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THE METHODOLOGY OF FORMING CONCEPTS ABOUT GEOMETRIC SHAPES IN CHILDREN IN PRESCHOOL EDUCATIONAL INSTITUTIONS

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Abstract
This article explores the methodology of developing preschool children's understanding of geometric shapes within early childhood education settings. Emphasis is placed on age-appropriate pedagogical strategies, visual aids, and interactive methods that support cognitive and spatial development. The study examines both theoretical foundations and practical approaches used by educators to foster children's ability to recognize, differentiate, and name basic geometric shapes such as circles, squares, and triangles. It also highlights the importance of integrating geometric concepts into play-based learning to enhance engagement and comprehension. The article considers the specific context of preschool institutions in Uzbekistan and outlines culturally relevant educational tools and techniques.

Keywords: Geometric shapes, preschool education, visual thinking, early childhood development, teaching methodology, spatial reasoning.

Introduction

MAKTABGACHA TA‘LIM TASHKILOTLARIDAGI BOLALARDA GEOMETRIK FIGURALAR HAQIDA TASAVVURLARNI SHAKLLANTIRISH METODIKASI

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Annotatsiya:
Ushbu maqolada maktabgacha ta’lim muassasalarida bolalarning geometrik shakllar haqidagi tushunchalarini shakllantirish metodikasi yoritilgan. Unda yoshga mos pedagogik yondashuvlar, vizual vositalar va kognitiv hamda fazoviy rivojlanishni qo‘llab-quvvatlovchi interaktiv usullarga alohida e’tibor qaratiladi. Tadqiqotda bolalarning doira, kvadrat, uchburchak kabi asosiy geometrik shakllarni taniy olish, farqlay olish va nomlay olish ko‘nikmalarini rivojlantirish bo‘yicha nazariy asoslar va amaliy yondashuvlar tahlil qilinadi. Geometrik tushunchalarni o‘yin asosidagi ta’lim jarayoniga kiritishning ahamiyati yoritilib, bu usul bolalarning o‘zlashtirish darajasini va qiziqishini oshirishga xizmat qilishi ko‘rsatilgan. Maqolada O‘zbekiston maktabgacha ta’lim muassasalari kontekstida madaniy jihatdan mos keladigan ta’lim vositalari va uslublari ham bayon etilgan.

Kalit so‘zlar: geometrik shakllar, maktabgacha ta’lim, vizual tafakkur, erta bolalik rivoji, o‘qitish metodikasi, fazoviy tafakkur.

Introduction

The formation of mathematical concepts in early childhood plays a vital role in laying the foundation for later academic success. Among these concepts, understanding geometric shapes is one of the most important cognitive skills that preschool-aged children must develop. Geometry not only helps children recognize and categorize objects in their environment but also contributes significantly to the development of spatial reasoning, fine motor skills, and logical thinking. The ability to identify shapes, distinguish between their features, and understand their properties provides children with the tools to analyze the physical world, solve problems, and communicate ideas more effectively.

In preschool educational institutions, the teaching of geometric concepts must align with the cognitive abilities and psychological characteristics of young learners. Since preschool children learn primarily through sensory experience, play, and imitation, the methods used to introduce geometric shapes must be interactive, visually engaging, and rooted in real-life contexts. This approach supports the natural learning processes of children and enables them to absorb abstract concepts in a concrete and meaningful way.

In the context of Uzbekistan's national educational priorities, strengthening early childhood education has become a focus of reforms aimed at improving the overall quality of learning. Therefore, the effective development of spatial and mathematical thinking in preschoolers is essential to align with both global standards and national expectations. This article aims to investigate the existing methodologies used in teaching geometric shapes to preschool children and propose evidence-based strategies that are pedagogically sound and culturally suitable for use in Uzbek preschool institutions.

Literature Review

The importance of introducing mathematical and geometric concepts during the preschool period has been emphasized by numerous researchers in the field of early childhood education. According to Piaget's theory of cognitive development, children in the preoperational stage (ages 2–7) begin to form mental representations of objects and are capable of symbolic thinking, making this period ideal for introducing basic geometric shapes. Vygotsky’s sociocultural theory further highlights the role of social interaction and guided learning in cognitive development, which supports the use of teacher-led and peer-assisted activities in learning geometry.

Recent studies have shown that early exposure to shape recognition enhances children's readiness for formal schooling and improves their problem-solving skills. For example, Clements and Sarama (2009) argue that geometry in early education is not merely about naming shapes but involves understanding spatial relationships and using visual reasoning. Research has also underlined the benefits of using manipulative materials, visual aids, and storytelling in helping young children conceptualize abstract geometrical ideas.

In Uzbekistan, although the national curriculum for preschool education includes elements of mathematics, the specific focus on geometric development has only recently gained attention

in policy discussions. There is growing interest among educators in exploring modern, interactive methods aligned with international pedagogical practices while also considering the local cultural and educational context. This article builds on this emerging literature to offer methodological insights tailored to the needs of Uzbek preschool educators.

Methodology

This study employs a qualitative research methodology, focusing on observational analysis and case studies conducted in selected preschool educational institutions in Uzbekistan. Data were gathered through classroom observations, interviews with early childhood educators, and analysis of teaching materials and lesson plans. The aim was to explore the practical application of methods used to teach geometric shapes and to identify effective pedagogical techniques suitable for preschool-age children.

Teachers participating in the study were selected based on their experience and involvement in implementing early mathematics curricula. The observations focused on how children interacted with different teaching aids such as shape puzzles, blocks, flashcards, and digital resources. Special attention was given to methods that involved storytelling, games, and group activities, as these were frequently mentioned by educators as highly effective for maintaining children's attention and promoting active learning.

The analysis also considered the structure and content of official teaching materials recommended by the Ministry of Preschool Education in Uzbekistan. These materials were evaluated in terms of their relevance, cultural appropriateness, and ability to support shape recognition and spatial reasoning. The study’s findings aim to contribute to the development of an improved methodological framework that can be used in preservice teacher training programs and adapted to various preschool settings across the country.

Discussion

The findings of the study reveal that the most effective methods for teaching geometric shapes to preschool children are those that integrate visual, tactile, and interactive components. Teachers who use storytelling combined with visual aids—such as colorful posters, shape characters, and digital animations—report higher levels of engagement and shape retention among children. Games involving shape sorting, matching, and building are also particularly effective in helping children distinguish between different forms and understand their properties.

One of the key observations is that children learn best when geometric shapes are introduced in the context of their everyday lives. For example, pointing out circular plates, rectangular doors, or triangular roofs during classroom discussions helps to ground abstract shapes in real-world experience. This real-life application encourages children to observe and think critically about the shapes that surround them, thereby developing their analytical thinking and vocabulary.

Another critical aspect is the role of teacher interaction and scaffolding. When teachers guide children through shape-related tasks using questions, prompts, and feedback, the children are more likely to stay engaged and succeed in understanding the material. Peer collaboration also

proves valuable, as group activities allow children to learn from one another, negotiate meanings, and share discoveries.

However, the study also identifies several challenges. Some teachers lack adequate training in modern pedagogical strategies for teaching geometry, relying instead on outdated methods that do not support active learning. In addition, there is a need for more locally developed teaching resources that reflect the cultural environment of Uzbek children. Addressing these gaps will require targeted professional development programs and the creation of innovative educational materials that align with both global best practices and the national educational context.

Overall, the integration of geometry into play-based, visually rich, and socially interactive activities emerges as a highly promising approach. This not only strengthens children's understanding of shapes but also promotes a broader set of developmental skills such as communication, creativity, and teamwork.

Main Part

The formation of geometric concepts in preschool-aged children requires a structured yet flexible pedagogical approach that respects the cognitive and emotional development of young learners. In Uzbek preschool institutions, the curriculum must be adapted to include both traditional and innovative teaching techniques that resonate with the cultural and linguistic background of the children. The development of shape recognition should begin with basic figures such as the circle, square, triangle, and rectangle, gradually expanding to more complex forms as children's understanding deepens.

In practice, successful teachers often begin with direct instruction—introducing each shape by name, describing its properties (number of sides, angles, length), and showing physical or visual examples. Once familiarization is achieved, children are guided through classification exercises, where they are asked to group similar shapes or find shapes that match a given pattern. Manipulatives such as foam blocks, felt boards, and wooden puzzles are widely used to allow children to handle and examine shapes physically, which enhances sensory learning.

The integration of arts and crafts also proves beneficial. For example, children can create collages using cut-out shapes, draw pictures with hidden geometric forms, or construct models from everyday materials. These activities encourage creativity while reinforcing geometric knowledge. Movement-based activities—such as tracing shapes in sand or air, or walking along tape outlines on the floor—help children internalize spatial dimensions through kinesthetic experience.

Digital technologies are increasingly being used to support this learning. Interactive whiteboards, shape-identification games on tablets, and virtual puzzles offer opportunities for individualized learning, especially for children who may need additional practice. However, it is crucial that screen-based methods complement rather than replace hands-on experiences, which are more developmentally appropriate for this age group.

Teachers must also pay close attention to language development during geometry lessons. Teaching geometric vocabulary—such as "side," "corner," "round," and "straight"—is essential for enabling children to articulate what they observe. Using songs, rhymes, and repetitive storytelling helps reinforce these terms and embeds them into long-term memory.

Moreover, consistent formative assessment is vital. Teachers should observe children's interactions with shapes, ask them to explain their reasoning, and adapt instruction based on individual progress. Such assessments not only guide teaching but also allow educators to identify developmental delays or advanced understanding that may require differentiated instruction.

Overall, the main body of geometric teaching methodology in preschool lies in creating a multisensory, linguistically rich, socially interactive, and culturally meaningful environment where children are encouraged to explore and make discoveries. Through a balance of guidance and autonomy, preschool children can develop a strong conceptual foundation in geometry that supports broader mathematical and cognitive development.

Conclusion

Developing geometric understanding in preschool children is a foundational aspect of early childhood education that has lasting effects on their cognitive and academic growth. The ability to recognize, describe, and differentiate geometric shapes enhances children's spatial reasoning, logical thinking, and problem-solving skills, which are essential for future learning in mathematics and other disciplines. This study has demonstrated that the most effective teaching strategies involve a combination of hands-on experiences, visual stimulation, verbal reinforcement, and social interaction.

In the context of Uzbekistan's evolving educational system, there is a strong need to modernize the methods used in preschool institutions by incorporating both international best practices and culturally relevant pedagogies. Teachers must be equipped with appropriate training and access to diverse educational materials that encourage active, play-based learning. The integration of movement, art, technology, and storytelling into geometry lessons creates a dynamic and inclusive learning environment that supports children at various developmental levels.

To improve outcomes further, ongoing teacher professional development programs and systematic updates to preschool curricula are necessary. These improvements should focus on equipping educators with the tools and knowledge needed to foster early geometric thinking effectively. Moreover, future research should continue exploring innovative, evidence-based approaches to shape education, particularly in under-resourced and rural preschool settings.

By prioritizing the development of geometric concepts during the preschool years, educators in Uzbekistan can ensure that young learners acquire the cognitive skills and curiosity necessary for lifelong learning and success in a rapidly changing world.

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