

**CONVERGENT AND DIVERGENT THOUGHT PROCESSES IN SCIENTIFIC  
THINKING**

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**Abstract.** In this article, the author has analyzed the practical importance of the thinking process used to create creative ideas by studying many possible solutions in convergent and divergent thinking and creativity in the effective organization of educational work for young people today. In addition, he emphasized that teachers should have sufficient knowledge, skills and qualifications in pedagogy, psychology, and pedagogical skills in order to effectively organize pedagogical activities. During the article, the effective organization of activities by early identification of children with high or low intelligence and high or low creativity was also widely covered.

**Key words.** Intelligence, creativity (creative), creative ability, IQ (intelligence quotient), convergent thinking, divergent thinking, activity, imagination, fantasy, hypothesis (hypothesis).

Currently, in the effective organization of educational work for the young generation, it is appropriate to pay attention to creativity (creative) ability in the thinking process used to create creative ideas by studying many possible solutions in convergent and divergent thinking (thinking).

Until now, the nature of individual differences in the manifestation of creative activity is a topic discussed in psychological literature.

It is impossible to understand the essence of creative activity without understanding the essence of creativity. V.N. According to Druzhinin, creativity and activity are opposite forms of activity (Druzhinin, 2007).

External activity can have an adaptive character when the subject adapts to the world around him, and a transformative character when the subject changes his environment. According to Drujin, creative behavior is a constructive transformative activity that creates a new environment. "Creativity, in contrast to various forms of adaptive behavior, is not based on "because" or "in order to" (causal and theological) principles, but "in spite of everything", that is, the creative process occurs spontaneously. is the coming and ending reality" (Drujinin, 2000, p. 159).

A. Maslow believes that the ability to be creative is inherent in every person (Maslow, 2008). The motivation for personal growth is the source of creativity - the need for self-realization. Maslow defines creativity as a universal human function that determines the most diverse forms of self-expression in this place. A. Adler followed the same views. He believed that every person has a pre-existing creative power. Realizing his potential, a person manages his life. According to Adler, creativity is a unique way of compensating for a set of shortcomings (Adler, 2004).

K. Rogers states that creative activity is life itself, perception of the surrounding world (Rogers, 1994). The main motive of creativity is a person's desire for self-realization or self-realization. This desire is common to everyone, but can be suppressed with psychological protection. Rogers understands creativity as creating a new product. Rogers writes: "I understand the creative process as an activity, on the one hand, aimed at the creation of a new product that grows out of the identity of the individual, and on the other hand, life depends on material, events, people and circumstances. ." (Rogers, 1994, p. 326).

J. Kelly's theory of "personal constructions" considers creativity as a simple alternative. He first described alternative hypothetical thinking. A creative person is a researcher who interacts with the world effectively, creatively, interprets the world, processes information to predict events. He puts forward hypotheses about reality, with the help of which he tries to predict and control events. Since the image of the world is hypothetical, people form hypotheses, test them, that is, perform mental actions like scientists in the process of scientific research. Thus, Kelly assigns a special place to cognitive processes in creative activity (Kelly, 2000).

Based on a systematic approach, D.B. Bogoyavlenskaya singles out intellectual activity as a unit of studying creativity. He stated that "a measure of intellectual activity, its most important qualitative characteristic may be intellectual initiative, which is the continuation of mental activity outside the scope of situational tasks, not because of practical needs or external or subjective negative evaluation of the work." understood. (Bogoyavlenskaya, 1983, p. 191). That is, creativity is understood as being able to go beyond the requirements, to set a goal for yourself. Bogoyavlenskaya, on the other hand, believes that "creativity is a product of the intellect broken through the mentalizing or stimulating motivational structure" (Bogoyavlenskaya, 1983, p. 194). The intellectual component of the system works only through the motivational sphere of the individual. N.L. Gindlis Bogoyavlenskaya's research within the concept of creativity conducted and came to the conclusion that the creative potential of a person depends on the subject himself and the characteristics of his upbringing and development (Gindlis, 2007).

One of the reasons for the contradictions in the research of psychological mechanisms of creative activity, in our opinion, is the confusion of the concepts of "creativity" and "creativity", which are often considered as synonyms within the Western tradition.

In our opinion, we can talk about creativity supported by an individual subject only if there is some real product created by them that meets the criteria of objective innovation, that is, progressive in a specific problem area (artistic, scientific, social). can only speak if there is development.

Currently, the concept of creativity (creativity) is studied in terms of many explanatory schemes.

V.N. Druzhinin defines four main directions in the study of creativity:

- 1) the first direction studies the product of creativity (its characteristics - quantity, quality, importance);
- 2) the second - considers creativity as a person's ability to overcome stereotypical options for problem solving;
- 3) the third - connects creativity with personal characteristics;

4) the fourth - considers creativity as a mental process (levels, stages and types of the creative process are distinguished) (Drujinin, 2007).

The concept of "intelligence" is more like convergent thinking in psychology. , for example, in school science assignments and standardized multiple-choice tests of intelligence) refers to the ability to answer "correctly" is consistent with the concept of seeking and producing a single correct answer.

Hiring a person based on IQ (intelligence quotient) and assessing his capabilities would be wrong. Therefore, since the 50s, in addition to the study of mental development, great attention has been paid to the study and measurement of a person's creative abilities. In this regard, special tests were created.

The concept of "creativity" corresponds more to the concept of divergent thinking. Divergent thinking (Divergent thinking is a thinking process or method used to generate creative ideas by exploring many possible solutions.), which branches out in different directions, spreads in different directions at the same time, and focuses on creating many solution options. thinking Because of this, divergent thinking leads to unexpected results and solutions.

When evaluating creative abilities (creativity), attention is paid to the "lightness", "adaptability and flexibility", "originality" of solving a given task. Creativity (general creative ability) characterizes the transformation of knowledge. Creativity is related to the processes of imagination, fantasy, hypothesis.

M. Vollach and N. Kogonlar divided four groups of students as a result of studying creativity in 11-12-year-old children.

1. Children with high intelligence and high creativity. They believe in their abilities, their self-assessment is adequate. They have a high level of self-control and internal independence. They have the psychology of children, but they can behave like adults if the situation demands it. They are interested in all unusual, new things, are very proactive, can adapt well to the social environment while maintaining their independence, freedom of thought and action.

2. They have high intelligence and low creativity. They strive to show themselves at school and get high grades. They experience failure hard, it can be said that they have a lot of fear of failure rather than confidence in success. They do not take risks, they do not express their thoughts in front of many people. They are quiet and do not like many (classmates). They have very few close friends. They do not like it when they are left to their own devices, they need their work, studies, and behavior to be evaluated adequately from the outside.

3. They have low intelligence and high creativity. Such students are often considered "bad". It is difficult for them to adapt to school requirements, often their interests are outside of school, where they show their creativity. They are often restless, do not trust themselves, and feel humiliated. Often, teachers rate them as inattentive and inattentive, because these children reluctantly do the same, boring work, and cannot concentrate on work.

4. They have low intelligence and low creativity. They adapt well to the external environment, often have an "average" position. They are satisfied with their social status. Their self-assessment is adequate, their low ability to study subjects is compensated by their high social intelligence, cheerfulness, passivity in studying.

In conclusion, it can be said that in order to effectively organize pedagogical activity, teachers need to have sufficient knowledge, skills and qualifications in pedagogy, psychology, and pedagogical skills. by analyzing the practical significance of the thinking process used to create creative ideas by studying the creativity (creative) ability, convergent and divergent thinking (thinking) in the effective organization of educational work, and early identification of children with

high or low intelligence and high or low creativity I believe that it will contribute to the increase of real specialists of their profession for the further development of society with the effective organization of pedagogical activities.

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