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MODERN TECHNOLOGIES FOR OPTIMIZING THE PROCESS OF EDUCATIONAL PROGRAM DEVELOPMENT

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Abstract

The study examines contemporary approaches to the use of digital technologies in the development of educational programs for preschool institutions. Both international and national experiences in implementing information and communication solutions that ensure flexibility, adaptability, and individualization of the educational process are analyzed. Particular attention is given to the impact of digitalization on the quality of program design and implementation, the role of educators in a digital environment, and the conditions necessary for effective transformation of the educational system. Based on the analysis, recommendations are proposed to improve the content and methods of preschool education in line with modern technological trends.

Keywords: Digitalization, preschool education, educational program, systemic approach, ICT, digital pedagogical culture.

Introduction

Modern preschool education is undergoing significant changes driven by global digitalization processes. Sociocultural, economic, and technological transformations are shaping new requirements for the content and quality of education. Under these conditions, traditional approaches to designing educational programs no longer meet the demands of the time. The transition to a digital model of education has become a natural stage in the development of a

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system focused on innovation, openness, and the individualization of the educational process.

One of the most effective directions in the modernization of preschool education is the introduction of modern digital technologies that ensure the systematization, flexibility, and adaptability of the educational process. Information and communication technologies (ICT) make it possible to design educational programs that take into account the individual characteristics of children's development, provide continuous monitoring of learning outcomes, and improve the quality of management decisions in preschool educational organizations [3]. Thus, the optimization of educational program development through the use of digital technologies represents a strategic priority in the modernization of preschool education in Uzbekistan and other countries focused on innovative development [**Error! Reference source not found.**].

Digitalization of education is not merely the introduction of technology or the use of online tools, but a comprehensive methodological and organizational transformation of the entire educational system. It affects the goals, objectives, content, and forms of educational activities, as well as the methods of interaction among all participants in the educational process — children, teachers, and parents. Modern information and communication technologies (ICT) perform several key functions in preschool education: analytical, communicative, organizational-managerial, and developmental [**Error! Reference source not found.**]. They make it possible to collect and analyze data on children's development and achievements, ensure effective interaction among teachers, parents, and administrators, automate planning, reporting, and monitoring processes, and expand children's opportunities for learning and independent exploration of the world.

The use of ICT contributes to the development of evidence-based pedagogy grounded in data analysis and scientific evidence. Digital platforms enable teachers to track each child's developmental progress, identify individual needs, and adjust the content of the educational program in real time. This approach ensures the validity of pedagogical decisions and enhances their effectiveness in achieving educational goals.

The digitalization of preschool education is a global trend. The experience of countries such as Finland, South Korea, and Canada demonstrates that ICT can become not just a tool for learning but the foundation of a modern educational

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system. In Finland, the ViLLE platform is used to help educators plan and record learning outcomes, as well as analyze data on each child's developmental progress. The system creates individual profiles, which supports the flexible design of educational programs. In South Korea, state educational modules include multimedia learning materials, interactive games, audio and video lessons, and parental control tools. In Canada, digital portfolios and mobile applications are actively used to ensure transparent interaction between teachers and parents. These examples show that the use of digital technologies not only enhances the manageability of the educational process but also contributes to the creation of adaptive and individualized learning programs.

In recent years, Uzbekistan has taken active steps toward the digital transformation of preschool education. One of the most important achievements has been the implementation of the E-Maktab platform, which provides teachers and administrators with access to electronic journals, programs, and planning tools.

In 2024, the Presidential Decree of the Republic of Uzbekistan No. UP-152 (September 30, 2024) was adopted, providing for the creation of digital systems for monitoring the quality of preschool education [**Error! Reference source not found.**]. In addition, the Program for the Digital Transformation of Preschool Education is being implemented, aimed at developing infrastructure, improving teachers' qualifications, and creating a unified digital ecosystem. However, certain challenges remain: insufficient digital literacy among teachers, especially in rural areas; weak internet coverage; uneven access to technological equipment; a shortage of adapted digital resources in the Uzbek language; and the absence of a unified analytical platform. Nevertheless, some preschools—particularly in Tashkent—are already demonstrating successful practices, such as the introduction of electronic diaries, digital monitoring systems, and tools for tracking children's development. These examples confirm the potential of digital solutions to improve the quality of preschool education and the efficiency of educational organization management.

Modern digital technologies make it possible to systematize and simplify the process of developing educational programs. Among the most effective tools are online program constructors (E-Maktab, Google Workspace), which allow flexible content design in line with educational goals; digital libraries and resources (Respublika Bolalar Kutubxonasi, Eduten Play), offering interactive

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books and educational cartoons; electronic document management systems (Microsoft Teams, Zoom, Google Drive), which enhance transparency in planning and communication among educators; diagnostic platforms (Learning Genie, Kinderpedia), enabling the creation of individualized educational pathways; and interactive technologies such as SMART Boards, augmented reality (AR), and digital sandboxes that stimulate children's cognitive activity and increase their interest in learning. These solutions not only facilitate teachers' work but also create a scientifically grounded foundation for a systemic approach to the design of educational programs.

For the successful digital transformation of preschool education, a number of conditions must be met. First, it is necessary to ensure the systematic training of teachers and the development of digital pedagogical culture, which includes skills in working with analytical data, information visualization, and digital platforms [**Error! Reference source not found.**]. Second, it is important to provide methodological support for teachers through the development of guidelines, scenarios, and algorithms for the effective use of ICT in the educational process. Third, a well-developed infrastructure is essential — including modern equipment, stable internet access, and technical support. Fourth, it is necessary to improve the regulatory and legal framework to ensure the protection of personal data and the digital safety of children. Finally, a key direction is the creation of a unified digital educational platform within the framework of the "Digital Uzbekistan — 2030" strategy [**Error! Reference source not found.**], that integrates the functions of program design, monitoring, interaction, and teacher training.

In the future, the use of artificial intelligence (AI) for analyzing educational data will become increasingly significant. Neural network technologies make it possible to predict the effectiveness of educational programs, identify weak points, and provide automated recommendations for improving the content and logic of learning. This frees teachers from routine tasks, allowing them to focus on the creative and developmental aspects of their work. At the same time, digitalization does not replace the teacher — it expands professional capabilities, enhancing the teacher's role as a designer of the educational process and a mediator between the child and the digital environment. The level of a teacher's digital culture directly determines the quality of educational program

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implementation and the success of children's development in a digital society [**Error! Reference source not found.**].

The integration of digital technologies into the process of developing educational programs is a strategic direction in the development of preschool education. It enables the creation of flexible, evidence-based, and individualized programs, ensuring improved quality of education and more effective management. For Uzbekistan, the digitalization of the preschool sector represents not only a technological transformation but also a cultural shift that contributes to the development of human resources, the strengthening of an innovative environment, and the enhancement of the overall competitiveness of the educational system.

Digital technologies are becoming not just a tool but a philosophy of modern education, focused on the development of the child's personality, collaboration between teachers and parents, and the creation of a unified digital space that connects all levels of educational interaction. Their implementation paves the way for building a sustainable, flexible, and high-quality system of preschool education that meets the challenges of the 21st century.

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