



USE OF MODERN INFORMATION TECHNOLOGIES IN TEACHING PHYSICS

Fayzieva Kholida Asadovna

Teacher of the Department of Physics,
Faculty of Physics and Mathematics,
Bukhara State University.

fayzievkholid7@gmail.com, tel:(90) 718-34-02.

Article history:	Abstract:
Received: 1 st January 2023 Accepted: 1 st February 2023 Published: 6 th March 2023	Today's modern world encourages to look at every detail in the field of education with a modern eye. Including, teaching each subject to students in such a way as to incorporate modern innovative technologies in addition to its educational methodology is one of the current issues. This article describes the importance of physics in the world community and the use of modern information technologies in teaching this science to students..
Keywords: Computer technologies, virtual laboratory, multimedia tools, Physics at school, Crocodile, Physics, Electronics Workbench, visualization, modern information technologies, animation.	

Currently, in connection with the development of computer technologies, new forms of organizing lessons are being formed. Among them, one of the widely used practical works is the visual explanation of physical processes that are difficult to observe on a computer with the help of special programs by means of electronic textbooks, animations, virtual experiments and presentations. There are many electronic tools related to physics courses designed in this way, and they are mainly used for schools, academic high schools and colleges. Because these electronic tools are used to show physical processes, electronic textbooks, animations, virtual labs and experiments to the students of the course during the teaching of physics in the general high school in the training institutes. These virtual laboratory works have the purpose of the work, the necessary tools and equipment, the procedure for performing the work, control questions, like the usual laboratory works. It is known that the application of computer technologies and the use of multimedia tools based on them in the process of teaching a physics course is of great importance from the pedagogical and psychological point of view, and leads to the following important results:

- The educational process becomes more active, the effectiveness of the lesson increases;
- The transmission of educational materials in various forms (with the help of voice, text, video, graphics, animation) attracts the attention of students;
- A high level of visibility arouses a great interest in the studied subject in the student and listener;
- Ensures long-term retention of learned educational material;

- Opportunities for independent education of listeners and students will increase and the problem of time shortage will decrease.

2500 years ago, the Chinese philosopher Confucius said, "I forget what I hear, I remember what I see, and I understand if I do it independently." Because, when using informational and pedagogical technologies in education, listeners and students will have opportunities for independent thinking based on what they hear, see, and see. There must be certain conditions and technical means for organizing classes using modern information technologies in the educational process.

First, to information resources:

- Personal computer;
- Projector;
- Multimedia tools;
- Scanner (for transferring complex schemes and drawings, images to a computer);
- Video camera (for conducting video conferences and for other purposes);
- Printer, photocopier (printing and duplicating handouts, and for other purposes) and other resources.

The second is special software.

In the educational system, multimedia electronic educational literature, lectures, virtual laboratory work, various animation programs, and special programs needed for creating electronic versions and slides are considered.

"Open physics" from multimedia technologies in the educational process is a multimedia physics course designed for students of general secondary education, which includes the following sections. "Mechanics", "Mechanical Vibrations and Waves", "Optics",



"Interesting Physics", etc. This program contains about a thousand questions related to all sections of the school physics course. "Physics tutor" allows to prepare students for higher educational institutions in physics in an interactive way using a rapid method. The software tool "Physics at school" contains 270 questions related to all sections of the school physics

course. According to the 7th grade physics curriculum of the school course, it is necessary to teach the subject "Motion in a circle". In order for students to understand the topic more simply, the physics of circular motion is explained in section 1, point 7 of the software tool "Physics at school" and can be used.

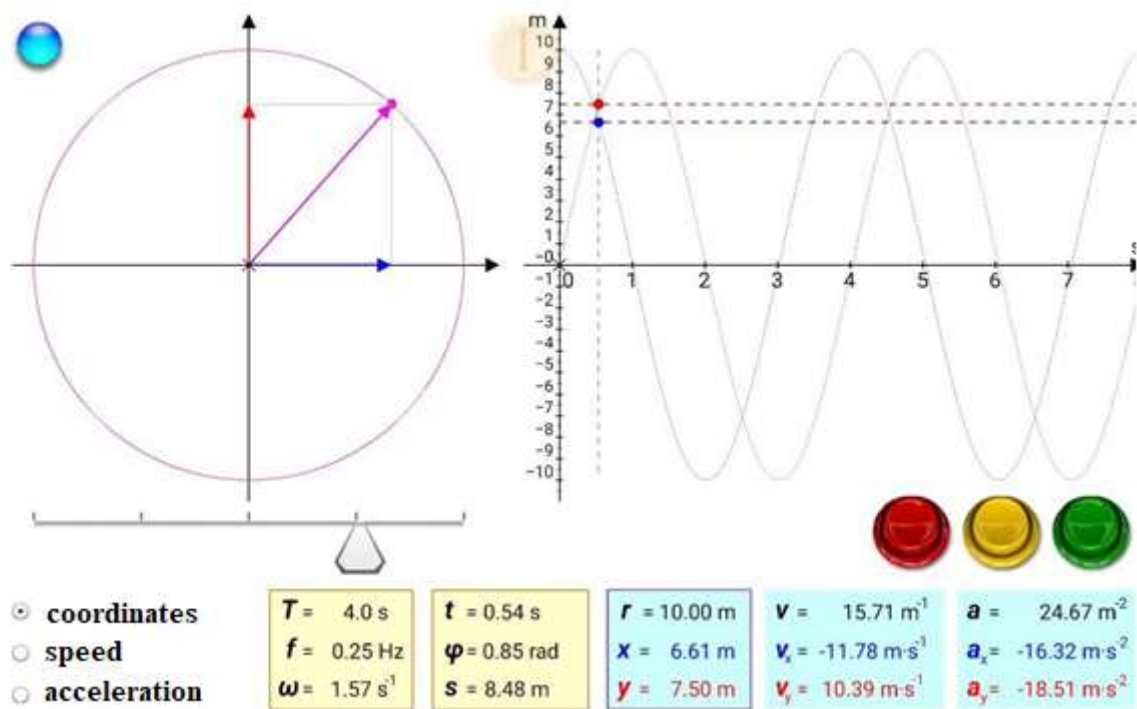


Figure 1. Section 1, item 7 of the "Physics at school" program - Time graph of the path of an object moving in a circle (in the I quarter)

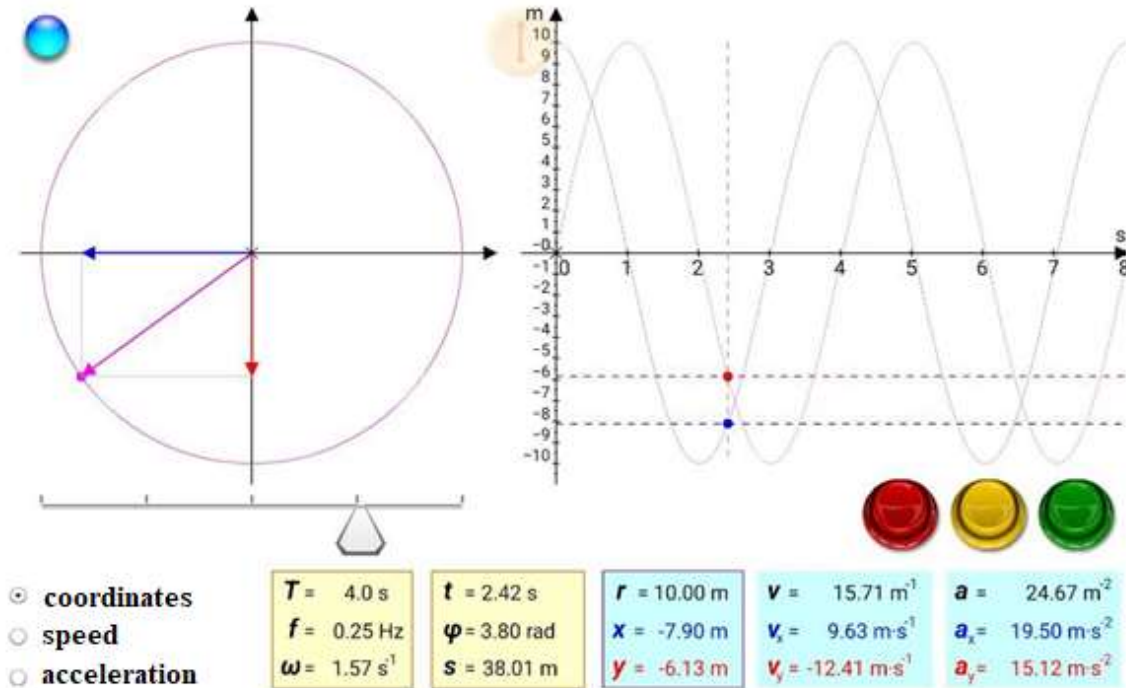


Figure 2. Section 1, item 7 of the "Physics at school" program - Time graph of the path of an object moving in a circle (in the III quarter)

Figure 1 shows the graph of the change in coordinates of an object moving in a circle. You choose the vibration period yourself. In accordance with this period, the program calculates the numerical value of the frequency, cyclic frequency, coordinates, speed and acceleration of the rotating body.

The use of electronic textbooks for grades 7-9 is of great importance. In the educational system, the above-mentioned programs have ready-made models, in which the user can widely use several types of work (laboratory, problem analysis, animations in presentation lectures) by entering the initial parameters.

Examples of programs that provide modeling of physical processes include: MatCad, MatLab, Maple, Math systems, Crocodile, Physics, Electronics Workbench and other software packages.

The use of computer models in educational processes, taking advantage of information technologies, is effective. The principles of using computer models in educational processes are as follows:

- ❖ the computer program should be used when it is impossible to conduct the experiment or the experiment is moving to an unobservable level;

- ❖ the computer program helps in identifying the studied detail or in illustrating the problem being solved;
- ❖ as a result of the work, students should know both qualitative and quantitative connections of quantities characterizing events with the help of a model;
- ❖ while working with the program, the students' task is to work on tasks of different difficulty, as this allows them to work independently.

Today, the use of modern information technologies, which differs from the traditional way of teaching, provides an opportunity to achieve high efficiency. In terms of teaching physics, it is important to develop effective methods of forming the imagination of models of theories in the minds of students, introducing them to phenomena and processes.

The process of computerization is progressing in such a way that in a few years every listener will be provided with a computer. Therefore, it is necessary to develop educational and methodological guides for the use of computers in educational processes. Teachers should use programs compatible with the physics program to students and listeners, show the convenient and understandable side of electronic textbooks and tasks. All science pedagogues are



tasked with using the electronic textbook in their classes and giving lectures using it.

Physical knowledge is widely used in information technology for computer modeling of physical processes.

Also, the unique important aspects of modeling are that it does not require the preparation of various physical tools and instruments, it is possible to describe phenomena in a vivid and natural way, to repeat the experience at any time in a short period of time, it is difficult to observe and can be observed at all. will have the opportunity to demonstrate the processes that are not

It is possible for the teacher to demonstrate many physical phenomena on a computer monitor, as well as with the help of a multimedia projector, and to improve a new non-traditional type of teaching. Every physics teacher should make proper use of computer curriculum in planning his physics lecture because computers can be used in any lesson. Therefore, it is necessary to know when and how to use the computer in order to plan it and achieve a positive result. With the use of computer software, computer lectures are more effective than regular lectures. This ensures that the curriculum is completed on time. In our experience, using computer programs to teach courses on physics and short fields of physics, conducting activities in the form of animation is not only convenient for the teacher and the student, but it is good for understanding the mechanisms and stages of physical processes. it should work. Taking this into account, organizing an animated display of the mechanisms of physical processes and the stages of their occurrence on a computer will be a visual, interesting and memorable activity for students. The mechanisms of physical processes, their demonstration in lectures, practical and especially laboratory classes and conducting these cases relying on computer technologies are one of the factors that increase the effectiveness of imparting knowledge to the student and creating skills related to the basics of science during the teaching process. serves as.

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