**THE IMPORTANCE OF MODERN INFORMATION**

**TECHNOLOGIES IN TEACHING PHYSICS**

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**Abstract:** This article highlights the significance of modern information technologies (computer tools) in teaching physics and their effectiveness in modeling physical phenomena and processes.

**Key words:** simulation,information technologies, logical thinking and abilities, creative assignments.

In traditional education, demonstrations and visual aids are designed for specific time periods, with the educational process being more teacher-centric. The traditional teaching format focuses on achieving educational goals using traditional methods and teaching aids. However, the teacher's capabilities are often limited, and lecture content is restricted by the allotted time, leaving less room for comprehensive and clear explanations within the given timeframe.

Using modern information technologies (computers), the most effective way to conduct physics experiments is through specialized simulation software. These programs enable the simulation of real-world phenomena based on mathematical and physical models.

Several simulation programs are available for modeling phenomena and processes. Among them is the PhET (University of Colorado Boulder), a software that allows users to explore various physics experiments interactively.

They include:  
- Simulations and modeling: This involves computing physical laws and simulating them on a computer.  
- Virtual laboratories: These programs allow students to conduct experiments interactively.

Teaching lessons using modern information technologies focuses on a “student-centered” approach, employing modern teaching methods and innovative didactic tools to achieve guaranteed results in education. The use of information technologies creates broad opportunities for developing students' cognitive abilities, emphasizes independent learning, fosters exploratory and creative activities, and introduces a flexible lesson structure.

The traditional study of physics includes theoretical knowledge, problem-solving, and laboratory work. This method involves students learning theoretical material, gaining skills and experience through problem-solving, and performing laboratory tasks to consolidate their theoretical and practical knowledge. While this approach yields effective results, integrating modern information technologies into teaching physics by modeling physical processes on computers is more purposeful for enhancing educational outcomes.

**Key steps in the modeling process include:**

1. Familiarization with the physical model: Students study the model of the physical process created in the PhET environment.

2. Conducting experiments on a computer: Students perform simple pre-defined experiments using the physical process model in the PhET environment, complete calculations, and answer control questions based on their results.

Modeling physical processes plays a crucial role in improving teaching effectiveness. It involves formulating problems, selecting or constructing models of the studied processes, choosing appropriate methods to solve them, and studying these processes using information technologies. This approach allows students to quickly grasp the material, as it visualizes dynamic processes that are difficult or impossible to observe otherwise. It aids in understanding and analyzing essential physical processes, thereby enhancing students' comprehension of the material.

Using computers for modeling and solving problems, analyzing graphs, and conducting experiments is vital for teaching physics. It also enables students to individualize their education, develop independent thinking, and solve problems effectively.

**Benefits include:**- Enhancing the scientific level and depth of learning.  
- Improving students' logical thinking and abilities.  
- Increasing students' interest in studying physics.

Activities include solving experimental problems, verifying answers through computer models, and completing creative assignments where students independently formulate, solve, and model problems.

The described tasks foster students' understanding of physical processes, creativity, and comprehension of educational material. Using electronic models for class or independent study sessions ensures better understanding, quicker learning, and long-lasting retention of knowledge, sparking students' interest in physics.

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