



THE USE OF MODERN INNOVATIVE TECHNOLOGIES IN TEACHING SPECIALIZED SUBJECTS

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ABSTRACT

This article discusses the importance of modern innovative technologies in teaching specialized subjects, their role in increasing the efficiency of education, and their contribution to developing practical skills. The advantages and opportunities of preparing students in line with modern requirements through the use of innovative approaches are analyzed. Additionally, practical suggestions are proposed to make this process more effective.

In the "Strategy-2027" program, the issues of developing higher education and creating modern conditions for the younger generation to acquire competitive and innovative knowledge have been defined as key directions. When speaking about the importance of higher education, the President of the Republic of Uzbekistan, Shavkat Mirziyoyev, emphasized: "A modern higher education system is the foundation of a country's development," stressing the significance of reforms aimed at improving the quality of education and strengthening practical knowledge.

Today, the integration of modern technologies into the educational system holds great importance. The use of innovative technologies not only enhances teaching efficiency but also allows students to be trained as qualified specialists with practical skills. In particular, the Action Strategy for the Development of the Republic of Uzbekistan in 2017–2021 identified the introduction of modern technologies into the education system as a priority task [1].

This article analyzes the role of innovative technologies in the educational process, challenges in their application, and possible solutions. In the modern educational system, the use of innovative technologies is considered one of the most pressing issues. Applying modern approaches in teaching specialized subjects is essential not only for effectively delivering theoretical knowledge but also for forming practical skills in students and preparing them to meet market demands as qualified personnel. The article examines the essence, areas of application, and advantages of using modern innovative technologies in teaching specialized disciplines.

The essence of modern innovative technologies. Innovative technologies introduce new approaches into the educational process. They make the learning experience more interactive, creative, and engaging. Modern innovative technologies are essential tools in

improving the quality of education [2]. The main types of modern innovative technologies used in teaching specialized subjects include:

- **Information and Communication Technologies (ICT):** Delivering educational materials through computer programs, internet resources, and online platforms. The significance of ICT in education has been recognized internationally. For example, World Bank reports highlight the role of ICT in improving education quality in developing countries [6].

- **Interactive Teaching Methods:** Project-based work, group activities, role-playing, and debates. The effectiveness of interactive methods in enhancing educational outcomes has been acknowledged in numerous studies [5].

- **E-learning:** Delivering knowledge through distance learning platforms (such as Moodle, Zoom, Google Classroom, etc.). During the pandemic, distance learning was highly valued as a tool to ensure the continuity of the educational process [4].

- **Simulation Technologies:** Preparing students for practical training through virtual laboratories. These technologies are particularly important for disciplines such as medicine and engineering [3]. For example, the Simulation Center at the Central Asian Medical University has proven effective in creating a near-real environment for developing practical skills and learning to manage complex processes.

Innovative technologies improve the quality of the learning process, strengthen interdisciplinary integration, and allow students to reinforce their theoretical knowledge with practical skills.

Application of innovative technologies in specialized subjects. Specialized disciplines are characterized by their theoretical and practical components. The application of innovative technologies in teaching these subjects is crucial in several directions:

1. **Transforming theoretical knowledge into practical skills:** For example, in engineering disciplines, software such as AutoCAD, MATLAB, or SolidWorks facilitates practical exercises. In medical fields, virtual anatomical simulators bring students closer to real-life situations [3].

2. **Using distance learning:** Distance learning platforms ensure the continuity of the learning process in unforeseen situations like pandemics. Additionally, online courses and webinars provide students with broad opportunities [4].

3. **Developing students' abilities:** Interactive lessons conducted with innovative technologies encourage students to think independently and creatively. Debates and role-playing games are effective tools in preparing students for real-life experiences.

4. **Simulation technologies:** In fields such as medicine, engineering, or aviation, simulation enables students to practice working in real-life scenarios. This plays a crucial role in preparing them for actual working environments.

Challenges and Solutions. The effectiveness of using innovative technologies in the educational process depends on many factors. However, certain difficulties also arise during implementation. These challenges must be systematically addressed and resolved.

Lack or obsolescence of technical equipment. The importance of technical infrastructure in the effective use of technologies in the learning process is significant. However, in many educational institutions, computers, projectors, internet connectivity, and other essential tools are either insufficiently available or outdated. Technical equipment that does not meet modern requirements restricts the learning process, complicates

communication between students and teachers, and hinders the full implementation of innovative approaches.

Solutions:

- Effectively utilize the state budget and international grants to strengthen the material and technical base of educational institutions.
- Regularly update technical equipment, including computer labs, laboratories, and tools for distance learning, based on modern requirements.
- Provide high-speed internet access in all educational institutions, particularly to create favorable conditions for distance learning.

Insufficient knowledge and skills of educators in using innovative technologies.

The effective use of innovative technologies by educators is a key factor in the educational process. However, many teachers lack the necessary skills to utilize such tools. For instance, difficulties in using distance learning platforms, modern software, or managing virtual laboratories hinder the full implementation of the process.

Solutions:

- Organize regular training sessions, seminars, and workshops to retrain and improve the qualifications of educators.
- Familiarize educators with international experiences in innovative technologies and expand their opportunities to participate in foreign educational programs.
- Establish a system of experience sharing among educators in educational institutions to create a collaborative environment for adopting advanced pedagogical technologies.

Students' adaptation difficulties to distance learning. The widespread introduction of distance learning technologies has created new opportunities in education. However, in some cases, students face challenges in adapting to the technical and methodological aspects of distance learning. These difficulties are due to:

- Limited access to the internet.
- Lack of skills in independently working with educational materials.
- Low interest in the online learning environment or unfamiliarity with this method.

Solutions:

- Develop special educational programs aimed at helping students successfully adapt to distance learning. These programs should focus on developing skills in finding educational materials, self-learning, and working with online platforms.
- Introduce interactive and engaging teaching methods to increase students' interest in distance learning (e.g., gamification, use of virtual reality elements).
- Enhance student engagement in the learning process through regular communication and feedback.

Conclusion and recommendations. The application of modern innovative technologies in teaching specialized subjects enables the training of highly qualified professionals. Cooperation among teachers, students, and educational institutions is of vital importance in this process. The following recommendations are proposed:

1. Expand state programs to widely implement innovative technologies;
2. Improve the quality of electronic educational resources and update them regularly;

3. Expand the use of virtual laboratories and simulation technologies to develop students' practical skills.

The integration of innovative technologies into the modern education system opens new possibilities for training professionals of the future.

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