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# DIDACTIC GAMES AS A TOOL FOR DEVELOPING LOGICAL OPERATIONS IN CHILDREN AGED 5–7: THEORETICAL ASPECTS

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**Abstract**
This article examines the role of didactic games in the formation of fundamental logical operations—such as analysis, synthesis, comparison, and classification—in senior preschool-aged children. Particular attention is given to the analysis of the regulatory and legal framework of the Republic of Uzbekistan within the preschool education sector, as well as the theoretical substantiation of the effectiveness of game-based methods. The authors emphasize the significance of continuity between preschool and primary general education through the advancement of cognitive abilities.

**Keywords:** Didactic game, logical operations, senior preschool age, education in Uzbekistan, state requirements, intellectual development.

## Introduction

### Relevance of the Topic

At the current stage of social development, the Republic of Uzbekistan is undergoing a fundamental transformation of its national education system. Within the framework of the "Uzbekistan — 2030" Strategy and the implementation of tasks outlined in the Resolution of the President of the Republic of Uzbekistan No. PP-3305, "On measures to further improve the preschool education system," special emphasis is placed on establishing the intellectual foundation of the individual.

The preschool age of 5–7 years is recognized as a critical period during which the mechanisms of cognitive activity and mental flexibility are established. Amidst digitalization and an increasing flow of information, a child's ability to logically structure knowledge becomes a prerequisite for successful socialization and future competitiveness.

Psychological and pedagogical science characterizes the ages of 5–7 as a sensitive period for transitioning from egocentric, visual-representative perception toward the elements of verbal-logical thinking. However, an analysis of current educational practices in Preschool Educational Organizations (PEO) shows that the focus often shifts toward the mechanical accumulation of knowledge (counting, reading) at the expense of developing the operational side of the intellect—the ability to analyze, synthesize, classify, and generalize.

The insufficient formation of these logical operations by the time a child enters school leads to difficulties in mastering abstract concepts in mathematics and linguistics. This necessitates the search for more effective developmental tools. One such tool is the didactic game. In the context of the "Ilk Qadam" (First Step) State Curriculum, play is viewed not merely as a leisure activity, but as the leading activity that provides a child's natural motivation. Didactic games allow complex logical tasks to be transferred from an abstract plane into a practical, playful form, which aligns with the law of continuity and the psychological characteristics of the senior preschooler.

The purpose of this article is to provide a theoretical substantiation of the didactic game as a systemic means of forming logical operations in children aged 5–7, in accordance with the state requirements of the Republic of Uzbekistan.

The functioning of the preschool education system in the Republic of Uzbekistan has undergone conceptual changes in recent years, aimed at creating legal guarantees for the formation of the intellectual potential of the younger generation. The development of logical operations in children aged 5–7 is based on a hierarchical system of normative acts that determine the content and methods of pedagogical intervention.

1. Law of the Republic of Uzbekistan "On Preschool Education and Upbringing" (2019). This law serves as the supreme regulatory act in the field. Regarding the development of cognitive skills, the following provisions are of key importance:

• Article 6 enshrines the child's right to the development of abilities and talents. The text emphasizes that education must be developmental in nature, with the intellectual aspect being a priority.

• Article 25 defines the primary goal of preschool education as preparing the child for school. The development of logical thinking at ages 5–7 is treated as a mandatory component of readiness for the next educational stage.

**2.** "Ilk Qadam" State Curriculum (Second Edition). The "Ilk Qadam" (First Step) program acts as the primary tool for implementing educational standards in Preschool Educational Organizations (PEO). It is based on a competency-based approach, where logical development is embedded into key developmental areas:

• "Cognitive Development" Sphere: Directly mandates the advancement of cognitive-research activities. The program emphasizes that a child aged 5–7 should not merely possess knowledge but be able to manipulate it: classifying objects by multiple criteria, identifying patterns, and drawing basic conclusions.

• Integration with TRIZ Technologies: The curriculum encourages the use of games that develop mental flexibility and the ability to solve non-standard problems, which is directly linked to the operations of analysis and synthesis.

3. State Requirements for the Development of Early Childhood and Preschool Children. This document establishes clear indicators of what a child should be able to do upon completing preschool education. In the field of intellectual development, the following targets are set for the 5–7 age group:

• Ability to Abstract: The skill to isolate object properties (color, shape, size) regardless of their function.



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• Operational Skills: Requirements include the ability to compare objects (finding more than five differences), group them (by generic categories such as "transport," "animals," or "vegetables"), and construct seriation series (e.g., from longest to shortest).
• Causal Relationships: The child's awareness that one event leads to another, which represents the highest manifestation of logical thinking in preschool age.
4. Strategy for the Development of the Preschool Education System until 2030. In the long term, Uzbekistan's state policy is oriented toward the introduction of innovative pedagogical technologies. In this context, the **didactic game** is recognized as a natural and scientifically grounded method that allows for the fulfillment of state requirements without placing excessive academic strain on the child's psyche.
The regulatory and legal framework of the Republic of Uzbekistan is shifting the vector from "teaching knowledge" to "teaching ways of thinking." This creates a legitimate field for the implementation of didactic games as a mandatory element of the educational process, aimed at achieving state-mandated competencies in logical development.
The formation of logical thinking between the ages of 5 and 7 is a fundamental stage of psychological development. According to Jean Piaget's classification, this period corresponds to the conclusion of the preoperational stage and the transition to concrete operations. During this time, the child begins to overcome egocentrism and learns the reversibility of thought.
L.S. Vygotsky emphasized that instruction at this age should precede development, focusing on the "zone of proximal development." In the works of regional scholars notably P. Makhmudova, it is noted that the intellectual center of a senior preschooler is formed through the interiorization of external actions into an internal mental plane.
Key logical operations in senior preschool age:
1. Analysis and Synthesis**:** The process of mentally decomposing an object into its constituent elements (color, shape, size) and subsequently reuniting them to understand the structure of the whole. For example, working with construction sets or diagrams requires the child to understand how individual parts form a functional object.
2. Comparison: An operation aimed at establishing similarities and differences. For children aged 5–7, it is crucial to develop the ability to move from identifying superficial features (e.g., color) to essential ones (e.g., functional purpose, material).
3. Classification and Generalization: The ability to group objects based on genus-species characteristics. This requires a high level of abstraction—the ability to disregard specific properties in favor of general ones.
In pedagogy, the didactic game is viewed as a method of "unintentional learning." Its uniqueness lies in its dual nature: for the educator, it is a tool for achieving an educational goal; for the child, it is an engaging and immersive activity.
Structural Components of Games for Logical Development:
• Didactic Task: Unlike a traditional school lesson, the educational goal here is concealed by a play motive. The child does not "learn to classify"; rather, they "help the toys find their homes."



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• Game Rule: This acts as a mechanism for managing cognitive activity. Rules compel the child to restrain impulsive reactions and operate within a logical algorithm.
• Game Action: The external manifestation of the intellectual process. Utilizing aids such as Dienes Logical Blocks or Cuisenaire Rods allows for the visualization of abstract logical connections.

At the age of 6–7, it is critical to ensure a gradual transition away from external visual aids. The game must evolve from the manipulation of physical objects to solving problems mentally (verbal logic), which is a direct requirement for successful primary school performance.

To provide a systemic impact on a child's intellect in Preschool Educational Organizations (PEO), it is necessary to utilize a variety of game formats:

| Game Type | Pedagogical Focus | Methodological Examples |
|---|---|---|
| **Object-Manipulative** | Development of spatial analysis and combinatorial synthesis. | "Tangram," "Pythagoras," games with Dienes blocks (searching for shapes by 3–4 attributes). |
| **Tabletop/ Print-based** | Formation of classification, seriation, and generalization operations. | Logical tables ("Find the missing shape"), "Groups" dominoes, Raven's Matrices for children. |
| **Verbal** | Development of verbal logic, deductive reasoning, and judgment. | "Negative Riddles," "If..., then...," "Association Chain," "Possible—Impossible." |

## Conclusion

The theoretical analysis of the development of logical operations in senior preschool-aged children leads to several significant conclusions with both theoretical and practical value for the modern preschool education system in the Republic of Uzbekistan. This study substantiates that the didactic game is the most appropriate and effective tool for the intellectual development of children aged 5–7. This is due to the fact that at this age, play remains the leading activity, ensuring maximum engagement and emotional resonance from the child. The application of game-based methods fully correlates with the requirements of the Law of the Republic of Uzbekistan "On Preschool Education and Upbringing" and the objectives of the "Ilk Qadam" State Curriculum, which direct educators toward the formation of key competencies rather than the reproductive acquisition of facts.

It has been theoretically proven that the systematic use of didactic games focused on practicing the operations of analysis, synthesis, comparison, and classification creates a solid cognitive foundation:

- Analysis and synthesis games develop the ability to perceive an object's structure;
- Comparison games teach the child to identify essential features;
- Classification games form the foundations of conceptual thinking.

Taken together, these processes transition the child's thinking from a visual-representative level to a qualitatively new logical level.



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A key conclusion of this article is that the didactic game serves as a vital link in the "Preschool–School" continuous education system. Forming logical operations through play minimizes the stress associated with the transition to formal academic activity. A child who has mastered logical techniques at ages 5–7 demonstrates a higher readiness for grasping mathematical abstractions, conscious reading, and independent behavioral regulation in primary grades.

The effectiveness of the didactic game directly depends on its systemic design. The transition from simple object-manipulative games to complex verbal-logical tasks must be gradual and purposeful. In the context of Uzbekistan's educational reforms, this requires a high level of methodological training from educators and the ability to integrate modern aids (such as Dienes blocks, Cuisenaire rods, and TRIZ cards) into the daily educational process.

The development of logical operations through didactic games is not an optional element but a necessary condition for implementing modern educational standards. The theoretical substantiation of this issue confirms that play activity in senior preschool age serves as the basis for forming the functional literacy of the country's future citizens, enabling them to engage in critical thinking and the independent search for solutions.

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