



## FORMATION OF STUDENTS' CREATIVE THINKING

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<https://doi.org/10.5281/zenodo.10990589>

### ARTICLE INFO

Received: 10<sup>th</sup> April 2024

Accepted: 17<sup>th</sup> April 2024

Online: 18<sup>th</sup> April 2024

### KEYWORDS

*Creative thinking, education, lesson, assessment of creative thinking.*

### ABSTRACT

*Teaching students to think creatively, developing creative abilities is one of the urgent issues of today's education. This article discusses the issues of developing students' creative thinking in the educational process, using foreign experience, evaluating students' creative thinking based on an international program.*

Creative approaches and achievements have advanced human civilization worldwide in fields ranging from science and technology to philosophy, art, and the social sciences. Creative thinking is more than just coming up with random ideas. It is a real skill based on knowledge and experience that allows a person to achieve better results in sometimes difficult situations. Societies and organizations around the world increasingly need innovative knowledge and creativity to solve problems, which in turn increases the importance of innovation and creative thinking. It is true that the impact of creative thinking on the whole society is behind significant types of innovation, but it is also a phenomenon with a universal and equalizing nature, that is, any person, to one degree or another, has the ability to think creatively.

Scientific works of L. Vygotsky, A. Leontev, D. Elkonin, O. Vasilchenko, E. Melkumova, V. Miretskaya, M. Sukhomlinova, E. Emmanuel among the scientists of the Commonwealth of Independent States have studied the theoretical foundations of the development of individual creative abilities. In the works of foreign scientists such as E.P.Torrance, N.Rogers, J.Purnell, P.Roberts, A.M.Galligan, Sh.Tatsuno, the issues of individual abilities and creative potential of a person are disclosed.

In fact, according to experts in the field of education and psychologists, creative thinking, understood as being engaged in thought processes related to creative activity, leads to the development of a number of other personal skills. These include metacognitive skills, interpersonal and self-awareness skills, and problem-solving skills. At the same time, personal growth, educational success, future professional success, and public reputation also depend on a person's creative thinking skills.

The development of an international program for the assessment of creative thinking can lead to positive changes in educational policy and pedagogy. The PISA Assessment of Creative Thinking in Research provides a clear, reliable, and actionable assessment tool to



help policymakers make evidence-based decisions. The results also fuel debate in society about the value and methods of developing this important skill through education. This activity in the international assessment program PISA is related to another project of the Organization for Economic Co-operation and Development aimed at supporting a new pedagogy for the development of creative thinking. In creative thinking, the main task of education is to form the skills that the student will need today and in the future to lead a successful life in society. Creative thinking is an important skill that today's youth must have, and this skill will help them adapt to a constantly and rapidly changing environment that requires personnel with up-to-date skills beyond simple literacy. In general, today's students will work in fields that do not even exist in the future, forming new skills for new problems will allow them to solve increasingly complex local and global problems through an unusual approach. The importance of developing creative thinking at school is not limited to the labor market. School is important for young people to discover their abilities and skills, including creative talents. Creative thinking also supports student learning by interpreting events, experiences, and behaviors in new and personally meaningful ways.

Learner curiosity comes into play in the learning process, creative thinking thus becomes a means of mutual agreement, even in the context of predetermined educational goals. In order to increase the student's motivation and interest in the school, it is necessary to introduce new forms of education that take into account the creative potential and enthusiasm of all students. This can especially help students who are not very interested in the educational process, and it will help them express their opinions and develop their potential.

Like other skills, creative thinking can be developed through a practical and focused approach. It seems to some teachers that the development of student's creative thinking comes at the expense of other subjects in the curriculum. In fact, students can think creatively in all subjects. Creative thinking is especially important as it is developed through approaches that support research and invention instead of blind memorization during the lesson aimed at imparting knowledge.

Teachers should be able to distinguish creative thinking, know the conditions suitable for such thinking, and know how to help students to think more creatively. A more thorough idea of how creative thinking occurs, in turn, requires teachers to have a certain amount of time in the educational process for students to have creative ideas. Assessment of creative thinking skills is based on evidence-based evidence, linking what students do, learn, and create on a computer platform to multifaceted competencies.

Assessment of creativity is the analysis of specific claims about a student's abilities in an evidence-based reasoning process. In general, student responses to assessment tasks provide evidence for this reasoning process, while psychometric analysis determines whether the evidence is sufficient to analyze each claim. The PISA assessment program can be used as the main framework for assessing creative thinking.

PISA uses a description of creative thinking appropriate for 15-year-old students. In the PISA study, creative thinking is defined as the ability to effectively participate in the development, evaluation and improvement of ideas that lead to original and effective



solutions, achievements and imagination in the field of knowledge. This description emphasizes that students need to learn to participate effectively in ideation practices at different contexts and levels of education, to reflect on an idea while evaluating its originality and validity, and to refine the idea until it is ready. The development of this description also took into account the advice of experts in various fields and the results of an extensive literature review on creativity.

While creative thinking is a nascent interpretation, the construct of creativity has a broad and strong research tradition. Creativity, then, is the interaction between ability, process, and environment through which an individual or group creates a meaningful product that is both new and useful for that social context.

Achieving creative goals requires creative thinking, but it also requires broader and more specific skills and abilities, such as mental capacity, domain knowledge, and artistic talent. For example, great creativity related to the creation of masterpieces of art or technological discoveries requires, in addition to creative thinking, considerable talent, deep knowledge, tireless work in a specific field, and recognition by society that this product has value. On the contrary, small or everyday creativity (for example, skillfully arranging pictures in a photo journal, creating a new dish from leftover food, or finding a creative solution to a complex problem at work) is necessary for almost all people who are capable of creative thinking.

In order to reduce the importance of innate talent and place more emphasis on an individual's ability to think creatively, which can be improved, the PISA assessment of creative thinking focuses on this sub-task of creativity. This type of creative thinking applies not only to educational contexts, such as writing an essay or painting, where reflection of the inner world is mainly required, but also to broader areas related to the analysis of ideation issues and solving problems in society.

As the first generation of creative thinking tests was based on the idea of domain generality, i.e., the existence of common features of creativity in any field, researchers assumed that the results of the individual in the tests that assess creativity can be generalized, and that creativity in one field can be transferred to another field. These studies either emphasize that the abilities and skills required for creativity are domain-specific and differ from domain to domain, or present models of creativity that partially combine the two approaches. A "domain" is defined as "any particular field of science, such as art, literature, history, or astronomy," or "a set of representations underlying and supporting a particular field of science."

Researchers have listed the following domains of creativity: everyday, educational, action, science, and art. Creative activity is divided into "artistic" and "scientific" spheres. Creative activity can be divided into three general domains: verbal, artistic, and problem solving. According to a detailed analysis of practical studies that have studied the fields of creativity, the scientific field of mathematics is always clearly distinguished from other fields of creativity. Four necessary parts for creative activity of any person are listed:

- industry-specific skills;
- processes related to creativity;



enthusiasm for the task (motivation);  
suitable, comfortable conditions.

In summary, creative productivity is a basic resource or domain-specific set of skills, including knowledge and technical skills, which require the necessary motivation to move away from ready-made manuals to combine them in new ways. These four components consist of both stable and improvement and environmental sensitive components.

It is also appropriate to analyze how students' creative thinking indicators depend on their research abilities. Similar to the method used to measure a student's motivation, his research ability can be analyzed based on the data obtained from observing his behavior on a computerized test (telemetry).

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