
CONFERENCE ARTICLE**PEDAGOGICAL OPPORTUNITIES FOR DEVELOPING LOGICAL THINKING IN PRESCHOOL CHILDREN BASED ON MONTESSORI PEDAGOGY****Dosbaeva Shaxnoza Abdurahimovna**Teacher at Namangan State University, Uzbekistan

ABSTRACT

This thesis examines the pedagogical opportunities of developing logical thinking in preschool children through Montessori pedagogy. Logical thinking in preschool age is formed through observation, comparison, classification, sequencing, establishing cause-and-effect relationships and independent problem solving. Montessori pedagogy offers a specially prepared environment in which children learn through sensory experience, purposeful activity, freedom within limits and self-correction. The purpose of this thesis is to analyze how Montessori materials and pedagogical principles support the development of logical thinking in preschool education. The study is based on theoretical analysis of Montessori pedagogy, early childhood education and cognitive development approaches. The results show that Montessori-based learning creates favorable conditions for children's intellectual independence, concentration, analytical perception and gradual transition from concrete actions to abstract reasoning.

KEYWORDS

Montessori pedagogy, preschool education, logical thinking, cognitive development, prepared environment, didactic materials, independence, sensory education.

INTRODUCTION

Preschool age is an important period for the formation of basic intellectual abilities. During this stage, children actively perceive the surrounding world, compare objects, identify similarities and differences, understand simple relationships and gradually acquire the ability to make elementary conclusions. Logical thinking does not appear automatically; it develops through properly organized educational activities, rich sensory experience and meaningful interaction with the environment. Therefore, preschool education should create conditions in which children can think independently, choose actions consciously and solve practical tasks.

Montessori pedagogy is one of the effective approaches for developing children's logical thinking because it is based on the child's natural activity, independence and self-development. In Montessori education, the child does not simply receive ready-made knowledge from the teacher, but discovers relationships between objects through personal experience. This approach is especially valuable for preschool children, whose thinking is closely connected with concrete actions and visual perception. Montessori materials help children move from simple sensory distinctions to more complex mental operations such as classification, ordering, comparison and generalization.

The relevance of this topic is determined by the need to improve preschool education methods aimed at developing children's intellectual readiness for school. Logical thinking is necessary not only for mathematics, but also for speech development, environmental awareness, communication and everyday decision-making. For this reason, studying the pedagogical opportunities of Montessori pedagogy in this direction has theoretical and practical importance.

The thesis is based on theoretical and methodological analysis of scientific literature on Montessori pedagogy, preschool education and cognitive development. The works of M.

Montessori, E. M. Standing, A. S. Lillard and researchers in child development were used as the conceptual basis. The methodological approach included analysis, comparison, generalization and pedagogical interpretation.

The object of the study is the process of developing logical thinking in preschool children. The subject of the study is the pedagogical opportunities of Montessori pedagogy in organizing this process. Special attention is given to the prepared environment, didactic materials, sensory education, independent activity and the role of the teacher as an observer and guide. The study does not present experimental statistical data, but it develops a theoretical framework that can be applied in preschool educational practice.

The analysis shows that Montessori pedagogy develops logical thinking in preschool children through several interconnected pedagogical mechanisms. The first important mechanism is the prepared environment. In Montessori classrooms, materials are arranged according to order, accessibility and developmental sequence. This order helps children understand relationships between objects and actions. When a child chooses a material, uses it according to a certain sequence and returns it to its place, the child gradually learns organization, consistency and responsibility. These qualities are closely connected with logical thinking.

The second mechanism is sensory education. Montessori materials such as the pink tower, brown stairs, cylinder blocks, color tablets and geometric solids help children compare size, shape, color, volume and proportion. Through direct manipulation of these materials, children learn to distinguish essential features of objects. For example, when a child arranges objects from large to small or matches shapes to their places, the child performs logical operations in a concrete form. Such activities prepare the basis for later abstract thinking.

The third mechanism is self-correction. Many Montessori materials are designed so that children can notice their own mistakes without direct adult intervention. This feature is pedagogically significant because it develops independent analysis and self-control. When a child sees that one cylinder does not fit into the correct hole or one element remains outside the sequence, the child searches for the reason and corrects the action. This process forms elementary problem-solving skills and encourages logical reflection.

The fourth mechanism is freedom within limits. Montessori pedagogy gives children the opportunity to choose activities, but this freedom is organized within clear rules. The child chooses a task, concentrates on it, completes it and then moves to another activity. Such independence develops purposeful behavior and decision-making. Logical thinking is strengthened because the child learns to plan actions, compare alternatives and evaluate results.

The fifth mechanism is the gradual transition from concrete to abstract. In preschool age, children understand concepts better when they are connected with physical objects. Montessori materials make abstract ideas visible and tangible. Quantity, size, sequence, symmetry, classification and spatial relations are first experienced through hands-on activity and later expressed through speech and thought. This transition is essential for the development of logical reasoning.

Montessori pedagogy provides rich opportunities for developing logical thinking, but its effectiveness depends on proper pedagogical organization. The teacher should not dominate the child's activity, but should observe, guide and create conditions for independent discovery. If the teacher explains too much or corrects every mistake immediately, the child's opportunity for independent reasoning decreases. Therefore, the Montessori teacher's role is to present the material clearly, observe the child's activity and intervene only when necessary.

Another important condition is the purposeful selection of materials. Materials should correspond to the child's age, interests and level of development. Tasks that are too easy do not stimulate thinking, while tasks that are too difficult may cause confusion. The teacher should provide gradual complexity so that children can move from simple comparison to classification, sequencing and problem solving. In this process, speech also plays an important role. Children should be encouraged to name objects, describe actions, explain differences and express conclusions. This connection between action and speech strengthens logical thinking.

Montessori pedagogy is also valuable because it supports concentration and perseverance. Logical thinking requires the ability to focus on a task, identify a problem and search for a solution. Montessori activities, especially practical life and sensory materials, develop attention and patience. As a result, children become more confident in independent intellectual activity.

Montessori pedagogy offers significant pedagogical opportunities for developing logical thinking in preschool children. Its effectiveness is based on the prepared environment, sensory materials, self-correction, independence and the gradual movement from concrete experience to abstract reasoning. Through Montessori activities, children learn to compare, classify, arrange, observe, analyze and solve simple problems. These skills form the foundation for school readiness and further intellectual development.

The development of logical thinking in preschool education should be organized through active, meaningful and child-centered methods. Montessori pedagogy meets these requirements because it respects the child's natural development and creates conditions for independent discovery. Therefore, the use of Montessori principles and materials can be considered an effective methodological direction for improving preschool education.

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