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Development of Logical Thinking in Preschool Age Children through Quantitative Tasks

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Abstract:

The article analyzes how preschool children can use quantitative tasks to build their logical thinking abilities. Early cognitive development needs logical reasoning since it helps children both identify patterns and understand causal connections followed by independent conclusion making. The research investigates the pedagogical together with psychological principles regarding how quantifier language elements assist students in problem-solving and skill development. The examined research shows interactive teaching methods using didactic games together with structured play that promotes logical learning activities for children. Dienesh geometric blocks serve educational purposes because they support students in developing analytical and abstract thinking capabilities. A planned organizational method for logical exercises leads to development of cognitive skills with maintained student interest. The research establishes that intellectual growth of children depends heavily upon using structured learning strategies which develop their reasoning abilities and skills for problem solving. Preschool educators should apply these methods because they create a solid intellectual base which prepares students for academic success in the coming years. Logic emerges from early age training and educational practice so practitioners need to initiate sustained awareness programs to support children's intellectual development.

Keywords: Pre-school education, logical thinking, quantitative tasks, pedagogical technologies, analytical thinking, educational methodology, development of logical thinking, didactic games, interactive approach.

Introduction: In accordance with the Decree of the President of the Republic of Uzbekistan Shavkat Miromonovich Mirziyoyev "On measures to radically improve the management of the preschool education system" dated September 30, 2017 and the Resolution "On the organization of the activities of the Ministry of Preschool Education of the Republic of Uzbekistan", a new system has been created in this area. This system is tasked with expanding the state and non-state network of preschool education and strengthening its material and technical base, providing them with personnel with sufficient experience and qualifications, dramatically increasing the process of covering all children in preschool education, and radically improving the quality of their preparation for school education through the use of advanced technologies in the educational process.

The importance of logical thinking growth in early childhood education requires more emphasis after the current introduction. Problems, decisions and analysis rest upon logical reasoning skills since these abilities lead to success in academic studies and life after graduation. Studies demonstrate how the early development period of a child's life fundamentally determines cognitive ability so preschool education stands as a critical time to grow logical thinking abilities. Since brain development happens swiftly in this period children process numerous facts and establish neural links that affect their critical thinking capabilities. A high-quality preschool curriculum needs to implement organized educational approaches which systematically teach logical reasoning skills to children.

Play-based learning stands as an optimum method to develop logical thinking abilities in preschool children because it provides enjoyable opportunities for mental challenges. Children use educational games combined with puzzles so they can learn pattern recognition along with sorting tasks and understanding deep causal connections. Such activities simultaneously trigger intellectual interest while enhancing group work with social aspects. The educational mission of teachers involves establishing learning spaces where kids can explore while developing their own independent thoughts. Teachers prepare children to develop critical thinking abilities through storytelling sessions and interactive questions and hands-on projects which also preserve student engagement and motivation.

Modern technological integration has enabled new possibilities for logical thinking development in preschool-aged children because of alternative teaching approaches. Educational apps together with interactive software tools offer digital platforms which make logical reasoning practice accessible for kids through interesting interfaces. The adaptive learning system of these resources adjusts to individual learners' progress which allows them to achieve personalized intellectual growth. Children learn better through augmented reality (AR) and virtual reality (VR) systems because these technologies place them inside problem-solving challenges that require them to solve logical hurdles. The advantages of digital tools should be applied wisely because a combination of virtual learning and sensorial hands-on education creates complete cognitive development for students.

For the development of logical thinking both parents and caregivers need to play an active role. A child's home environment plays a major role in cognitive development so parents can develop logical reasoning skills through normal daily activities. Activities that require children to sort items in the home while looking at story sequences along with explaining their understanding will strengthen their logical understanding. When children do problem-solving activities with others they solve or play strategic puzzles and board games it helps their thoughts evolve toward critical and informed decision-making abilities. Experienced partnership work between school staff and parents helps maintain solid reinforcement of logical thinking skills which gives preschool students an important foundation for future academic success.

Children need to develop logical thinking skills because education and interactive play combined with technology and parental support can achieve this early on. Through educational settings that

promote cognitive engagement preschool education delivers the needed skills which help students solve complex academic and personal problems.

Methodology: A quantifier is a logical operation that provides a quantitative description of the subject area, and V. E. Plisko said about the quantifier: A quantifier is the general name for logical operations that limit the truth range of any predicate. In mathematical logic, the universality quantifier and the existence quantifier are most often used. (V. P. Plisko)

The earlier one engages in the education and upbringing of preschool children, the earlier its effect will be manifested, which will have a positive effect on the child's life. Therefore, the development of a child's logical thinking has become one of the main tasks.

Imagination is the development of primary logical thinking of thinking. Classes held in preschool educational organizations are aimed at visualizing in the minds of children the form of objects and information about phenomena.

Logic is the morality of thought and speech - Yan Lukasievich.

At the current stage of modernization of preschool education, special attention is paid to ensuring the quality of preschool education, which requires the search for ways and means of developing the logical technique of mental movement, taking into account the needs and interests of preschool children. In this case, Dienesh's geometric blocks are educational material that fully meets these requirements. Dienesh blocks help the child master mental operations and movements that are important both from the point of view of pre-mathematical preparation and from the point of view of general intellectual development. The development of children's thinking occurs in an interesting situation for him - when solving problems of a playful nature, in outdoor activities, which helps to alternate the mental load with motor activity. The selection of games and exercises makes it possible to organize a lesson taking into account the individual characteristics of children. Even in one game, tasks can be different - some children work with only one feature, while others already master an exercise where it is necessary to focus on 2-3 features at once. Currently, the question of acceptable and effective forms of teaching children that allow solving the problem of forming elements of logical thinking and elementary mathematical concepts in preschool children remains open. The solution to these conflicts is carried out by searching for new methods and forms of organizing the process of educating children in preschool educational institutions, as well as using the possibilities of educational games and author's manuals when working with children in FEMP.

Results and discussion

Interesting educational and logical games arouse interest in solving mental problems in preschool children: the successful result of mental effort and overcoming difficulties gives them satisfaction and a desire to learn new things. It is necessary to develop a systematic plan for the introduction of various educational games with mathematical content in the pedagogical practice of a modern preschool educational organization. The constantly increasing difficulty of games, the flexibility and variability of their use, the unification and complexity of the same game, based on the principle of step-by-step implementation of educational games, reveal the role of the educator at each stage.

At the same time, it is necessary to take into account another thing: the main support of preschool children is their memory. They remember quickly and a lot, when they get acquainted with something new, they try to connect it with what they already know. Therefore, all the explanations are based on the existing, childhood experience. As mentioned above, since a 5-7-year-old child is just learning to build logical chains, he needs alternative ways to find the missing properties of objects. Imagination helps him in this.

Logic is not an innate property of the human psyche. Gradually, he learns to establish connections, observe patterns, evaluate and draw conclusions. It is the task of parents and teachers to create

favorable conditions for this. This age is optimal for the transition from visual-figurative thinking to logical thinking. However, it should be taken into account that the main form of activity of preschool children is the game. This is not free time, but the basis for acquiring knowledge and skills.

Performing logical tasks in the form of a game leads to good results and attracts children. Its motivation is internal, not external, which is important for continuous intellectual development.

Let's start with the selection of problems based on logic with an analysis:

The zone of proximal development of the baby;

His interests;

The level of memory, oral and written speech;

Environments in which logical games can be played.

It is advisable to provide more educational tools in the form of special games, manuals and tasks. Through logical games, you can switch children's attention and maintain their interest. If parents and educators take the first steps in this direction, the child will learn without experiencing difficulties in performing simple logical operations. The simplest of them are comparing objects and events.

More often, children are presented with tasks such as Find the largest or smallest, Divide into groups, etc., which makes it more difficult for children to find common features in tasks.

Games and tasks to develop abilities should gradually become more difficult. It is important that children can complete the task, but it should not be too easy. Otherwise, interest will be lost and motivation will disappear. Underdevelopment of thinking is an urgent problem of our time. This leads to many negative consequences. The lack of development of logical thinking skills leads to the inability of an adult to:

Think systematically;

Establish cause-and-effect relationships;

Resist manipulation;

Inability to draw correct conclusions;

Reject false statements;

Therefore, performing exercises that develop logical thinking is an effective method of mental development. This is an investment in the future of children, the child will be able to express his thoughts in a new environment, to get out of his shell under any circumstances. Regular mental exercises are a useful habit, because children need to form immunity to neural connections in new mental activities throughout their lives.

The role of MTT in the comprehensive development of children is of great importance. As mentioned above, during this period, children's physical, mental, and psychological health is formed and their mental development abilities are improved. Parents who want their child to be successful, intelligent, and talented in the future should pay attention to his development from this period.

The following ways can be used to develop children's creative thinking and logical thinking.

Reading books: Analyzing and reading book illustrations with the child, explaining the content to the child through games, and explaining the content of the toys the child plays with will lead to good results.

Drawing: children usually love to draw. However, if they cannot do it, they may get upset and stop drawing. Try offering the child to draw with their hands instead of a pencil. A child who dips his hands in paint and draws what he wants will have great fun. Or use a drawing lesson. In this case, you give the child something to draw without finishing it. And the child must finish it himself. For example, if a child is given a circle and we ask him to finish this circle, he will think of what can be drawn inside the circle.

Graphic dictation: In this, the educator tells the children about geometric shapes and objects. For example, a triangle, a bird, etc. Children aged 3-4 distinguish the connections between objects and plan their activities. This activity gradually turns into a creative activity.

Coloring processes Some children are not good at drawing, but they want to draw pictures. Such children can be given the task of coloring ready-made pictures. While coloring pictures, they get acquainted with the heroes of fairy tales. They have ideas about their clothes, appearance, and environment. At the same time, they also develop fine motor skills and creative thinking.

Conclusion

In conclusion, the development of logical thinking skills in preschool children is of great importance for their future intellectual growth and successful adaptation to the educational process. Studies show that quantitative tasks are an effective tool for deepening children's thinking, forming the skills of logical reasoning and drawing important conclusions.

Through quantitative tasks, children form an understanding of the generality and properties of objects, understand the difference between important and secondary signs, and also learn to independently analyze mathematical and logical relationships. Therefore, teachers in preschool educational institutions should widely introduce this methodology and develop children's thinking skills through interactive activities.

In general, quantitative tasks can be considered an innovative approach to developing the logical thinking of preschool children. This will create the basis for their future achievement in the educational process.

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