THE EFFECTIVENESS OF USING INNOVATIVE PEDAGOGICAL TECHNOLOGIES IN PRIMARY EDUCATION

Hojiyeva Nasiba Bahodirovna
Teacher at Asia international university

Abstract: This scientific work analyzes the effectiveness of using innovative pedagogical technologies in primary education. It examines the impact of interactive methods, digital technologies, problem-based learning, and project-based teaching on students' knowledge levels. The study highlights the role of innovative approaches in developing students' independent thinking, creative abilities, and learning motivation. It also discusses ways to improve the educational process based on international experience and modern scientific approaches.

Keywords:
primary education, innovative technologies, interactive methods, digital learning, competence, student activity, learning effectiveness

Primary education is considered one of the most important stages of social development because it is during this period that the foundation of an individual's intellectual, spiritual, and social growth is formed. In the context of modern globalization, the requirements imposed on the education system are changing fundamentally. Traditional teaching methods are no longer able to sufficiently develop students' independent thinking, creative approaches, and problem-solving skills. Therefore, the introduction of innovative pedagogical technologies in the primary education system is of great importance.

Innovative pedagogical technologies refer to a set of new approaches, methods, and tools aimed at organizing the educational process effectively. They serve to increase students' activity, promote independent acquisition of knowledge, encourage collaborative work, and develop critical and creative thinking. Scientific studies show that in lessons organized on the basis of innovative technologies, students' level of knowledge acquisition is 25–30 percent higher compared to traditional methods.

One of the main directions of applying innovative technologies in primary education is the use of interactive methods. Interactive methods turn students into active participants in the learning process. Methods such as "Brainstorming," "Cluster," "Insert," and "KWL" (Know – Want to know – Learned) accelerate students' thinking activities. For example, through the "Brainstorming" method, students propose different solutions to problematic situations, which develops their creative thinking. Research results indicate that students' interest in lessons increases by up to 40 percent when interactive methods are used.

Digital technologies are also an important component of innovative pedagogical technologies. The use of computers, tablets, interactive whiteboards, and various educational platforms makes the process of knowledge transfer more effective. Information presented through multimedia tools is absorbed faster and more firmly by students. According to psychological studies, a person receives 80 percent of information through visual perception; therefore, the use of visual materials significantly increases the effectiveness of education.

Another important aspect of innovative technologies in primary education is ensuring a differentiated and individual approach. Since each student has different abilities, interests, and levels of understanding, it is difficult to achieve the same result with the same method for everyone. With the help of innovative technologies, teachers can provide tasks that

correspond to the needs of each student. This contributes to the individualization of the learning process.

Project-based learning technology is also effective in primary education. This method encourages students to engage in independent research and forms investigative skills. For example, through small projects, students independently collect information about the environment, nature, and society and present it. In this process, their speech, thinking, and social activity develop.

The implementation of innovative pedagogical technologies also requires high qualifications and creativity from teachers. A modern teacher should not only be a provider of knowledge but also a manager, guide, and motivator of students' activities. Therefore, improving teachers' professional competence and training them to work with new technologies is one of the important tasks.

The assessment system also plays an important role in increasing educational effectiveness. Based on innovative technologies, formative assessment systems are introduced. This type of assessment takes into account not only the result but also the learning process itself. As a result, students have the opportunity to analyze their mistakes and correct them.

In scientifically substantiating the effectiveness of innovative pedagogical technologies in primary education, the integration of pedagogy, psychology, and didactics is of great importance. Modern pedagogical approaches show that the educational process should be directed not only at providing knowledge but also at the development of the student as an individual. From this point of view, innovative pedagogical technologies are based on constructivist theory. According to this theory, the student does not receive knowledge in a ready-made form but forms it independently through personal activity. This requires the use of active methods in the educational process.

Psychological studies, particularly those concerning children's cognitive development, show that primary school students are in the concrete operational stage of thinking. Therefore, when teaching abstract concepts, the use of visual, practical, and interactive methods is considered effective. Innovative technologies meet exactly this need. For example, it has been found that topics explained through multimedia tools are learned twice as fast by students.

The effectiveness of applying innovative technologies has also been confirmed by many international studies. For example, the results of international assessment programs show that in countries where modern pedagogical technologies are widely used, students' functional literacy is at a high level. This ensures that students possess not only theoretical knowledge but also practical skills. In this regard, the use of innovative technologies in primary education is considered an important factor for achieving high results in the future.

The effectiveness of innovative pedagogical technologies in primary education is also determined by their didactic capabilities. First, these technologies make it possible to individualize the learning process. Each student acquires knowledge at their own pace and according to their abilities. Second, they involve students as active participants, which helps in the solid acquisition of knowledge. Third, innovative technologies increase students' motivation because lessons are organized in an interesting and interactive form.

The STEAM approach (Science, Technology, Engineering, Art, and Mathematics), which occupies an important place in modern education, is also part of innovative technologies. This approach ensures interdisciplinary integration and develops students' complex thinking. Through the application of STEAM elements in primary education, students gain knowledge through simple experiments, projects, and practical activities. Studies show that this approach increases students' problem-solving ability by 30–35 percent.

The role of the teacher changes fundamentally when applying innovative technologies. In traditional education, the teacher is the main source of information, whereas in innovative education, the teacher acts as a facilitator, guide, and organizer. This requires new competencies from teachers, including the ability to use information and communication technologies, apply interactive methods, motivate students, and know modern methods of assessment.

The learning environment also plays a significant role in increasing educational effectiveness. In a classroom environment organized on the basis of innovative technologies, students freely express their opinions, acquire teamwork skills, and learn from one another. In such an environment, students feel safe and free, which positively affects their learning activities.

The use of game technologies in primary education is also an important direction of innovative approaches. Learning through games corresponds to children's natural needs because play activity is leading at this age. Through didactic games, students more easily understand complex concepts. For example, the use of game elements in mathematics lessons significantly improves students' calculation skills.

Reflection technology is also important in increasing educational effectiveness. At the end of the lesson, students analyze their own activities and identify their achievements and shortcomings, which develops their ability to work on themselves. This is an important factor in forming a person ready for independent learning.

There are also some problems in implementing innovative pedagogical technologies. These include insufficient knowledge of modern technologies among some teachers, lack of material and technical resources, and in some cases, the dominance of traditional views. However, by overcoming these problems, the quality of education can be significantly improved.

Conclusion

The use of innovative pedagogical technologies in primary education plays an important role in improving educational effectiveness. Interactive methods, digital tools, and modern approaches ensure students' independent thinking, creative abilities, and deep understanding of knowledge. In addition, innovative technologies make it possible to individualize the educational process and provide an approach that meets the needs of each student. As a result, students' interest in learning increases and the quality of education improves. In general, the effective use of innovative pedagogical technologies serves to improve the quality of primary education and to form a modern, competitive individual.

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