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**Modern Methods of Teaching Physics in School: Interactive Technologies and Multimedia Resources**

**Abstract**

The article explores current approaches to teaching physics in schools with a focus on the use of interactive technologies and multimedia resources. It discusses the advantages and limitations of these methods as well as provides specific examples of their application in physics lessons. Special attention is given to analyzing how modern technologies influence students’ motivation and depth of knowledge acquisition.

**Keywords**

Multimedia resources, educational process, physics, interactive technologies, educational environment, deep understanding, key competencies, student development.

Introduction: The Digital Revolution in Today's World

Today’s world has become a realm of digital technology. Every sphere—industry, medicine, science, and education alike—has undergone a profound transformation through digitalization. With the advent of digital tools, teachers now have more opportunities for effective instruction and enhancing subject interest among students.

Transitioning to interactive methodologies brings about significant changes in pedagogical practices that directly impact student engagement. As noted by T.V. Karpacheva, “Information technologies increase lesson content density and ensure stronger retention of study material.” She emphasizes that such technologies are one of today’s most efficient ways to deliver information effectively [5, p. 3]. Similarly, T.B. Kazachkova points out that internet integration significantly enhances school education effectiveness, enabling students to participate in virtual competitions and non-profit online projects [4, p. 140].

Distinguishing Features of Interactive Techniques from Traditional Methods

Unlike traditional methods where the teacher primarily acts as a lecturer while students remain passive listeners, interactive techniques encourage active participation in learning activities. For example:

Stimulating discussions creates platforms for open exchange of opinions and critical analysis of physical phenomena, fostering analytical thinking and argumentation skills.

Organizing group projects promotes collaborative work on complex tasks requiring practical application of theoretical knowledge, developing teamwork and interpersonal interaction abilities.

Conducting both virtual and real laboratory experiments allows visualization of abstract concepts, hypothesis testing, and reinforcement of acquired knowledge at an empirical level.

This paradigm shift not only contributes to deeper comprehension but also cultivates critical thinking, self-learning capabilities, and problem-solving proficiency—key attributes necessary for success in contemporary scientific environments.

Opportunities Provided by Digital Tools

Digital instruments like computer simulations and measurement systems provide new perspectives for exploring physical principles. According to Sh.T. Malloboeva, when using interactive learning methods, students transform into full participants in the learning process, drawing upon personal experience as the primary source of knowledge acquisition [6, p. 136]. Direct involvement in interactive experiments—whether virtual or actual—offers insights into dynamic processes, making abstract theories tangible and strengthening interest in physics.

Moreover, advanced visualizations enhance classroom experiences, enriching lessons with engaging graphics and multimedia elements that boost learning outcomes. Researchers agree that integrating interactive technologies is essential to meet high standards demanded by today's educational system [3, p. 17].

Practical Implementation of Innovative Approaches

Creating mini-laboratories within classrooms offers hands-on experience for students who can conduct experiments themselves, utilizing available equipment and digital tools. R.M. Abdullaev highlights that this approach not only improves technical skills but also encourages creative thinking [1].

Thus, rather than merely improving grades, the goal here lies in creating an active learning environment where students actively engage in discovery. Collaborative formats and dialog-based interactions contribute to skill-building, including confidence and positive self-esteem.

Effectiveness of Multimedia Courses and Materials

New research focuses on designing multimedia courses and materials specifically tailored for future physics educators. Acquiring proficiency in using these tools will elevate professional preparation levels and align them with emerging educational demands. Studies indicate that such training increases student motivation and develops competence in managing the educational process. M.V. Abutin, K.P. Kolynko, and A.S. Chirtsev emphasize that “the extensive penetration of computer technologies into theoretical, experimental, and applied physics necessitates teaching methods for their utilization” [2, p. 11].

However, challenges exist regarding implementation, such as technological constraints, insufficient teacher preparedness, and lack of funding. Nevertheless, with proper institutional support and adequate teacher training, these obstacles can be overcome.

Conclusion

Innovative approaches to teaching physics based on interactive technologies and multimedia resources represent promising directions for advancing the educational system. They foster increased student interest and develop core competencies required for successful adaptation to an information-driven society. Future studies promise further improvements leading to optimal conditions for educating and nurturing upcoming generations.

As stated by L.S. Vygotsky, “Education is good only if it moves ahead of development,” which echoes the importance of integrating modern technologies into education to create new pathways for growth and advancement of our learners.

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