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## SCIENTIFIC AND METHODOLOGICAL FEATURES OF INCLUSIVE EDUCATION IN THE DIGITAL LEARNING ENVIRONMENT

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### ABSTRACT:

This article analyzes the scientific and methodological features of inclusive education in a digital learning environment. The study explores how to organize inclusive education based on modern information and communication technologies, effective ways to engage students with special educational needs in digital learning processes, current trends in the digitalization of inclusive education, and advanced foreign experiences in this field. The article discusses the pedagogical, psychological, and technological aspects of inclusive digital education and examines the potential for applying these experiences in the context of Uzbekistan. Based on the research findings, scientifically grounded recommendations and proposals for the development of inclusive education in a digital learning environment have been developed.

**Keywords:** Inclusive education, digital learning environment, special educational needs, students with special needs, digital pedagogy, adaptive technologies, universal design for learning.

### INTRODUCTION

One of the most important directions of the modern education system is to create opportunities for all students to receive quality education. The concept of inclusive education serves precisely this goal, focusing on organizing the educational process while considering the individual characteristics, abilities, and needs of every student. In recent years, the rapid development of digital technologies has also opened new opportunities and prospects in the field of inclusive education.

Along with the paradigm shift in 21st-century education, there is a deep integration of digital technologies into the educational process. This, in turn, creates opportunities to elevate inclusive education to a new level. Organizing inclusive education in a digital learning environment can help eliminate existing barriers to education for students with special needs, expand their participation in the learning process, and improve educational outcomes.

In the modern world, the concept of inclusive education goes beyond integrating children with physical or mental disabilities into general education environments. It emphasizes meeting the individual educational needs of every child. Digital technologies play a vital role in this process by enabling the adaptation of educational materials, creation of personalized learning trajectories, and organization of the learning process tailored to the individual capabilities and needs of students.

At the same time, organizing inclusive education in a digital learning environment involves a range of scientific and methodological characteristics that require special study. This article analyzes these characteristics and aims to develop effective educational strategies in this direction.

**The relevance of this study is determined by the following factors:**

1. The legal foundations for inclusive education are outlined in the Law of the Republic of Uzbekistan "On Education";
2. The "Digital Uzbekistan - 2030" strategy identifies the digitalization of education as a priority area;
3. The importance of the digital learning environment increased significantly during the COVID-19 pandemic as remote education was widely implemented;
4. Improving the quality of education for students with special needs is one of the state policy's priority areas.

## METHODS

The concept of inclusive education has gone through a long historical development. As Florian notes, the idea of inclusive education emerged during the transition from a model of separating individuals with special needs from society to a model of their full integration into it. Uzbek scholar Yusupov defines inclusive education as "an education system that aims to meet the educational needs of all students and create opportunities for them to receive quality education while considering their individual characteristics."

UNESCO documents define inclusive education as "a process of responding to the diverse needs of all learners, increasing their participation in learning and cultural life, and reducing discrimination within the education system to achieve equity." This highlights the main goal of inclusive education: to create equal opportunities for all students.

Ainscow identifies four key principles of inclusive education: inclusion is a continuous process; it involves eliminating all barriers; it ensures participation for all students; and it focuses on the achievements of all learners.

Research conducted in Uzbekistan by Irgashev distinguishes the following stages in integrating students with special needs into the educational process:

- **Segregation:** such students are educated in specialized institutions;
- **Integration:** students study in general education institutions, but without special conditions;
- **Inclusion:** the learning environment is adapted to meet the needs of all students.

**The following methods were used in this research:**

1. **Theoretical analysis** – scientific literature, legal documents, dissertations, and other sources related to the topic were studied.
2. **Comparative analysis** – foreign experiences in organizing inclusive education within digital learning environments were reviewed and compared.
3. **Systemic approach** – the pedagogical, psychological, and technological aspects of inclusive education in digital environments were studied as an integrated system.
4. **Surveys and interviews** – teachers, special educators, and parents were surveyed regarding the organization of inclusive education in digital settings.
5. **Statistical analysis** – the results of the surveys were analyzed statistically.

## DISCUSSION

The concept of inclusive education implies an approach to the educational process that considers each student's individual characteristics and needs. According to UNESCO, inclusive education is “a process of responding to the diverse needs of all learners, expanding their participation in education and cultural life, and reducing exclusion through achieving equity within the education system.” The digital learning environment, in turn, is defined as “a set of modern information and communication technologies and digital educational resources necessary for organizing and implementing the educational process.”

Compared to traditional settings, digital learning environments have the following advantages:

- Independence from time and location;
- Multi-format educational content (text, audio, video, virtual reality);
- Flexibility and personalization of materials;

- Immediate feedback and monitoring of student activity.

This research focuses on the intersection of these two concepts – organizing inclusive education within a digital learning environment.

**Key international practices identified during the study include:**

- **Finland:** Under the "InnoSchool" project, an adaptive digital learning environment was created for students with special needs. The "Finnish National Digital Learning Environment" program provides free and open access to digital learning resources for all students.
- **USA:** The “Universal Design for Learning (UDL)” concept is widely implemented. Under the UDL Guidelines developed by CAST, digital resources are designed to meet diverse student needs. For instance, Bookshare is a digital library offering over 900,000 books for visually impaired students.
- **South Korea:** As part of the “SMART Education” program, platforms such as "Edunet" provide specialized digital content for students with special needs, and the "Digital Textbook" project delivers adaptive learning materials.

Based on the analysis of international practices, the following general principles for effective inclusive education in digital settings were identified:

- Applying universal design for learning (UDL) principles;
- Ensuring flexibility and multi-format content in digital resources;
- Providing access to assistive technologies;
- Regularly training teachers in digital inclusive education methods;
- Engaging parents in the digital learning process.

**Identified pedagogical characteristics of inclusive education in digital environments include:**

- **Individual learning trajectories:** 78% of surveyed teachers stated that digital settings provide opportunities to personalize learning paths.
- **Differentiated learning goals:** Digital tools allow for goal-setting that matches individual abilities.
- **Diverse teaching methods and formats:** These include video lessons, interactive tasks, gamification, project-based learning, etc.
- **Formative assessment:** Platforms enable continuous monitoring and feedback.
- **Collaborative learning:** Tools like virtual groups and forums foster social skills through peer interaction.

**Psychological characteristics include:**

- **Increased motivation:** 82% of parents surveyed noted that digital tools boosted their children's interest in learning.
- **Boosting self-confidence:** Students gain confidence through self-paced learning and positive feedback.
- **Reduced stress:** Digital settings can provide more comfortable learning environments for some students.
- **Social integration:** Digital communication tools can either restrict or expand social interaction.
- **Digital safety and psychological protection:** Ensuring students' well-being in digital environments is critical.

**Recommendations****developed from the study include:**

1. Improving legal frameworks to support inclusive digital education;
2. Creating adaptive digital learning resources in the national language;
3. Training and retraining all educators in digital inclusive methods;
4. Enhancing technical infrastructure, including devices and high-speed internet;
5. Expanding scientific research and applying findings in practice;
6. Strengthening international cooperation and adopting best practices;
7. Developing a monitoring system to assess the effectiveness of inclusive digital education.

**CONCLUSION**

This study identified and analyzed the scientific and methodological characteristics of inclusive education in digital learning environments. The main conclusions are:

- Digital environments offer broad opportunities for organizing inclusive education by enabling flexible, individualized approaches.
- A model based on international best practices for inclusive digital education has been proposed.
- The pedagogical, psychological, and technological features of inclusive digital education were defined and contextualized for implementation in Uzbekistan.
- Scientifically grounded recommendations for developing inclusive digital education in Uzbekistan were developed.

The findings can be applied in developing national programs, preparing educational materials, and organizing teacher training in higher education institutions. The methodology of the study combined theoretical and empirical methods, including literature review, legal analysis, comparative analysis, surveys, interviews, pedagogical observation, statistical analysis, content analysis, and SWOT analysis. The study was conducted in four stages (theoretical-preparatory, empirical, analytical, and final), resulting in a clear identification of the scientific and methodological foundations for organizing inclusive education in a digital learning environment.

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