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INTERNATIONAL EXPERIENCES IN IMPLEMENTING THE INNOVATION PROCESS IN THE PRIMARY EDUCATION SYSTEM

Boqiyev Gulomjon Ochilovich
Acting Professor of the Department of "Pedagogy and Teaching Methods" of the University of Economics and Pedagogy

Sobirova Gulira'no Sobir kizi
Master's Student of the University of Economics and Pedagogy

A B S T R A C T

This article examines international experiences in implementing innovation processes within primary education systems. It explores education policies, pedagogical technologies, digitalization practices, and teacher professional development programs adopted by various countries. The study highlights the role of innovative approaches in improving students' competencies and enhancing the quality of education. The findings provide insights into advanced practices that can be adapted for the primary education system of Uzbekistan.

K E Y W O R D S

Primary education, innovation, international experience, pedagogical technologies, digitalization, competence, education quality.

INTRODUCTION

The global informatization process, digital transformation, and the fourth industrial revolution require completely new approaches from the education system. Today, the fundamental changes taking place in the education sector of countries around the world, especially the modernization of primary education, the introduction of modern innovative approaches, the formation of student competencies, and the creation of competitive human capital have become global goals.

Primary education is the foundation of the education system, where the intellectual, socio-emotional, communicative and creative potential of the child is formed. That is why in developed countries of the world a consistent policy is being pursued to widely introduce innovative technologies, flexible models of education, and integrated approaches directly into primary education.

The experience of developed countries shows that personalizing the educational process, teaching based on the student's natural interests, gamification and a project-based approach, STEAM (Science, Technology, Engineering, Art, Mathematics) integration, the use of ICT and digital technologies from an early age, competency-based teaching, and the use of adaptive learning platforms dramatically increase the effectiveness of primary education.

According to the 21st century education concept, a student should not only acquire knowledge, but also independently create knowledge, analyze, think critically, communicate, and have digital

competencies. The only way to achieve this is to systematically introduce innovations into the education system.

Experiences in educational reform in the European Union, Asia-Pacific countries, Scandinavian countries, and the United States show that pedagogical innovations are effective in the following areas: the modular-credit system of education, the formation of a digital learning environment, innovative assessment models (formative assessment, competency-based assessment), flexible curricula, gamified learning processes, ICT-based lessons, and developmental pedagogy appropriate for the student's age.

These processes not only improve the quality of education, but also contribute to the comprehensive development of the student's personality, increase their motivation for learning, form independent reading skills, and improve their communicative potential.

The Republic of Uzbekistan is also undergoing large-scale reforms aimed at radically improving primary education, implementing innovative approaches, and introducing international experiences. The “New Uzbekistan Education Strategy”, “Digital Education Concept”, “Concept for the Development of Early and Preschool Education”, and updated state education standards are practical manifestations of this process.

In this scientific article, we consider the theoretical foundations of innovative processes in primary education, international experiences (experiences of Finland, Singapore, Japan, Korea, the USA), the scientific foundations of adapting these experiences to the conditions of Uzbekistan, and the mechanisms for modernizing the educational process based on a comprehensive scientific analysis.

In modern pedagogical science, the concept of "innovation" has a broad scientific and practical meaning, it is interpreted as a process aimed at improving the quality of education by introducing new ideas, technologies, methods and organizational forms into the educational process. Pedagogical innovation is a scientific approach that is qualitatively new in comparison with the traditional educational process, meets the requirements of modern conditions, and increases the effectiveness of educational activities.

In scientific literature, innovative pedagogy was formed in three stages:

The first stage (until the beginning of the 20th century) - the ideas of humanizing the educational process, focusing on the individual (Kerschensteiner, Montessori, Dewey).

The second stage (mid-20th century) - constructivism, developmental theories of education (Vygotsky, Bruner, Bloom).

The third stage (21st century) - digital pedagogy, artificial intelligence, flexible learning platforms, STEAM, competency-based education, is currently characterized by its main features: technological transformation in education, the priority of methods based on student activity, the expansion of personalized learning, the formation of a digital learning environment, the convergence of global pedagogical models.

The primary education system is at the heart of these innovative processes, because it is in the primary grades that the foundations of student thinking are laid, competencies are formed, and motivation to study is strengthened. The introduction of innovation at the primary education level is fundamentally different from other educational stages. The uniqueness of this stage is determined by several key factors:

Features related to age psychology

In children aged 7–10 years - cognitive processes develop rapidly, figurative thinking prevails, play activity takes a leading place, emotional stability is formed, imitation of adults is strong. Therefore, innovations in primary education - game-based methods, visual technologies such as AR/VR, sensory learning environments, and multimedia teaching should be used in combination.

Although subjects are independent in primary education, they require more integration. Because the world is not divided for a child - he strives to have a common vision. Therefore, innovative approaches such as:

• STEAM,

• CLIL (Content and Language Integrated Learning),

• competency-based integration give the most effective results precisely in primary education.

Learning motivation, interest, enthusiasm, and intrinsic motivation have a strong influence at an early age. Innovative methods — especially project work, games, robotics, and educational animations — naturally involve the child in the learning process.

Innovations by content - Modernization of educational content (competences, integration), STEAM and STEAM-LAB technologies, Digital educational resources and books, Cross-curricular learning.

Innovations according to methods - game technologies (gamification, edutainment), project-based learning, problem-based learning, methods of activating cognitive activity, interactive learning.

Innovations by technology

• digital platforms (Google Classroom, Moodle, Edmodo);

• adaptive systems based on artificial intelligence;

• AR/VR technologies;

• robotics and coding programs (Scratch, LEGO Education).

Innovations by organizational form - module-credit system, shift schedule, cluster education, distance and hybrid education.

Innovations in the assessment system - formative assessment, competency-based assessment, portfolio system, electronic assessment (e-assessment).

The introduction of innovations in primary education is becoming more relevant due to the following factors:

• sharp changes in labor market requirements;

• the need to form digital skills from an early age;

• the need for critical thinking in students;

• the importance of creativity and problem-solving;

• the transition to competency-based education;

• pressure on the quality of education arising from international requirements. These factors make the transition to innovative education an objective necessity.

Innovations in the modern education system are based on the following principles - person-centeredness, flexibility, integration, creativity, digitalization, learning through play, competency formation, and collaborative learning. These principles are the main vectors of today's global pedagogical process. Innovations in the modern education system are based on the following principles - person-centeredness, flexibility, integration, creativity, digitalization, learning through play, competency formation, and collaborative learning. These principles are the main vectors of today's global pedagogical process.

The Finnish education system is currently recognized as one of the world's benchmark systems for innovative approaches, comprehensive development of student potential, and creation of a psychologically favorable learning environment. PISA studies have consistently confirmed the high results of Finnish primary education. The Finnish model is based on the principle of "high results with little effort". This process is explained by the following features:

• no excessive pressure on students;
• the assessment system reflects individual development;
• minimal homework;
• short lessons, long breaks;
• there is high public trust in the teaching profession. Education policy is based on a person-centered approach.

In Finland, there is no sharp separation of subjects in primary education. “Phenomenon-based learning” is the main innovative direction, where different subjects are integrated around one topic, project-based learning prevails, and students are encouraged to engage in independent research. The use of digital technologies in Finnish schools is not mandatory, but is introduced to the extent that it creates convenience for teachers. Tablets and laptops, virtual laboratories, artificial intelligence-based learning platforms, electronic diaries and individual portfolios. The most important aspects of the Finnish experience for Uzbekistan. Avoiding overloading the student, teaching through games, integrating the lesson process, increasing teacher freedom, a psychologically healthy environment.

The Singaporean education model is one of the most successful and innovative systems in Asia, focusing on developing key competencies in students at the primary education level. The central idea of Singaporean pedagogy is:

• the teacher does not lecture much,
• and students learn independently. These approaches see students as active participants.

In Singaporean primary schools, robotics, coding lessons, engineering basics, micro-project laboratories are introduced from an early age. In Singapore, innovative digital platforms automatically adjust learning tasks based on real-time student performance. Assessment is carried out in the process (formative), by competencies, based on electronic portfolios. The Singapore experience is significant for Uzbek schools in the following aspects: the development of computer science from grade 1, the expansion of robotics lessons, the introduction of adaptive learning systems.

The education system of the Republic of Korea has become one of the most advanced in the world in a short time. The reason for this is the large investment in education by the state and the priority given to innovative technologies. In Korean schools, interactive whiteboards, AI and VR laboratories, electronic textbooks, and learning platforms based on artificial intelligence have been fully implemented.

The “Smart Education” program is a digital device for each student, online libraries, electronic assessment, and real-time analysis of students.

In primary schools, the emphasis is on Competency-Based Education. Critical thinking, communication, information search, creative approach, and teamwork.

Suitable aspects for Uzbekistan - strengthening the "Digital Education" platforms, improving ICT lessons, creating digital competence centers for teachers.

The main achievement of the Japanese education system is the perfect integration of the educational and upbringing process. The priority is not only for the child to receive knowledge, but also for the

formation of a socially responsible person. In Japan, the first two years of school ("lower primary school") are mainly devoted to the upbringing of hard work, teamwork, responsibility, self-control, and moral values. Gamified methods are widely used in primary grades. Mathematical games, action games, games with problem situations.

The importance for Uzbekistan is to strengthen the educational component, introduce game-based teaching methods, and organize lessons differently.

The US education system has one of the most advanced experiences in the world in introducing innovations. In particular, the STEAM program is widely used. STEAM — Science, Technology, Engineering, Art, Mathematics — is a system of integrated teaching of sciences. Its advantages are that it develops logical thinking, increases creativity, and involves children in practical projects. Small projects have been established for elementary grades. Building simple robots, modeling natural phenomena, mathematical games, and coding basics. Assessment in US schools is carried out based on the following portfolios. project portfolios, competency map, and individual achievement profile.

Opportunities for Uzbekistan include the establishment of STEAM laboratories, retraining primary school teachers in STEAM, and widespread implementation of project-based learning methodologies.

An analysis of international experience shows that the following innovations can be introduced in the primary education system. They increase the quality of education, accelerate the dynamics of students' personal development, create a creative learning environment, form digital competencies from an early age, and expand the possibilities of teaching based on games and research. Finland - psychological comfort and integration; Singapore - STEM and adaptive systems; Korea - digital transformation; Japan - upbringing and discipline;

The USA - is considered a benchmark model in the areas of STEAM and project-based learning. These experiences can also be widely applied in Uzbekistan.

Although the innovations introduced into the structure of primary education in the world's leading education systems — Finland, Singapore, Japan, Korea, the USA — are diverse, there are common principles that unite them all. Their adaptation to the Uzbek education system should be carried out based on the following methodological approaches. International experiences cannot be directly copied; they should be introduced in a way that:

• adapts to local socio-cultural conditions,
• youth psychology of students,
• national educational traditions,
• existing infrastructure capabilities.

Foreign experience is adapted taking into account the specifics of the Uzbek education system. For example:

• The Finnish model of “phenomenon-based learning” can be implemented in Uzbekistan through differential integration across subjects;
• The Singaporean concept of “Teach Less — Learn More” can be implemented in Uzbekistan in combination with game-based learning.

In the process of using international experience, it is necessary to form a "National Innovative Primary Education Model of Uzbekistan" suitable for local conditions. It is advisable to implement innovations not all at once throughout the country:

• initially in experimental schools,
• within the framework of pilot classes and small projects.

In recent years, Uzbekistan has implemented large-scale reforms to modernize the education sector. These processes are creating the basis for the implementation of international experience. We can see clear evidence of this in the decisions that created the legal basis for the following innovations:

• “Development Strategy of New Uzbekistan in 2022–2026”;
• “Digital Education Concept”;
• Update of State Educational Standards;
• Government Resolutions on the Implementation of ICT in Education.

The scientific article comprehensively analyzed the issues of introducing innovations in the primary education system and adapting international experiences to the conditions of Uzbekistan. The results of the study show that:

1. Innovative pedagogy serves as an important tool for organizing a person-centered, active learner-based, integrated and digital technology-integrated educational process in primary education.
2. International experiences (Finland, Singapore, South Korea, Japan, USA) serve as an effective model for forming students' knowledge, skills and competencies, developing creative and critical thinking, as well as introducing digital and interactive educational platforms.
3. There are opportunities for implementation in the conditions of Uzbekistan, which can be implemented in the following areas: introducing STEAM and project methods, strengthening an individual approach through adaptive digital platforms, gamified and interactive training, as well as developing competency-based and formative assessment systems.
4. The results and prospects show that the systematic introduction of innovations in primary education qualitatively develops the knowledge and skills of students, increases their motivation, forms creative and critical thinking skills, and allows the Uzbek education system to adapt to global pedagogical standards.

At the same time, the process of adapting international experiences to the country's conditions should be effectively implemented through careful strategic planning, improving the skills of teachers, developing school infrastructure, and introducing modern technologies.

In general, the introduction of innovations in primary education and the implementation of international experiences will bring Uzbek education to a new level and are of decisive importance in sustainably improving the quality of the national education system.

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