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DEVELOPING LOGICAL THINKING IN PRIMARY SCHOOL STUDENTS THROUGH GAME TECHNOLOGIES

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Annotation. This article explores the pedagogical effectiveness of utilizing game technologies to develop logical thinking in primary school students. The transition from preschool to primary education requires a shift from play-based activities to formal academic learning; however, play remains a fundamental psychological need for young children. By strategically integrating didactic games, interactive puzzles, and role-playing activities into the educational process, teachers can stimulate students' cognitive abilities, analytical skills, and problem-solving capacities in a stress-free environment. This paper highlights how playful learning not only sustains children's natural curiosity but also significantly improves their concentration, memory, and spatial reasoning. Ultimately, the study concludes that the systematic application of game technologies transforms complex, abstract logical concepts into engaging, accessible, and practical experiences for young learners, laying a strong foundation for their future academic success.

Keywords: logical thinking, game technologies, primary education, didactic games, cognitive development, playful learning, problem-solving skills, interactive pedagogy.

The transition from preschool to primary education marks a significant milestone in a child's cognitive and psychological development. During this period, the primary leading activity shifts from play to formal academic learning. However, developmental psychology asserts that the need for play does not abruptly disappear when a child enters the first grade. Instead, it remains a powerful, intrinsic motivator. Forcing young learners into rigid, traditional academic frameworks can often lead to diminished interest, cognitive fatigue, and anxiety. To bridge this gap, modern pedagogy heavily advocates for the integration of game technologies into the educational process.

Unlike mere entertainment, educational game technologies are structured, goal-oriented activities designed specifically to foster cognitive skills, particularly logical thinking. Logical thinking is not an innate ability; it must be systematically cultivated. In early childhood, logic begins with concrete, tangible operations before evolving into abstract reasoning. Game technologies serve as the perfect medium for this transition because they translate complex mental operations—such as analysis, synthesis, comparison, classification, and generalization—into accessible, engaging tasks.

When a primary school student engages in a carefully designed didactic game, they are required to observe rules, anticipate the consequences of their actions, and formulate strategies. This continuous loop of decision-making and feedback is the very essence of logical reasoning. For instance, when children play board games that require spatial awareness or puzzle-solving, they learn to recognize patterns

and sequences. They begin to understand cause-and-effect relationships in a safe environment where making mistakes is just a natural part of the game, rather than a penalized academic failure. This drastically reduces the fear of being wrong, encouraging a trial-and-error approach that is fundamental to critical and logical analysis.

Furthermore, word games, riddles, and semantic puzzles stimulate linguistic logic, enriching their vocabulary while teaching them to categorize and classify concepts. Role-playing and simulation games also play a crucial role in this developmental stage. By stepping into different scenarios, children must navigate simulated problems that require deductive and inductive reasoning to resolve. They learn to break down a larger problem into smaller, manageable parts, a skill directly transferable to core subjects like mathematics and science. The integration of modern digital educational games also offers interactive platforms where adaptive algorithms challenge a child's logic at their specific developmental level, providing immediate reinforcement.

However, the success of game technologies in developing logical thinking heavily relies on the teacher's pedagogical competence. The educator must act as a facilitator rather than a strict director. It is the teacher's responsibility to select games that align with the curriculum and the specific cognitive needs of the students. A didactic game must have a clear beginning, a process that requires active cognitive effort, and a definitive conclusion that allows for reflection.

Post-game discussions are absolutely critical; asking students why they made certain choices or how they solved a particular problem forces them to verbalize their logical processes, thereby reinforcing their cognitive development. Moreover, group games foster social logic and emotional intelligence, as children must negotiate rules, collaborate, and understand different perspectives to achieve a common goal.

Ultimately, game technologies transform the traditional classroom into a dynamic laboratory of thought. By leveraging the child's natural inclination towards play, educators can construct a rigorous yet deeply engaging learning environment. The strategic use of games ensures that the development of logical thinking is not perceived as a tedious academic chore, but rather as an exciting intellectual adventure. This harmonious blend of play and education lays a robust cognitive foundation, equipping young learners with the analytical tools they will need for lifelong academic and personal success.

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