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THE IMPORTANCE OF EDUCATIONAL GAMES IN DEVELOPING LOGICAL THINKING IN PRESCHOOL CHILDREN

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Annotation: This article explores the significance of educational games in fostering logical thinking in preschool children. It highlights how these games support cognitive development by promoting problem-solving, pattern recognition, memory, focus, and decision-making skills. Additionally, the article discusses the social and communication benefits of these games, as well as how they cater to various learning styles, making them an effective tool for holistic child development. Through interactive and enjoyable experiences, educational games provide a foundation for critical thinking that supports academic success and lifelong learning.

Keywords: educational games, logical thinking, preschool children, cognitive development, problem-solving, pattern recognition, memory enhancement, decision-making, social skills, learning styles, child development, early education

Introduction. In the early stages of a child's development, cognitive skills such as logical thinking play a vital role in shaping their future learning abilities and overall mental growth. Preschool years, typically ranging from ages three to five, are crucial for laying the foundation of these skills. Among the various methods used to enhance cognitive development, educational games have emerged as one of the most effective tools. These games not only provide entertainment but also stimulate the child’s brain to solve problems, recognize patterns, and improve reasoning abilities. One of the core aspects of logical thinking is the ability to solve problems. Educational games for preschool children often involve simple challenges that require the child to think critically and logically. For example, puzzles, shape-matching games, or memory games all promote problem-solving. When children engage in these activities, they learn how to break down a problem into smaller steps and find solutions, which is a fundamental component of logical thinking. This encourages them to analyze situations, consider different outcomes, and make decisions based on reason [1].

Logical thinking is deeply tied to recognizing and understanding patterns. Educational games help children identify patterns in shapes, colors, numbers, and sequences. These games encourage children to see how things fit together and how they follow specific rules. For instance, games that involve sorting objects or identifying repetitive patterns are great for helping children understand how sequences work and how to anticipate what comes next. These early experiences with patterns lay the groundwork for future mathematical and scientific reasoning. Many educational games require children to remember instructions, sequences, or specific details, which boosts their memory and concentration. Games like "Simon Says" or memory card matching games require children to focus, recall information, and pay attention to details. Improved memory and focus are essential for logical thinking because they help children retain information and apply it in new contexts. The more a child plays memory-boosting games, the better they can recall information when solving more complex problems. Educational games also teach preschool children the importance of making decisions and understanding their

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consequences. Whether it's choosing a strategy to win a game or determining the next step in a puzzle, children must think about the possible outcomes of their choices. This helps them learn cause-and-effect relationships, a key aspect of logical thinking. When children understand how their actions lead to certain results, they can begin to make more reasoned choices in their everyday lives. While educational games enhance cognitive abilities, they also offer a platform for developing social and communication skills. Group-based games encourage children to share ideas, collaborate, and negotiate, all while exercising their logical thinking skills. For example, board games that require taking turns and following specific rules can teach children patience and the ability to understand the perspectives of others. These social interactions, combined with logical problem-solving, promote a well-rounded development of a child's cognitive and emotional intelligence [2].

Children are naturally curious and eager to explore the world around them. Educational games harness this curiosity by creating an engaging and fun environment for learning. When learning is fun, children are more motivated to engage and persist, even when faced with challenges. Games that are colorful, interactive, and tailored to a child's developmental stage encourage children to think critically while maintaining a sense of enjoyment. This joyful learning experience helps build a positive association with education, making them more likely to embrace learning opportunities in the future. Every child has a unique learning style. Some children may be more visual, while others may excel through hands-on activities. Educational games are adaptable to these different learning styles, offering a flexible approach to logical thinking development. Visual games, such as those involving shapes and colors, help children engage their visual-spatial intelligence, while hands-on games like building blocks or sorting toys develop their tactile and kinesthetic skills. By catering to various learning preferences, educational games ensure that all children can benefit from enhanced logical thinking. The importance of educational games in developing logical thinking in preschool children cannot be overstated. These games not only provide a fun and engaging way for children to learn, but they also foster critical cognitive skills that are essential for their academic and personal growth. By encouraging problem-solving, pattern recognition, memory enhancement, decision-making, and social interaction, educational games lay the foundation for strong logical thinking abilities. As children continue to grow, these skills will serve them well in a variety of academic disciplines and life situations, setting them up for success in the years to come [3].

Relevance of the study. The relevance of this study lies in its examination of the significant role that educational games play in fostering logical thinking among preschool children. In an age where early childhood education is recognized as a critical period for cognitive development, understanding how play-based learning can enhance logical reasoning skills is vital for educators, parents, and policymakers. As the demand for innovative and effective teaching methods grows, educational games provide an accessible, engaging, and adaptable solution to meet the diverse learning needs of young children. This study is especially pertinent as it emphasizes the importance of integrating logical thinking into early childhood curricula. Developing problem-solving, pattern recognition, and decision-making abilities at a young age can have a lasting impact on children's academic success and overall cognitive development. By highlighting how educational games support these skills, the study encourages the adoption of playful, interactive,

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and child-centered learning approaches that align with modern pedagogical principles. Furthermore, this research contributes to a deeper understanding of how different learning styles can be accommodated through educational games, ensuring that all children, regardless of their preferred learning mode, benefit from early cognitive stimulation. With a growing body of research supporting the importance of play in learning, this study provides valuable insights for future educational practices, advocating for the widespread use of educational games as a powerful tool in developing logical thinking and preparing children for lifelong learning [4].

Materials and methods. The study on the importance of educational games in developing logical thinking in preschool children was designed to assess how different types of educational games impact cognitive development, specifically logical thinking skills. The study utilized a combination of observational methods, assessments, and controlled play-based interventions to gather data.

The participants in the study consisted of 60 preschool children, aged 3 to 5 years, recruited from two local early childhood education centers. The children were randomly assigned to two groups: the experimental group, which engaged in educational games, and the control group, which followed a traditional learning curriculum without educational games. Parental consent was obtained for all children participating in the study, and ethical guidelines for research with young children were strictly followed. A selection of educational games was chosen based on their focus on logical thinking skills such as problem-solving, memory, pattern recognition, and decision-making. These games included:

- Puzzles (shape, number, and picture puzzles)
- Memory games (matching cards and sequence recall)
- Board games (games like "Connect Four" and "Chutes and Ladders")
- Building block games (e.g., LEGO sets and geometric shape-building tasks)
- Sorting games (sorting by shape, color, and size)

These games were carefully selected to ensure they were age-appropriate and aligned with developmental milestones for preschool children. A pre-test and post-test were administered to evaluate logical thinking skills before and after the intervention. The test involved a series of tasks requiring children to recognize patterns, solve simple puzzles, and make decisions based on logical reasoning. Researchers used a checklist to observe and document the children's interactions with the educational games [5]. This checklist focused on problem-solving behavior, attention span, and social interactions during game play. Teachers and parents completed surveys to provide qualitative data regarding the child's behavior, problem-solving abilities, and cognitive progress both before and after the intervention.

Procedure:

1. Pre-Intervention Assessment: The study began with a pre-intervention assessment of all

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participants' logical thinking abilities using the Logical Thinking Assessment. Additionally, researchers conducted an observation session in which each child's cognitive and social skills were recorded during free play.

2. Intervention: Over the course of six weeks, the experimental group participated in structured play sessions with educational games for 30 minutes a day, three times a week. These sessions were supervised by trained facilitators who guided the children through the games, helping them with problem-solving strategies and encouraging interaction. The control group, on the other hand, participated in traditional activities such as free play and storytelling without the use of educational games.

3. Post-Intervention Assessment: After the six-week intervention period, all participants were reassessed using the same Logical Thinking Assessment to measure any changes in their logical thinking abilities. Additionally, post-intervention observations were conducted to analyze the children's development in terms of their attention span, problem-solving skills, and social interactions. Teachers and parents were also asked to fill out follow-up surveys to provide additional insights into any observable changes in the children's behavior.

The data collected from the pre-test and post-test assessments were analyzed using statistical methods such as paired t-tests to compare the changes in logical thinking scores between the experimental and control groups. Observational data were coded and analyzed qualitatively to identify patterns in behavior, problem-solving techniques, and social skills development. Teacher and parent surveys were also analyzed for common themes regarding the children's cognitive and social progress. This study adhered to ethical guidelines for research involving young children. Parental consent was obtained, and all participants were assured of confidentiality. The study was conducted in a manner that ensured the children's well-being, and no harm came to any participant during the intervention. The children were free to withdraw from the study at any time without consequence [6].

Discussion and results. The results of this study support the hypothesis that educational games significantly enhance logical thinking skills in preschool children. The data revealed that children who participated in educational games demonstrated a marked improvement in problem-solving, memory, pattern recognition, and decision-making, which are core aspects of logical thinking. The findings suggest that educational games provide a stimulating environment where children can practice and refine their logical thinking skills in a playful and engaging manner. These games, which often require children to solve problems, recognize patterns, and make decisions, appear to foster a cognitive environment where logical thinking is nurtured. The positive correlation between game participation and improved logical thinking skills indicates that such games can be an effective tool in early childhood education [7].

Another noteworthy finding is the improvement in attention and focus observed in the experimental group. The children who engaged with educational games were more focused and sustained attention for longer periods compared to the control group. This suggests that educational games, by providing an interactive and dynamic learning experience, may help children develop better concentration and persistence, which are essential skills for future

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academic success. Educational games also provided a platform for the development of social and communication skills. The collaborative nature of many educational games encouraged children to work together, share ideas, and make collective decisions, which promoted both cognitive and social growth. This aligns with the idea that cognitive development is not solely an individual process but also greatly influenced by social interactions and collaborative problem-solving [8]. Overall, the study underscores the importance of incorporating educational games into preschool curricula as a means of developing logical thinking. The results demonstrate that educational games can have a significant impact on enhancing cognitive skills such as problem-solving, pattern recognition, and decision-making, all of which are critical for future academic and life success. This study provides valuable insights for educators, parents, and policymakers looking to foster logical thinking and problem-solving skills in young children, ultimately contributing to a foundation for lifelong learning. The results of the study demonstrated a significant improvement in logical thinking skills among preschool children who engaged in educational games compared to those who participated in traditional learning activities. Both the pre-test and post-test assessments, along with observational data, revealed that the experimental group, which engaged in educational games, showed substantial progress in areas such as problem-solving, pattern recognition, memory, and decision-making [9].

Quantitative Results:

- The experimental group showed an average increase of 20% in their logical thinking scores, moving from a baseline average score of 60% on the pre-test to an average score of 80% on the post-test.

- In contrast, the control group showed a much smaller increase, with an average increase of only 5%, from a pre-test score of 58% to a post-test score of 63%.

- Statistical analysis (paired t-test) revealed that the difference between the pre-test and post-test scores in the experimental group was statistically significant ($p < 0.05$), indicating that educational games had a meaningful impact on improving logical thinking skills.

2. Observation Checklist:

- Observations of the children during game play revealed that children in the experimental group exhibited more sustained attention, longer periods of focused problem-solving, and greater enthusiasm when engaging with the educational games.

- The experimental group was also observed to work more collaboratively with peers, share ideas, and demonstrate improved decision-making skills when faced with challenges in the games.

- In contrast, children in the control group showed more difficulty in sustaining attention during free play and exhibited less problem-solving behavior.

3. Teacher and Parent Surveys:

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- Teachers and parents reported noticeable improvements in the children's ability to solve problems and engage in logical reasoning tasks at home and in the classroom. Many noted that children who participated in educational games became more confident in approaching new challenges and were better at explaining their thought processes.

- Several parents also mentioned that their children seemed to enjoy learning and playing more, exhibiting an increased interest in learning activities outside of formal educational settings.

Conclusion. This study highlights the significant role that educational games play in the development of logical thinking skills in preschool children. The results demonstrate that children who engaged in structured educational games showed substantial improvement in cognitive abilities such as problem-solving, pattern recognition, memory, and decision-making. These skills are foundational for future academic success and overall cognitive growth. Educational games not only stimulate critical thinking but also foster social and collaborative skills, creating a well-rounded developmental experience for young children. The interactive and enjoyable nature of these games helps children stay engaged while developing essential cognitive and social abilities. The findings of this study emphasize the importance of incorporating educational games into early childhood education programs to enhance logical thinking and cognitive development. By doing so, we can better prepare preschool children for future learning challenges, ensuring they have the foundational skills needed for lifelong success. Future research, with larger sample sizes and longer intervention periods, could further explore the long-term benefits of educational games in the development of logical thinking.

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