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Psycho-Physiological Characteristics of Primary School Students and Objectives for Developing Logical Thinking

Ahmedova Umidaxon Yodgorjon qizi
Doctor of Philosophy in Pedagogical Sciences (PhD), Uzbekistan

Xojimamatova Jamila SHavkatjon qizi
Graduate Student, Fergana State University, Uzbekistan

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Abstract: This article provides an in-depth analysis of the psychological and physiological characteristics of primary school-aged students, their cognitive processes, and the pedagogical significance of developing logical thinking. The research examines age-specific developmental features, including the formation of thinking, attention, memory, and perception during the initial stages of education. Furthermore, the primary goals, methods, and tools for fostering logical thinking are theoretically substantiated. The article is intended for primary school teachers, educators, and specialists in the field of education.

Keywords: Primary school age, psychological characteristics, physiological development, logical thinking, primary education, cognition.

Introduction: In the modern education system, the comprehensive development of primary school students is a critical pedagogical issue. This specific age period is characterized by the formation of the child's personality, the activation of cognitive processes, and the development of their attitude toward learning. Therefore, understanding the psycho-physiological traits of these students is essential for fostering logical thinking.

Developing logical thinking in primary education enables students to think independently, analyze problems, and apply knowledge in practice. Broad social motives in young learners typically manifest through a desire for self-improvement (e.g., becoming a cultured and knowledgeable person) and self-determination (choosing a future career or continuing education). As children recognize the social importance of education, they develop personal readiness and positive expectations toward school. While feelings of duty and responsibility may not be fully conscious at first, they manifest through the diligent execution of the teacher's assignments.

LITERATURE REVIEW

During the primary school years, children undergo rapid physical and mental changes:

Physiological Traits: The skeletal system is not yet fully ossified, and fine motor skills are still developing. Consequently, children tire quickly and cannot sit still for long periods.

Cognitive Traits: Involuntary attention prevails as stable concentration is still forming. Perception is sensory-oriented; children process information based on brightness and external appearance. Mechanical memory is often stronger than logical memory, leading to a tendency for rote memorization rather than deep conceptual understanding.

Goals of developing logical thinking:

1. **Transitioning from visual-image thinking to verbal-logical thinking**: Teaching children to think about abstract concepts, not just visible objects.

2. **Developing independent thought**: Enabling children to find solutions in problem-oriented situations rather than waiting for ready-made answers.

3. **Increasing intellectual potential**: Preparing the child's intellect for the mastery of complex subjects.

METHODOLOGY

Logical thinking is the ability to identify cause-and-effect relationships, draw conclusions, analyze, compare, and generalize. A student with developed logical thinking can justify their opinions and make independent decisions.

In primary grades, developing these skills ensures that students:

Work independently.

Acquire knowledge consciously.

Enhance creative abilities.

Teachers must organize the educational process by considering individual age characteristics. Encouragement, support, and a positive environment are vital catalysts for cognitive growth.

RESULTS

According to D.B. Elkonin, since learning is the leading activity for primary school students, it mediates all their social relationships and fosters core personality traits [10, p. 246]. L.V. Obukhova notes that if a child learns to manage their psychological behavior, they can successfully navigate the transition from "I want" to the "I must" required by school discipline.

Stages of Logical Thinking Development

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Stage	Methodological Recommendation	Description
Stage I	Object-based & Active Thinking	Grouping and touching physical objects.
Stage II	Visual-Image Thinking	Identifying connections through pictures and diagrams.
Stage III	Abstract-Logical Thinking	Drawing conclusions, identifying laws and concepts.

The "FSMU" Method (Uzbek acronym for Opinion, Reason, Example, Summary):

- **Opinion (Fikr):** The student is presented with a problem.
- **Reason (Sabab):** The student explains why they think that way.

- **Example (Misol):** The student proves their point with real-life examples.
- **Summary (Umumlashtirish):** A final conclusion is reached.

Cognitive Process Development Levels (Approximate %)

Cognitive Process	Development Level (%)
Perception	80%
Memory	75%
Speech	70%
Attention	65%
Thinking (Tafakkur)	60%

Research shows that children with well-developed logical thinking grasp social sciences 30-40% faster than their peers.

CONCLUSION

In conclusion, accounting for the psycho-physiological characteristics of primary school students significantly increases educational efficiency. Developing logical thinking is a cornerstone of intellectual potential. By utilizing game-based logic tasks and acknowledging physiological fatigue, educators can foster an environment where students transition from rote memorization to conscious, creative, and independent learning.

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