



## THEORETICAL FOUNDATIONS FOR THE DEVELOPMENT OF LOGICAL THINKING WITH THE HELP OF INNOVATIVE TECHNOLOGIES

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### ABSTRACT

The article highlights the psychological and pedagogical aspect of the problems of the development of logical thinking of primary school students. Influence of innovative pedagogical technologies on the process of teaching younger students. Conclusions of experimental work on the development of logical thinking.

**Keywords:** research, innovative technologies, indicators of the development of logical thinking

The relevance of research. The development of logical thinking in younger students is a necessary stage in their psychological development, as well as their most comfortable adaptation in modern society. Thus, the relevance of this study lies in the need to improve various methods of teaching younger students, aimed at developing their logical thinking. If we talk about the features of the cognitive and educational activities of a younger student, then we can distinguish the following components: perception; memory; reproduction; attention (switching); imagination; thinking (comparison, abstraction, generalization); speech.

Reproduction is a difficult activity for a younger student, requiring goal setting, the inclusion of thinking processes, and self-control. Imperfect in younger students and such an important property of attention as switching. The abstraction of a junior schoolchild differs in that external, bright one is taken as essential features. Children more easily abstract the properties of objects than connections and relationships. Generalization in the primary grades is characterized by the awareness of only some of the signs, since the student cannot yet penetrate into the essence of the subject. And finally, the conclusion is made by him on the basis of knowledge of general theoretical concepts. Deductive reasoning is more difficult for a younger student than inductive





reasoning. At primary school age, children become aware of their own mental operations, which helps them to exercise self-control in the process of cognition. In the process of learning, the qualities of the mind also develop: independence, flexibility, criticality.

### The Influence of Innovative Pedagogical Technologies on the Learning Process of Primary School Students

The scientific innovations that drive progress cover all areas of human knowledge. There are socio-economic, organizational and managerial, technical and technological innovations. One of the varieties of social innovations are pedagogical innovations. Pedagogical innovation is an innovation in the field of pedagogy, a purposeful progressive change that introduces stable elements (innovations) into the educational environment that improve the characteristics of both its individual components and the educational system itself as a whole.

At the moment, a variety of pedagogical innovations are used in school education. It depends, first of all, on the traditions and statute of the institution. Nevertheless, the following most characteristic innovative technologies can be distinguished: information and communication technologies in subject education; personality-oriented technologies in teaching the subject; information and analytical support of the educational process and quality management of education for schoolchildren; monitoring of intellectual development; educational technologies as the leading mechanism for the formation of a modern student; didactic technologies as a condition for the development of the educational process; psychological and pedagogical support for the introduction of innovative technologies in the educational process of the school.

There is another classification of pedagogical innovative technologies that is used in teaching children. Such innovative learning technologies include: interactive learning technologies, project-based learning technology and computer technology. Criteria, indicators, levels of development of logical thinking of primary school students were identified using computer tools.

Determined the level of ability to apply logical actions in practice.

Within the framework of theoretical and activity criteria to determine the ability of primary school students to understand the learning task and to determine the level of development of the ability of younger students to plan their actions, the technique of "Logical tasks" was used.

Analyzing the work obtained in the course of the ascertaining experiment, it should be noted that the children expressed uncertainty in the ability to solve problems. This was expressed by the fact that the children constantly asked whether they had solved



this or that problem correctly. The rest of the children actively participated in the testing with expressed interest and confidence in their actions.

To determine the level of development of the ability to plan their actions, the test "Logical tasks" was taken.

Based on the test results, a table was compiled that reflects the ability of the class to plan their actions. On average, the level of development of planning their actions in two cases is satisfactory. As part of a practical criterion to determine the level of application of simple logical actions in practice, the "Think!" methodology was used, which offers 5 tasks of a mathematical and everyday nature. This technique reflects a number of indicators: the use of simple logical operations in mathematics; application of logical skills in everyday life; ability to solve problems that require logical actions. According to the test results, it can be seen that younger students have sufficiently developed logical thinking, but not everyone can apply logical actions in practice. Most of the class is at the lower level, which indicates the inability to solve such problems. Based on the analysis of the test, a table was compiled in which the result of the answers was placed in percentage terms.

The general results of the initial level of logical thinking were as follows: students have little command of logical actions, are unable to single out a learning task and apply their knowledge in practice. However, they show a desire to develop their logical skills, middle-level students kept within the task, most of the tasks were solved correctly. Children of this level can single out a learning task, try to plan their actions, but cannot put into practice general logical operations. Expressed interest in further development. A high level of logical thinking implies full possession and application of the basic logical actions that are characteristic of primary school children. That is, children of this level easily single out a learning task, plan their actions, applying their knowledge in practice. They also strive to further develop their abilities. As a rule, such students have an interest in the exact sciences such as mathematics, physics and computer science.

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