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PEDAGOGICAL FOUNDATIONS OF TEACHING MATHEMATICS TO PRIMARY SCHOOL STUDENTS REQUIRING INCLUSIVE EDUCATION

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Abstract

This article discusses the pedagogical foundations of teaching mathematics to primary school students requiring inclusive education. It highlights the importance of inclusive education, its role in the primary education system, and analyzes the role of an individual approach in organizing mathematics lessons. The article focuses on developing students' knowledge and competencies through the use of differentiated instruction, visual aids, and game technologies.

Keywords

Inclusive education, concept, law, visual tools, adaptation, Braille alphabet, mathematics.

INTRODUCTION

Education is one of the most vital factors in societal development. It plays a crucial role not only in acquiring scientific knowledge, but also in the spiritual and moral formation of the individual, socialization, and adaptation to life. The sustainable development of any state is primarily determined by the level of development of its education system. Through education, the future generation is educated, and knowledgeable, skilled, and responsible citizens necessary for society are formed. Education is not limited to teaching reading and writing; it is a continuous process that helps every individual develop in all aspects, think independently, and find their place in society. The main goal of education is not only to provide youth with knowledge and skills in science and technology, but also to raise them as useful citizens of society based on social values and moral standards.

The right to education in the Republic of Uzbekistan is guaranteed by the Constitution [1]. Article 50 of the Constitution states: "Everyone has the right to education. The state guarantees the development of the continuous education system, its various types and forms. The state guarantees free secondary education." This article is aimed at ensuring the principle of equality in education and envisages the creation of equal opportunities for children with special educational needs. From this perspective, the concept of inclusive education takes on special significance.

Inclusive education is a form of education aimed at teaching children with disabilities and special educational needs together with their healthy peers in general education institutions. Such an approach serves to form children not as separate entities, but as full-fledged members of society. The primary education stage serves as the foundation for a child's subsequent educational activities. Precisely at this stage, skills such as logical thinking, analysis, comparison, and problem-solving are formed in students through mathematics. In the inclusive education system, the implementation of the following tasks is required:

- creating necessary psychological-pedagogical and corrective conditions for children and adolescents with disabilities in educational institutions, providing mental development and social adaptation through general education curricula and corrective work adapted to their capabilities;
- guaranteeing the right of equal opportunity in education for students;
- satisfying the needs of children with disabilities and healthy children with the active participation of society and family, and adapting them early to social life;
- forming a friendly and loving attitude toward children and adolescents with disabilities in society. Teaching mathematics under inclusive education conditions requires well-planned, individual approach-based methods.

LITERATURE REVIEW

The issue of inclusive education has been widely studied nationally and internationally. UNESCO's "Education for All" program defines inclusive education as an approach aimed at adapting the education system to satisfy the needs of all children. This approach serves to eliminate barriers between children with disabilities and healthy children. In Uzbekistan, several laws and regulatory documents have been adopted to develop inclusive education. In particular, Article 20 of the Law of the Republic of Uzbekistan "On Education" [2] specifies that inclusive education is organized to create equal opportunities for all learners, taking into account the diversity of special educational needs and individual capabilities.

Furthermore, according to Decree No. UP-5712 of the President of the Republic of Uzbekistan dated April 29, 2019, the "Concept for the Development of the Public Education System of the Republic of Uzbekistan until 2030" was implemented. This decree highlights the necessity of developing inclusive education programs in the public education system. The Law "On the Rights of Persons with Disabilities" (October 15, 2021, No. ZRU-707) is aimed at protecting the rights of persons with disabilities, including ensuring their right to education. Resolution No. PQ-4860 of the President of the Republic of Uzbekistan dated October 13, 2020 approved the "Concept for the Development of Inclusive Education in the Public Education System in 2020–2025" [3]. In pedagogical literature, Qodirova and Matupayeva [4] emphasize that teaching mathematics in inclusive classes requires special methodological adaptations.

METHODOLOGY

Teaching all subjects, including mathematics, under inclusive education conditions demands unique complexities because it is necessary to consider the individual needs of each student. Primary mathematics lessons require creating a favorable environment for students with diverse talents and needs. While some children master

mathematical concepts quickly, others may require more practical exercises, visual tools, or a personalized approach. For instance, children with hearing impairments require active use of visual materials, pictures, and diagrams. For visually impaired students, Braille script, audio materials, or specialized software are essential [4]. In this study, qualitative pedagogical analysis, comparative instruction methods, and structured lesson adaptation framework were applied. To ensure continuity in inclusive mathematics lessons, the following methodological components are implemented:

Individual approach: Adapting and distributing mathematical materials based on each student's needs, interests, and capabilities. For example, giving the same topic to all students, but providing more complex tasks or additional instructional materials as appropriate.

Methodological diversity: Using diverse forms such as visual tools, electronic textbooks, game elements, and group projects in lessons. This expands every child's potential and assists in continuous growth.

Step-by-step formation of mathematical concepts: An important aspect of ensuring continuity is the step-by-step formation of mathematical concepts. It is based on the principles of moving from simple to complex, from basic to intricate structures, and from concrete to abstract.

Cooperation and social integration: The principle of cooperation is of great importance in inclusive mathematics lessons. Dividing students into small groups, solving problems together through role-playing games, and having one student explain a difficult problem to another—all these create a favorable social environment for every child.

RESULTS

Teaching mathematics in an inclusive education environment is a complex yet effective process. Each student possesses distinct physical, intellectual, and psychological characteristics. While some students grasp mathematical concepts rapidly, others require more visual aids, practical exercises, or an individual approach [4]. For example, students with hearing impairments benefit significantly from visual materials, diagrams, and charts. For visually impaired learners, audio materials, Braille text, or specialized software should be utilized.

In inclusive mathematics classes, the individual approach holds a key position. While the same topic is delivered to all students, the complexity level of tasks is adjusted according to their capabilities. The learning progress of students is determined through feedback, and additional support is rendered when necessary. Methodological diversity is also a major factor: using visual tools, digital textbooks, game elements, and team/group work enhances student engagement and fosters independent and creative thinking.

DISCUSSION

The results demonstrate that applying differentiated tasks and multi-sensory teaching tools substantially enhances primary students' engagement and comprehension of mathematical operations. Step-by-step concept building ensures learning continuity, allowing students to progress from concrete to abstract concepts

at their own pace. Collaborative learning builds strong social and communicative competencies between special needs students and their peers.

Furthermore, modern formative assessment techniques alongside traditional methods allow for comprehensive monitoring of student progress. The interactive methods allow students with diverse needs to actively participate in class activities without feeling marginalized, thereby fulfilling both educational and socio-pedagogical objectives outlined in national policy frameworks [1, 2, 3].

CONCLUSION

Teaching all subjects, including mathematics, under inclusive education conditions presents certain complexities. Organizing the lesson process while considering each student's physical or mental condition and individual needs requires from the teacher not only professional knowledge and skills, but also patience, care, an individual approach, and creativity. Particularly because mathematics holds an essential place in forming logical thinking, analytical approach, and clear concepts, teaching this subject in inclusive groups must be planned with extra care.

Therefore, using visual tools, modern applications and methods, as well as adapted materials tailored to students' abilities, is of great significance for effectively teaching mathematics in inclusive education. Such an approach not only increases students' interest in the lesson, but also improves their level of knowledge mastery. Creating equal opportunities in inclusive education serves to establish a fair and sustainable educational environment that supports the comprehensive development of every child.

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