

# Innovative Approaches to Teaching Physics

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**Abstract:** Computer technology brings with it new opportunities and at the same time limitations. The learning process, the drawing of the modern lesson, the ways of interaction between teacher and students are changing. It is important not to get lost in the sea of electronic didactic teaching aids and choose the most effective ways to use them. The teaching of physics, due to the characteristics of the subject itself, is the most favorable area for the application of modern information technologies. For example, to form visual representations of the development of natural processes, the most effective will be the use of animated objects, schemes. To study the structure and functions complex object the most effective will be the use of interactive two-dimensional or three-dimensional model.

**Keywords:** Information and communication technology (ICT), physics, video clips, animations, multimedia lesson, Power Point.

## INTRODUCTION

A modern multimedia lesson is built on the same structure as the traditional one: updating knowledge, explaining new things, consolidating, controlling. The same methods are used: explanatory, illustrative, reproductive, partially search, and others. At the same time, the modern multimedia lesson is a transitional form from traditional education to open education, as feedback is organized with the user, it becomes possible to build an individual educational path in the information environment of a didactic teaching tool.

In electronic multimedia teaching aids, “text” as a carrier of educational material is already understood in the broad sense of the word, it is not only a written verbal text, but also a video fragment, animated diagram, model. The latter have a unique opportunity to increase the information density of the presentation due to the accelerated supply of information, therefore their didactic function is modified - this is not an illustrative material, but the most important source of information and an object for observation. The script of the lesson is its multimedia compendium containing a short text, basic formulas, drawings, drawings, videos, animations. Typically, these scenarios are prepared in the form of multimedia presentations using the Power Point program from the Microsoft Office suite. Presentations are demonstrated by the teacher himself directly in the physics room or in the lecture hall, equipped with a personal computer and a stationary multimedia projector. The image is projected onto a large wall-mounted screen in order to maximize the visualization of the educational process. This way is in many ways more advantageous: the problem of health conservation is solved (a large screen removes the need to limit the student’s work in front of the monitor screen); using a projector also allows you to more effectively manage the educational process [1].

## MATERIALS AND METHODS

Practice shows that, thanks to the multimedia accompaniment of classes, up to 30% of the study time is saved than when working at the blackboard. You don’t have to think that there isn’t enough space on the board, don’t worry about the quality of the chalk, whether everything written is clear. Saving time, you can increase the density of the lesson, enrich it with new content [2].

At the stage of explanation or when introducing new concepts, the computer can help the teacher increase motivation to study the subject, because it allows you to expand the visual range. Color photos and drawings the size of a blackboard are better than a black and white poster, and even more so than drawing with chalk on a blackboard. The modern photograph of the device and its circuit, placed next to it, will at least slightly bring the world of the school textbook into line with the surrounding world. Interactive objects based on drawings, photos, videos and animations also play the role of posters, only their individual fragments can be enlarged, changed color, “animated”, etc. It is obvious that such electronic versions of posters conceal new methodological possibilities [3].

Interdisciplinary communication (IDC) is a didactic condition for increasing the scientific level of students' knowledge, a condition for improving the entire educational process. Many technological processes in modern production can be understood only through the application of knowledge from the field of several sciences. One of the ways to increase the effectiveness of the educational process in the implementation of IDC is the use of information and communication technologies (ICT). Creative ICT teachers provide many opportunities for development and self-improvement.

## RESULT AND DISCUSSION

The use of ICT in the implementation of MEA allows:

- create positive motivation and increase interest in the study of educational material;
- visualize training material (electronic textbooks and manuals, video clips, animations);
- carry out modeling of complex physical processes and objects (laboratory work, problem solving workshop, creative tasks);
- carry out automated quality control of acquired knowledge (tests, tests, thematic crosswords).

The main directions in the work on the implementation of the MEA taking into account the capabilities of ICT:

- understanding the purpose of the creative task;
- continuity in the formation of terms that make up the task;
- search for analogues in related disciplines [4].

Video fragments allow explaining the principles of operation of modern technical devices, showing natural phenomena, complex physical experiments, entertaining experiments, toys, the action of which is based on effective physical phenomena, accompanied by an announcer's text. The demonstration captured on a digital video allows introducing into the methodology of teaching physics a discussion of experiments on equipment inaccessible to schools, using an experiment in a laboratory workshop to demonstrate phenomena, etc.

The use of video information and animation can greatly enhance the learning effect. It is a film, or rather a small educational fragment, that contributes to the greatest degree to visualization of the educational process, the presentation of animated results, simulation of various processes in real-time learning [5]. Where motionless illustration, a table does not help in training, a multidimensional moving figure, animation, cadroplane, video, and much more can help.

However, when using video information, you should not forget about maintaining the pace of the lesson. The video fragment should be extremely short in time, and care should be taken to provide feedback to students. That is, video information should be accompanied by a number of issues of a developing nature that cause the guys to dialogue, commenting on what is happening. In no case should you allow the transformation of students into passive contemplators. It is preferable to replace the soundtrack of the video fragment with the live speech of the teacher and students. Animation with good sound makes it easier to explain the principles of action of mechanical, electrical, optical devices, since it shows its work in dynamics, with enlargement of the parts of the device, from different angles.

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