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ISSUES IN ORGANIZING INCLUSIVE EDUCATION: HUMAN RESOURCE CAPACITY, PEDAGOGICAL TECHNOLOGIES, AND THE INTEGRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES

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Abstract

This article provides a comprehensive analysis of contemporary issues in organizing inclusive education. The research examines the pedagogical workforce capacity, teacher preparation and motivation, the role of teaching assistants, the application of pedagogical technologies and interactive methods, as well as the integration of information and communication technologies (ICT) and assistive devices into the educational process. Based on studies conducted by UNESCO, OECD, the World Bank, and the European Agency for Special Needs and Inclusive Education, international experience (Finland, Canada, the United Kingdom, the United States, Australia) is analysed in comparison with the national model of Uzbekistan. The article highlights the effectiveness of methodologies such as Universal Design for Learning (UDL), scaffolding, peer-tutoring, and project-based learning. In conclusion, strategic recommendations are proposed for the consistent development of inclusive education in Uzbekistan.

Keywords: Inclusive education, pedagogical staff, teacher competence, assistive technologies, ICT, Universal Design for Learning, scaffolding, individual education plan, neurodiversity, professional burnout.

Introduction

Inclusive education has become one of the central directions of 21st-century educational policy, and its core essence is grounded in the humanistic principle that “no child should be left behind in education.” According to UNESCO data, there are approximately 240 million children with disabilities worldwide, and

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ensuring their right to quality education is considered one of the key indicators that determines a society's level of sustainable development. According to a joint report by the World Health Organization (WHO) and UNICEF, more than 50 percent of children with disabilities in developing countries are deprived of access to education — a situation assessed not only as a violation of human rights, but also as a loss of society's intellectual and economic potential.

In the Republic of Uzbekistan, the development of inclusive education has been designated as one of the priority directions of state policy. Presidential Decree No. PQ-4860 of October 13, 2020, "On Measures to Further Improve the System of Education and Upbringing for Children with Special Educational Needs," along with the Concept for the Development of Inclusive Education in the Public Education System for 2020–2025, consolidated the legal and organizational foundations of this process. However, practice demonstrates that legal documents and infrastructure alone are insufficient — the true effectiveness of the system is directly linked to the human factor, namely the capacity of pedagogical personnel, their technological competence, and psychological readiness.

The purpose of this article is to analyze the complex problems of organizing inclusive education along three primary dimensions: first, the personnel system and teacher preparation; second, pedagogical technologies and interactive methods; and third, the integration of information-communication and assistive technologies into the educational process. The analysis draws on international experience, particularly studies conducted by UNESCO, OECD, and the World Bank, as well as the national context of Uzbekistan.

The most critical factor determining the effectiveness of an inclusive education system is the capacity of pedagogical personnel. This system requires a multidisciplinary team of professionals: general education teachers, special educators (defectologists), psychologists, speech therapists, and teaching assistants. According to OECD research, the most important condition for inclusive education is not the expertise of an individual specialist, but rather the ability of this team to work collaboratively through team teaching. Such an approach makes it possible to adequately meet the individual needs of students.

However, international research shows that in many countries teachers are not sufficiently prepared to work in inclusive classrooms. The main challenges include: difficulties in developing individual education plans, insufficient knowledge of the psychology of children with special needs, excessive workload,

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and a shortage of methodological materials. According to research conducted at Monash University in Australia, teachers most frequently express a need for ongoing professional training and practice-oriented professional development programs.

Teaching assistants play an important role in inclusive education — they provide individual support to students while supporting the lead teacher. However, in practice, several problems are observed: the lack of clear definition of their responsibilities, weak collaboration with the teacher, and in some cases, restriction of the student's independence. For this reason, it is necessary to standardize their role and establish clear criteria. According to UNESCO data, in many countries — particularly developing ones — a shortage of special educators results in severely overcrowded classrooms, making the implementation of an individual approach considerably more difficult.

Another important yet often overlooked aspect of the personnel issue is the psychological condition and motivation of teachers. Research conducted in Australia and European countries indicates that 40 to 60 percent of teachers working in inclusive classrooms experience burnout syndrome. The primary causes are the large number of individual needs within a single classroom, insufficient time, the necessity of an individual approach for each student, and a shortage of resources. According to OECD research, in schools where teacher motivation is high, the outcomes of inclusive education are noticeably better — which is why the introduction of psychological support and motivational training for teachers holds significant importance in contemporary educational policy.

Among the most advanced models in international experience is the Finnish approach: in Finland, an individual plan is developed for each student, and a robust psychological support system is in place. The Canadian model is based on integrated classrooms and specialized resource centers. In the United Kingdom, the Individual Education Plan (IEP) has been introduced as a mandatory system, and the teacher certification mechanism is strong. In schools in the United States and the United Kingdom, a permanent team consisting of a special educator, psychologist, and speech therapist works alongside the teacher in each inclusive classroom. In Uzbekistan, while the concept of a "multi-branch team" exists in legislation, in practice there is a felt shortage of specialists such as speech therapists, defectologists, and surdopedagogues — as a result, the burden of inclusive education frequently falls upon the classroom teacher alone.

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At the practical stage of inclusive education, pedagogical technologies serve not merely as a method of delivering lessons, but as a strategic instrument for bringing out the inner potential of each student. A modern inclusive lesson requires the teacher to create a student-centered environment, in which the process of knowledge transmission is transformed from one-directional lecturing into multi-directional dialogue and collaboration. This approach makes it possible to view the diversity within the classroom not as a problem, but as a rich resource for mutual learning and the exchange of social experience.

One of the most effective methods is the Scaffolding technology, grounded in Lev Vygotsky's developmental theory. In an inclusive classroom, the teacher systematically provides a "support" to the student until a particular skill is mastered, and these supports are gradually removed as the child develops self-confidence. This approach is especially significant for children with cognitive or physical developmental differences, as it reduces the fear of failure and cultivates intrinsic motivation in the student.

Cooperative Learning technologies also constitute an inseparable component of an inclusive environment. In this method, students are divided into small groups and work together toward a common goal. An important feature is that each child has a specific role: one collects information, another visualizes it, another presents the results. The peer-tutoring method also demonstrates high effectiveness — research confirms that children are able to explain concepts to one another more easily than to adults. In this process, the student acting as "tutor" also reinforces their own knowledge, and most importantly, human qualities such as empathy, tolerance, and responsibility are developed.

Project-Based Learning holds special significance as a technology oriented toward fostering creative thinking and solving real-world problems. In the course of a project, a student gains the opportunity to apply theoretical knowledge in practice, and conditions are created for each child to demonstrate their own strengths. Interactive game-based technologies are also among the best methods for conveying complex topics in a simple and engaging manner — particularly effective when working with children who have speech impairments or who are on the autism spectrum, since play represents the most accessible model of social interaction.

In an inclusive educational environment, information-communication technologies (ICT) are not merely tools for enriching lessons, but serve as the

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primary gateway to an accessible world for students with special educational needs. The suite of tools known in academic circles as "assistive technologies" serves to expand the educational opportunities of children with visual, auditory, speech, or motor impairments. According to a report by the European Commission, digital technologies can make inclusive education 30 to 40 percent more effective — but only when teachers have undergone specialized training.

For students with visual impairments, screen-reading programs (JAWS, NVDA, VoiceOver) and Braille-based digital displays convert textual information into auditory or tactile form, enabling children to independently read textbooks and access internet resources without restriction. For students with hearing difficulties, speech-to-text programs, automatic captions, and video lesson resources play an important role. For children with autism spectrum disorder or Attention Deficit Hyperactivity Disorder (ADHD), visual supports, interactive graphic organizers, and specialized mobile applications assist with scheduling and with breaking down lesson material into small, comprehensible segments.

In addition to software, physical assistive devices — adapted keyboards, trackballs, and eye-tracking devices — enable students with musculoskeletal impairments to use computers independently. Adaptive platforms powered by artificial intelligence (such as Khan Academy and Duolingo) automatically generate an individualized learning path for each student. Research indicates that adaptive systems can increase the academic performance of students with special needs by 20 to 30 percent.

One of the most authoritative international models for designing inclusive lessons is the Universal Design for Learning (UDL) concept, developed by CAST (Center for Applied Special Technology) in the United States. This methodology, founded by Anne Meyer and David Rose in 2002, sets as a standard the selection of ICT tools that align with the brain's learning networks — recognition, strategic, and affective networks. Research conducted in schools across the state of Massachusetts found that the correct combination of multimedia and assistive technologies increased students' academic achievement by an average of 22 percent.

The results of the "Maximising the Impact of Teaching Assistants" (MITA) project, conducted between 2011 and 2015 by the Institute of Education at University College London (UCL), showed that in classrooms where interactive collaboration between teachers and technology was properly organized, the on-

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task behavior time of students with special needs expanded by 30 percent. The "Ramp-up" project conducted by the University of Jyväskylä in Finland demonstrated the effectiveness of digital portfolios: in classrooms with real-time digital feedback, students' levels of psychological anxiety decreased and their self-assessment skills developed.

The Individual Education Plan (IEP) electronic monitoring system used in Ontario Province, Canada, enables the assessment of ICT effectiveness for each student with special needs not through a graded scale, but through indicators of "functional growth." For instance, at the conclusion of a monthly plan, the primary indicator of lesson effectiveness is the percentage to which a student with limited speech was able to independently express their thoughts using Augmentative and Alternative Communication (AAC) devices. These experiences confirm that desired outcomes are achieved in inclusive lesson design only when technology and the human factor operate in harmony.

Among social-cultural barriers, the phenomenon of stigma occupies a distinct position. In Western European countries, inclusivity has become a cultural norm shaped over decades, and parents naturally accept the idea of children with and without disabilities learning together. In our society, however, unfounded fears still persist among parents of children without disabilities — the notion that inclusive classrooms slow the pace of learning. In reality, research shows that in inclusive classrooms, all students — whether with or without special needs — achieve higher academic and social outcomes as a result of mutual learning. Australian experience demonstrates that such barriers can only be overcome through broad-scale social campaigns and systematic outreach work with parents.

Legal-institutional barriers are associated with the fact that, despite the existence of legal documents, the mechanisms for their implementation have not been sufficiently developed. The weak coordination among various agencies (the Ministry of Education, the Ministry of Health, and the Ministry of Labor and Social Protection), as well as the ambiguity of funding standards and oversight mechanisms, weakens the system. As solutions, contemporary educational science offers a number of tools: the UDL approach, assistive technologies, multimodal instruction (combining visual, auditory, kinesthetic, and tactile channels), and Peer Support Programs — Canadian and Australian experience confirms that these programs accelerate the development of social skills by 40 percent.

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The Uzbekistan national model is currently undergoing a stage of assimilating international best practices while simultaneously transforming in a way that preserves its own historical and cultural characteristics. Among the existing shortcomings, one may note that ICT tools are not equally available across all schools, and that teachers have not yet developed sufficient skills for utilizing the available equipment. This creates a digital divide, widening the gap in inclusive education quality between rural and urban schools.

At the same time, the national model also possesses its own distinctive strengths. The strong role of the "mahalla" (community) and family institutions in the education system serves as an additional resource for the social support of children. The strategic documents adopted by the state within a short period of time attest to the existence of a firm political will to develop inclusive education. As acknowledged by UNICEF experts, the pace at which Uzbekistan is transitioning to inclusive education is among the highest in the region.

Based on the results of the analysis, the following strategic directions are proposed for the consistent development of inclusive education in Uzbekistan: first, improving the legal framework — adopting a dedicated inclusive education law and clearly defining material standards, funding norms, and oversight mechanisms; second, introducing a modern model of teacher training — mandating the "Inclusive Pedagogy" course across all pedagogical faculties, expanding the number of defectologists and speech therapists, modeling disability scenarios through virtual reality, and developing a mentorship system; third, improving ICT infrastructure and systematically enhancing teachers' digital competencies; fourth, promoting inclusive values through media and social platforms, and organizing seminars for parents; fifth, introducing a monitoring system — establishing clear indicators across participation, academic outcomes, socialization, and parent satisfaction.

The analysis conducted demonstrates that the effectiveness of an inclusive education system depends on the harmonious integration of three interrelated factors: first, the capacity of personnel and the professional and psychological readiness of teachers; second, the correct application of modern pedagogical technologies and interactive methods; and third, the skillful integration of ICT and assistive technologies into the educational process. Legal documents or infrastructure alone are insufficient — the true effectiveness of the system is determined by the human factor.

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International experience (Finland, Canada, the United Kingdom, the United States) proves that the success of inclusive education is ensured through the collaboration of a multi-branch team of personnel, the mandatory introduction of individual education plans, ongoing teacher certification, and the continuous development of technological competence. Methodologies such as Universal Design for Learning, Scaffolding, peer-tutoring, and Project-Based Learning serve as a solid methodological foundation for recognizing and developing each child's individual potential within a collective environment.

In the context of Uzbekistan, the consistent development of inclusive education requires a comprehensive approach: improving the legal framework, aligning the teacher training system with international standards, developing ICT infrastructure equitably across all regions, fostering an inclusive culture in society, and introducing a clear monitoring system. The success of inclusive education is embodied in the philosophy of viewing each child not as a "problem" but as a "potential." Only when a teacher's attitude toward a child, their professional mastery, and the boundless possibilities of technology come together in harmony can genuine educational equality be achieved.

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