



## Foundations for the Development of Creative Thinking in Younger Schoolchildren as A Psychological and Pedagogical Problem

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**Abstract:** This article examines foundations for the development of creative thinking in younger schoolchildren as a psychological and pedagogical problem

**Key words:** Pedagogical impact, teacher-student relationship, emotional aspect, motivation, interaction, personality.

Each person perceives the world around him and wants to understand it. To understand means to realize the nature of an object or phenomenon and to find its essence in it. We can say that understanding is the most complex cognitive psychological process called thinking. Before moving on to a discussion of creative thinking in the lower grades, let's define thinking as a psychological process in general.

First of all, it should be noted that thinking is the highest cognitive process. Thinking refers to the acquisition of entirely new knowledge or the creative transformation of existing ideas and knowledge. Thinking should also be understood as the acquisition by a person of completely new knowledge.

Thinking as a special mental process has several specific features. The first of them is a generalized reflection of reality. The second, no less important, is the indirect comprehension of objective reality.

Secondly, the most important feature of thinking is that thinking is almost always associated with solving problems that arise in the process of cognition and practical activity. Thinking always begins with a problem, the answer to which is the goal of thinking. The answer is not found immediately, but with the help of certain mental operations.

An extremely important characteristic of thinking is that it is inseparable from speech. We always think in speech. In other words, we cannot think if we do not speak; according to A.G. Maklakov, thinking is cognition that generalizes, reflects and mediates reality (Maklakov, 2008).

Other authors understand thinking as the movement of ideas, as an understanding of the nature of things. The result of thinking is an idea or a thought, not an image.

Unlike other psychological processes, thinking proceeds within a certain logical framework. Therefore, psychologists distinguish several logical operations in the structure of thinking: analysis and selection of the main thing (synthesis), comparison, abstraction, generalization and concretization.

Analysis is understood by N.F. Tarygina as "a mental division of something or a mental selection of individual features of an object." The meaning of this process lies in the fact that when we perceive any object or phenomenon, it allows us to mentally separate its parts. As a result, we can find out



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what parts the perceived object consists of. In other words, through the process of logical analysis, we can learn the structure of what we perceive. Synthesis is understood as a combination of various elements into a single whole (Talyzina, 2006, 40).

Mathematicians-methodologists argue that analysis and synthesis complement each other (analysis is carried out through synthesis, and synthesis through analysis). Analysis" and "synthesis" are diametrically opposed in meaning, but are closely related. Thus, these logical operations are involved in any complex mental process (Beloshistaya, 2009).

The ability to analyze and synthesize is manifested not only in the ability to single out elements and various properties of an object or to combine elements into a whole, but also in the ability to include them in new connections and define new functions.

Comparison is understood as a logical method of mental actions, requiring the identification of similarities or differences between the characteristics of an object, thing or phenomenon. The creation of a comparison technique should be carried out in stages. The comparison technique should include the following operations:

- 1) Select the properties of the object;
- 2) Determine the general characteristics of the object; And
- 3) determine the basis for comparison; And
- 4) comparison of objects in accordance with this logic (Talyzina, 2006). Logical comparison can be carried out in two ways: indirect and direct methods. If it is possible to simultaneously perceive and compare two objects or phenomena, then a so-called direct comparison is carried out. When comparison is carried out by inference, indirect comparison is used (Volkov, 2005).

Abstraction is understood by N.B. Istomina as "a mental distraction from any part or feature of an object in order to highlight its essential features". Abstraction is understood as the ability to abstract from non-essential properties and highlight only essential ones. Essential properties can be extracted from a concept because they are part of the concept itself. In contrast, non-essential properties are properties that vary and are not common to describe a set of objects or phenomena (Istomina, 2000, 173).

Another important logical operation is generalization, which means the expression in words of the results of the comparison process. Abstraction and generalization are considered interrelated.

Concretization is understood as a process opposite to abstraction. It is this logical process that exemplifies or explains the general.

There are three types of thinking: conceptual (thinking that primarily expresses the general, important or characteristic features of a real object or phenomenon), judgment (a thinking process that includes the assertion or denial of a condition about an object, phenomenon or feature) and deductive (a thinking process in which two or more judgments are derived from completely new judgment, conclusion or result) (Rubinshtein, 2009).

If we consider reasoning, then people are capable of two main types of reasoning: deductive and inductive. While inductive reasoning is reasoning from the particular to the general, deductive reasoning is reasoning from the general to the particular.

For these reasons, psychology classifies the types of thinking as follows:

- 1) development (visual-effective, visual-figurative, verbal-logical, abstract-logical);
- 2) the nature of the problem being solved (theoretical, practical); And
- 3) Degree of development (reasoned, intuitive);



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4) the degree of novelty and originality (reproductive and generative thinking) (Nemov, 2003); Visual-figurative and realistic thinking is characterized by the fact that the process of thinking is a practical transformative activity that a person performs with real objects. This type of thinking develops in people engaged in real work in production.

Visual-figurative thinking is understood as a type of thinking based on images and ideas. This type of thinking is the most basic type of thinking that arises in practical activities and is the basis for the formation of more complex types of thinking. Thinking that arises through the logical manipulation of concepts is also known as verbal logical thinking.

Verbal logical thinking is a type of logical thinking characterized by its implementation with the help of logical operations.

Abstract-logical thinking is understood as a kind of thinking based on the allocation of essential connections and properties of objects and the abstraction of non-essential ones.

Theoretical thinking is understood as a kind of thinking based on theoretical reasoning and deduction. In theoretical thinking, laws and rules are studied.

Practical thinking is a type of thinking that is often compared to theoretical thinking. However, practical thinking is associated with goal setting.

Discriminatory thinking is characterized by thinking that is not directly related to the logic of reasoning. Moreover, this type of thinking develops over time and has stages that are well understood by the subject. This type of thinking is the opposite of intuitive thinking, which develops over time and has no stage differences.

Generative thinking plays an important role and is characterized by low productivity. With this type of thinking, students solve problems that are structurally known to them. Moreover, reproductive thinking allows them not only to assimilate completely new material, but also to use it in practice, if this does not require any transformations.

Generative thinking is also called creative thinking. Productive (creative) thinking is understood as creative imaginative thinking. Innovative products are characterized by specific features of their production processes and a significant impact on the formation of intelligence (Nemov, 2003).

Creative thinking cannot be associated with any one type of thinking. Psychologists have spent a lot of time and effort trying to understand how people find solutions to new and rather unusual problems. Until now, there has been no clear answer to the question of the psychological nature of creativity. Psychology has only a few data to explain the process of problem solving and to characterize the conditions conducive to finding accurate solutions. The main feature of creative thinking is the ability to analyze emerging problems, as well as the ability to establish systemic connections.

Domestic and foreign psychologists note that creativity as an object of scientific knowledge has special qualities, and the process of studying it is not only complicated, but also difficult to characterize. Therefore, in foreign psychology, creative thinking is associated with the term "creativity": In the 20th century, the impetus for highlighting this type of thinking was the information that there was no correlation between intelligence and success in solving problem situations. Therefore, success in solving problem situations depends on the ability to quickly retain such a variety of information in the head. This kind of thinking is called creativity and has come to be studied separately from human intelligence as thinking associated with creating or discovering something completely new.



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Many psychologists are of the opinion that creativity is recognized as creative thinking. And they identify four parameters that characterize creative thinking:

- 1) Convenience
- 2) Flexibility
- 3) originality
- 4) elaboration of ideas (Vinogradova, 2003).

The type of thinking, called creativity in foreign psychology, is actively studied by British and American psychologists, but the nature of this feature has not yet been determined.

In domestic psychology, as well as in foreign psychology, the question of creative thinking is posed as a problem of productive (creative) thinking, since it is an objective one. Thus, in any thought process, productive and unproductive elements are interconnected.

Creative thinking is understood as thinking ie, associated with the creation, discovery and transformation of knowledge. This includes imagination, fantasy, and so on. N.V. Druzhinin, who studied creative thinking, found that “creative people often have an amazing combination of mature thinking, deep knowledge, various talents, abilities and skills, as well as peculiar “childish” features in their view of reality, behavior and actions” (Druzhinin, 2009 , 351).

So, E.S. Zharikov singled out the following as characteristic features of creative thinking:

- 1) Openness - the ability to solve problems that require the discovery of both patterns and properties / relationships;
- 2) Creativity - the ability to formulate completely new methods;
- 3) Mobility - skills based on moving to the border areas of science and solving problems with the same goal;
- 4) Independence - the ability to resist traditions and attitudes that prevent the acquisition of new knowledge.
- 5) foresight - the ability to see the prospects of the object of study, predict future conditions and put forward hypotheses;
- 6) Systematicity - the ability to consider the subject of research as a whole
- 7) Rationality - an ability based on the rejection of outdated knowledge systems.
- 8) Openness - the ability to accept and reject different ideas
- 9) antinomy - the ability to see the unity of opposing or mutually exclusive definitions of an object
- 10) generalization (see, for example, Zharikov, 2000). Psychologists prove that a person has creative thinking if he can perform the following groups of logical operations: combining systems and their elements, identifying cause-and-effect relationships, and performing research operations.

The structure of creative thinking in mathematics is presented as follows:

- 1) The ability to formally recognize mathematical material and capture the formal structure of the problem;
- 2) The ability to think logically in the field of quantitative and qualitative relations; And
- 3) the ability to develop the process of mathematical thinking and the corresponding system of actions; And
- 4) the flexibility of the thought process in mathematical activity; And
- 5) the ability to quickly and freely recombine the direction of the thought process; 6) the ability to think clearly, simply and economically



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6) the ability to find solutions in a clear, simple, economical and rational way; 7) the ability to use the process of mathematical thinking and the process of mathematical reasoning to develop an appropriate system of actions

7) the ability to mathematical memory

8) mathematical orientation of mental abilities.

Creative thinking includes such "minor" elements as the speed of the thought process as a time characteristic; the ability to count quickly and accurately; remembering numbers, figures and formulas; the ability to establish spatial relationships; the ability to visualize abstract mathematical relationships and dependencies.

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