed. Special software tools for organizing lessons using modern information technologies, computer modeling of physical and mathematical processes, and the basics of creating an imitation computer model of a real physical process are explained in educational processes. Unique important aspects of modeling, various physical devices and tools modeling conditions, vivid and natural depiction of events, ability to demonstrate processes that are difficult to observe.

Key words: Information - communication technologies, fastmean, educational process, pedagogical software, physical processes, modeling.

The use of information and communication technologies in the educational process is one of the most urgent problems of the present time, because in each field it is necessary to use different methods for learning, research and gaining experience. Therefore, it is appropriate to use new information and communication technologies in learning from kindergarten to higher level [1-2].

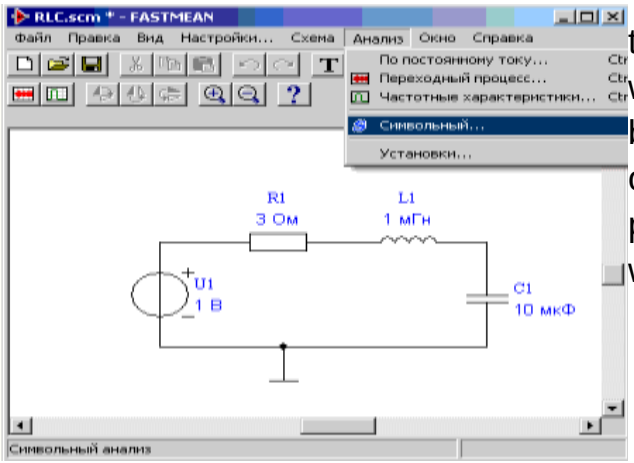
Educational processes must have special software for organizing lessons using modern information technologies. Today, the organization of education by using modern information technologies, which differs from the traditional form of education, provides an opportunity to achieve high efficiency. In terms of teaching physics, it is important to develop effective methods of forming the imagination of the theoretical model in the minds of students, introducing them to phenomena and processes [3-5].

Information technology knowledge is widely used for computer modeling of physical and mathematical processes [6]. In the educational system, there are special programs needed to create multimedia electronic educational literature, lectures, virtual laboratory work, various animation programs, and more. Examples of programs that provide modeling of physical processes include: Origin, MathCad, MatLab, Maple, Crocodile Physics, Electronics, Workbench, Interactive Physics and

other software packages. At the same time, there is also a ready-made open-source Phet pedagogical software. The Phet educational software package was developed by scientists at the University of Colorado and is widely distributed as open source [7].

FASTMEAN is an electrical circuit modeling program that allows you to calculate transients, signal spectra, and frequency characteristics for circuits containing linear and non-linear elements. Along with theoretical and experimental studies, schematic modeling is widely used in the development of modern electrical engineering and electronic devices [8-10]. In the teaching of physics to students studying in the field of information technologies, schematic modeling is an important part of the educational process. The FASTMEAN program uses new algorithms to solve equations for electric circuits [11-12].

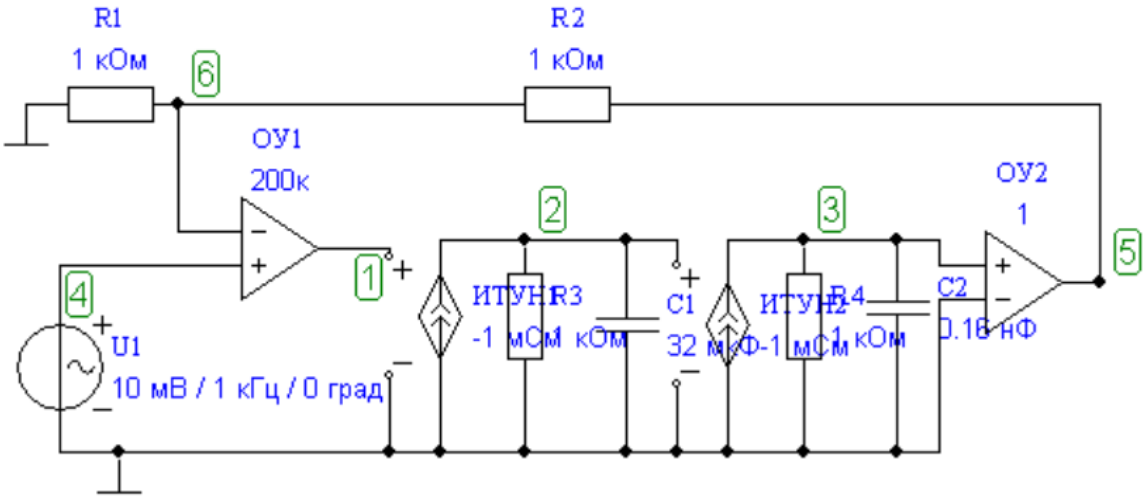
All elements are divided into groups. Each group has a corresponding button on the toolbar (Figure 1).



Click the appropriate button to display any group items. A window with items will appear below it. Move the mouse pointer over the chart where you want to place the element and click once with the left mouse button.

Figure 1

To add the same element to another location on the diagram, move the mouse to that location and left-click again. This can be done several times. Right-click to finish adding the item.



Schematic creation algorithm using FASTMEAN software

The most important of FASTMEAN's internal capabilities is its ability to analyze the time domain. When analyzing nonlinear impulse systems, FASTMEAN's computational speed is many times faster than the best specialized programs. At the same time, accuracy is always high.

With the help of these pedagogical software, students can pause and rewind physical processes at any time and feel like a participant in the process by changing the initial parameters. The study of a physical process is necessarily carried out on the basis of a certain model, that is, an abstracted, simplified image of this process. A certain model is used as a basis for creating an imitation computer model of a real physical process.

Also, the unique important aspects of modeling are that it is not necessary to prepare various physical devices and instruments, the phenomena can be depicted in a vivid and natural way, the experiment can be repeated any time in a short time, it is difficult to observe or cannot be observed at all. Ability to demonstrate processes. These pedagogical software tools allow the teacher to demonstrate many physical effects on a computer monitor and with the help of a multimedia projector, as well as to improve a new non-traditional type of teaching. Today, the use of information technologies makes it possible to animate physical mechanisms of invisible, fast or slow processes, complex events.

Conclusion. Therefore, we can increase the quality and efficiency of education by applying modern technologies to the educational process. Based on the fundamental physical theories, the materials of the physics course are presented in a correct and unified system. This leads to the conclusion that scientific knowledge

based on the ideas of all scientific directions in the world of science is the basis for forming the scientific outlook of students.

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