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## Assessing the Readiness of Teachers to Develop the Creative Potential of Youth in the Higher Education System

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### Abstract

Modern economies and societies are undergoing constant changes in various areas. This condition is called “turbulence”. In these conditions, it is not enough for educational organizations of higher education to prepare highly specialized graduates with a sufficient amount of theoretical and practical knowledge. It is important to ensure the development of the creative potential of young people in order to teach them to adapt to constant changes and find extraordinary creative solutions to professional problems in conditions of turbulence. In this regard, it is necessary to study the degree of readiness of higher school teachers for this urgent task – the development of the creative potential of youth. The purpose of this study is to develop a methodology for assessing the readiness of teachers to develop the creative potential of young people through educational practices. After conducting a theoretical analysis, the authors took as a basis works using the Big Six (BIG 6) and CIE (Creativity, Innovation, Entrepreneurship) methods. As a result, based on a generalization of the experience previously accumulated in the global scientific community, combining approaches to the study of creativity in Pedagogy, Psychology and Economics (entrepreneurship), a questionnaire was compiled to assess the readiness of teachers of educational institutions of higher education to develop the potential of young people, including their creativity. The questionnaire involves diagnosing not only the readiness of individual teachers, in isolation from the context, but also makes it possible to take into account the quality of the educational environment and the diversity associated with the content of various academic disciplines.

The questionnaire developed in this study can be used to assess the above parameters both at the level of an individual educational organization and at the regional and state level, which can further become the basis for developing recommendations for the development of the educational environment at all three levels: state, region, educational organization of higher education.

**Keywords:** creativity, potential, development, teacher, student, assessment.

### 1. Introduction

The relevance of this study is associated with a number of problems in both higher and secondary education, noted in domestic and foreign publications. There is a problem of inequality in obtaining quality higher education (Prakhov, 2023), including in terms of gender and “payback” in the future (Quadlin et al., 2023); in addition, it raises questions about both the content of education and the teaching methodology itself. For example, there is much talk about the rise of gamification in education, but the relationship between gamification and student knowledge, engagement, and satisfaction is poorly understood (Murillo-Zamarano et al., 2023).

Additionally, universities have been criticized for not producing graduates with sufficient ability or experience in creativity or innovation (Gube, Lajoie, 2020). It is also worth noting that all

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of the studies listed above ask questions about quality, availability, demand, etc. higher education for the student, losing sight of the second participant in the educational process – the teacher. We want to fill in this gap in our work.

Of course, in addition to the student and the teacher, student government bodies and administrative units that are in close contact with them (administrations for academic and educational work) are involved in the educational process, however, our main task is to develop a methodology for assessing the readiness of teachers to form creative potential youth, and therefore the object of our research will be only teachers.

Thus, this study is designed to solve the following problems: (1) identify criteria for creative potential (creativity), (2) describe pedagogical methods and techniques for the formation and development of creative potential, (3) develop a methodology for assessing the readiness of teachers to use the selected techniques.

## 2. Materials and methods

On popular Internet sites, creativity is often seen as a more or less fixed trait that some people have and others lack. For example, Kaiser wrote: “There is no more controversy. Neuroscience confirms that highly creative people think and act differently than average people. Their brains are literally programmed in a unique way” (Kaiser, 2018). On this resource, he presented 20 distinctive features of creative people:

1. Their thinking never slows down;
2. They challenge the status quo;
3. They recognize their genius even if others don't;
4. They find it difficult to concentrate on a task;
5. They create cycles (creative activity is rhythmic and has periods);
6. They need time to recover (for example, prolonged loneliness);
7. They need space for creativity;
8. They focus intensely (cannot multitask effectively);
9. They care deeply;
10. They live on the edge of joy and depression;
11. They think and speak in stories;
12. They fight the Resistance every day;
13. They take their work as something personal;
14. They find it difficult to believe in themselves;
15. They have deep intuition;
16. They often use procrastination as a tool;
17. They are dependent on the state of creative flow;
18. They have difficulty completing projects;
19. They are better than others at connecting the dots (being able to see patterns before they become obvious to everyone else);
20. They will never grow up.

To evaluate these characteristics as truly distinguishing creative people from non-creative people from a scientific point of view, it is necessary to give a clearer definition of creativity.

There are many definitions of creativity and they vary from publication to publication, but most of them follow a “two-way standard definition”, according to which creativity includes, firstly, originality (novelty, uniqueness), and secondly, effectiveness (usefulness, relevance, applicability) (Runco, Jaeger, 2012). That is, originality by itself may lead to unhelpful products or ideas, and conversely, effective products or ideas by themselves may not contribute to new understanding or new knowledge.

The article by N.B. Shumakova presents approaches to measuring creative potential in modern foreign studies (Shumakova, 2021). The author rightly notes that there is terminological complexity associated with different understanding and interpretation of the concepts of “kreativnost” and “tvorchestvo” in Russian and foreign publications, but, at the same time, allows their use as synonyms. We will take the same approach – treat them as synonyms. This article provides a consensus definition of creativity as “the ability to generate original ideas that have value in their context” (Shumakova, 2021).

The most popular are two approaches to its measurement: “(1) component or resource-based, focused on the study of abilities and personal characteristics associated with creativity, and

(2) more holistic, based on the study of creativity using tasks from different areas that imitate real creative work. EPoC creative potential assessment method can be considered as the most promising tool that implements a holistic approach. However, as research shows, any approach to measuring creativity seems significant if it leads to information about the creative profile as a whole, and not about individual characteristics of the process or some cognitive or conative resource” (Convergent...).

Returning to the question of the differences between creative and non-creative people, we should turn to the thinking process. The researchers observed that the terms “creativity” and “creative problem solving” were often used interchangeably in the literature and applied the idea of “creativity as a process” to “creativity as problem solving.” It turns out that the most effective learning involves the initial divergent production of new ideas, followed by convergent selection and development of ideas. Convergent thinking occurs when the solution to a problem can be deduced by applying established rules and logical reasoning. This type of reasoning involves solving a problem in the context of known information and narrowing down the solution based on logical inference (Runco, 2011). There is following definition of divergent thinking is “cognition that goes in different directions”. Some of these directions are ordinary, and some are original. Because some of the ideas generated are original, divergent thinking represents the potential for creative thinking and problem solving. We agree with other scientists that “originality is not synonymous with creative thinking, but originality is undoubtedly the most widely recognized facet of creativity, as we wrote about above. To the extent that divergent thinking tests are reliable and valid, they can be considered an assessment of creative thinking potential. Not surprisingly, divergent thinking tests are among the most commonly used in creativity research. Divergent thinking tests are also used in numerous educational programs and in various organizational training packages” (Runco, 2011).

In the article of N.E. Sviderskaya, A.G. Antonov and L.S. Butneva (Sviderskaya et al., 2007) the features of the neurophysiological organization of divergent and convergent thinking are described. The authors conclude that “changes in the spatial organization of potentials, noted when using the model of divergent thinking, are similar to those observed when creative processes are activated” (Sviderskaya et al., 2007), which indicates the peculiarities of the neurophysiological mechanisms of divergent and creative thinking.

From the definition of creativity, we will move on to its structure and consider some socio-psychological theories of creativity. We will start with T.M. Amabile componential model of creativity. In a simplified form, the author initially proposed that three components at the individual level, namely domain-relevant skills, creativity-relevant skills, and task motivations, combine to allow creativity to arise at their intersection. Subject knowledge and skills are expert knowledge in a relevant field or fields – they include general intelligence, knowledge, experience, technical skills in a specific subject area in which creative problems are solved. The creativity-relevant skills or processes are cognitive processes of the individual that promote unconventional thinking and include cognitive style and personal characteristics. Task motivation involves internal motivation to participate in an activity out of interest, pleasure, or self-expression, as well as external incentives, such as monetary reward (Amabile, 2018). It is important to emphasize that the theory points to the need to merge all the components. Creative achievements are possible when a person is intrinsically motivated, has extensive subject knowledge and skills in a particular field, and has the ability to think unconventionally. In addition, the external environment allows him to express his creativity.

The influence of the social environment on the process was added later, reflecting the growing understanding of the critical influence of the social environment on creativity in the field of social psychology. Multicomponent model T.M. Amabile, especially after including the effects of the social environment, was one of the first theories to consider creativity holistically and systemically (Amabile, 2018). The systematic approach is an example of a social psychology approach that takes into account the complex, multifaceted interactions not only within an individual, but also the exchanges between the individual and his or her environment. Another version of a systematic approach to creativity was proposed in the works of M. Csikszentmihalyi (Csikszentmihalyi, 2014), who pointed out the interaction between the individual, the field (social institutions that act as judges that determine the value of the creative result) and the sphere (stable culture within which new ideas persist over time).

The componential model of creativity leads us to the idea that the following stages of this process can be distinguished:

1. Identification of a problem or task: the motivation of the task determines whether the search for a solution will begin or continue;
2. Preparation: domain-specific skills determine which paths will be available during the search for an answer;
3. Generation of the response: procedures related to creativity serve as an executive regulator and influence how the search for an answer will occur;
4. Answer checking and communication: domain-specific skills determine what criteria will be used to evaluate the answer;
5. The outcome: the corresponding decision is made; the outcome will in turn influence task motivation and further determine whether the process continues or ends.

Similar stages of creativity include the model of ecological systems for the development of creativity:

1. Preparation: collecting related information and organizing it into schematic models;
2. Incubation: analysis and synthesis of information in a diagram;
3. Insight: finding a connection between the information in the diagram and the formation of a creative product;
4. Evaluation: using the product and confirming its originality and value (Yeh, 2011).

### 3. Discussion

The analysis of previous research on creativity has shown the role of factors influencing the relative effectiveness of creativity training programs. Thus, more successful programs have focused on developing cognitive skills and heuristics associated with skill application, using realistic, domain-appropriate exercises (Scott, 2004).

If we return to the model of T.M. Amabile (Amabile, 2018), described above, then one of the tasks of universities is the development of professional skills. Theories of expertise describe how novices integrate new knowledge with previous knowledge to gradually become experts in their field (Lajoie, 2003). According to these theories, the intelligent, timely, and consistent use of relevant and goal-oriented learning strategies allows novices to move through a continuum of levels of the “mastery scale” of knowledge accumulation, becoming first experts and then masters, so that expertise can be acquired by most students (Chi, 2006). One of the key tenets of theories of expertise is that once expertise is achieved, a certain level of automaticity in problem solving occurs. The new expert’s knowledge is contextually interconnected and networked, which makes it possible to recognize the main patterns in the subject area. This increasing automaticity frees up cognitive resources for other tasks and allows students to not be overwhelmed by the constant processing of previously learned material (Bransford, 2000). However, high levels of knowledge and automaticity can be an obstacle to creativity and adaptation because the mere force of habit can inhibit creative thinking.

Thus, in the workplace, employees with more work experience have been found to have more difficulty adapting to new organizational and task demands, regardless of their chronological age (Ibrayeva et al., 2022) and, although students must have sufficient training to master a subject area, may there is a tipping point beyond which further teaching only serves to “over-socialize” the student and leads to rigid thinking and behavior.

Since, according to generally accepted definitions in the scientific literature, creative thinking is defined as the ability not only to generate new ideas, possibilities and alternatives in various situations, but also to evaluate and select the most creative ones, it can be expressed (among other things) in writing, open-ended problem solving, drawing, or music and can be measured by examining students' performance and work processes (Azaryahu, 2023). However, since this research is being carried out at the Financial University, we would like to focus on developing students' creativity (and teaching techniques) in the field of economics and finance. In this regard, the work of C.-M. Chou et al is of interest, in which creative, innovative and entrepreneurial abilities are considered as a decisive factor in increasing national competitiveness. This work attempted to integrate creativity, innovation, and entrepreneurship education with the Big Six Information Stages (BIG 6) learning strategy and examined its effectiveness on students' innovation motivation, creativity, metacognition, and self-esteem (Chou et al, 2023).

Since we are also interested in specific methodological techniques in the work of a teacher, before considering the results of the research obtained, we will briefly dwell on the content of the “Big Six”. It supposes six steps: (1) Task Definition: Be sure you understand the problem;

(2) Information Seeking: Identifying sources of information; (3) Location and Access: Gather relevant information; (4) Use of Information: Select a solution; (5) Synthesis: Integrate ideas into a product; and (6) Evaluation: double-check the result (Chou et al, 2023).

The BIG 6 teaching model can be used as a teaching strategy to solve information problems and can improve students' information literacy. Below we consider each step in terms of teaching students at university with major in economics and finance. As an example, let's take the preparation of a creative homework assignment on the topic "Risks of using cryptocurrencies as a means of payment"

(1) Task Definition: Be sure you understand what cryptocurrencies are and how this term relates to related concepts. What is the main problem that needs to be resolved?

(2) Information Seeking: Brainstorm keywords (other than cryptocurrency, means of payment, risk) that you will use to search for information. Browse the Internet for information, use various keywords to find possible information, and use various search strategies to increase the amount of information.

(3) Location and Access: Determine criteria and sort reliable sources containing information on cryptocurrencies and their prospects for use. What allows you to consider a particular source of information as a reliable one? What are the reasons to exclude certain information from the analysis?

(4) Use of Information: Interpret the information received. Organize information according to one or more criteria (for example, by sources of risk associated with the development of cryptocurrencies).

(5) Synthesis: Integrate ideas into a graphic form – students receive a "product" – chart, graph or scheme reflecting the approaches to understanding risks of using cryptocurrencies as a means of payment

(6) Evaluation: double-check the result. Conclude about the validity of the work and the effectiveness of the process of solving information problems: students think about the entire process of collecting, sorting and producing products and evaluate how the product can be improved.

It is impossible to ignore the fact that in addition to information literacy, the development of which is ensured by the use of the "Big Six", media literacy is also of particular importance. Media literacy is "the ability to adequately interact with flows of media information: search, analyze, critically evaluate and create media texts distributed through various media and communications, in all their diversity of forms" (Chicherina, 2012). Social media plays a significant role in the dissemination of information (Bajwa, 2022). That is, in addition to teaching students to solve information problems when analyzing scientific texts, attention should also be paid to the ability to work with financial media information and critically evaluate messages presented in the media, including social media.

In this regard, if we return to the issue of creativity and practical tasks, then it is possible to use the above-mentioned "Big Six" model to analyze various types of information messages presented in the media and social networks, including video and audio content, and not text messages only.

CIE (Creativity, Innovation, Entrepreneurship) education aims to develop creative educational courses, innovative topics and entrepreneurial business models to develop students' creativity, teamwork, creative thinking and entrepreneurial spirit. In education, CIE pays attention to indicators such as student innovative motivation, creativity, metacognition and self-assessment of employability.

Innovative motivation refers to the internal psychological process that causes and supports students' innovative activities and becomes the internal driving force for stimulating innovative behavior. Innovation motivation is an internal driving force that directly motivates and encourages students to participate in innovation activities and plays a role in guiding, stimulating and catalyzing students' innovative behavior (Chou et al, 2023).

Creativity is the process of understanding flaws, knowledge loopholes and missing elements of problems, finding answers, guessing solutions, forming hypotheses, modifying and re-testing as much as possible and finally communicating the results. CIE education values the attributes of creativity based on students' ability to produce creative outputs. Creativity is a type of psychological process that pays attention to the emergence and process of creativity and is associated with personality characteristics. Creativity and entrepreneurship are two interrelated competencies;

entrepreneurship promotes and results from creative activities related to real world problems to help students develop these competencies.

Metacognition (metacompetence) refers to the knowledge and regulation of one's own cognitive processes, which is considered a critical component of creative thinking that individuals can master, control, dominate, monitor, and evaluate their own cognitive process. The cognitive process includes memory, perception, calculation, association and other types of thinking. Metacognition is a phenomenon in which people control and direct their mental processes; it can be used for learning strategies: students, by controlling their own thinking patterns, can achieve effective learning methods, strategy selection and application in metacognition. It includes activities such as continuous attempts at planning, testing, monitoring, selection, review and evaluation. Metacognition involves building self-identity and self-esteem around entrepreneurial life ([Ecosystem..., 2023](#)).

Employability refers to a person's ability to obtain a job, maintain a job, and perform a job well after completing the training process. Employability is also the ability to obtain and continue to perform work-related tasks and the self-sufficient ability to realize one's potential through continued employment in the labor market.

The authors of ([Chou et al, 2023](#)) conclude that CIE education integrated with the BIG 6 learning strategy influences students' innovative motivation, creativity and metacognition. For creativity, the transition from innovation to entrepreneurship is a step-by-step process. Creativity, innovation and entrepreneurship refer to three different concepts and behaviors, but from an educational perspective they are inseparable in CIE education. Creativity is a personal quality or ability to create new, useful, valuable, appropriate things. Innovation is the result of further creative practice or commercialization. Creativity and innovation capabilities are essential for businesses to achieve sustainable competitive advantage. Creative people are more prone to entrepreneurial activities, so students need to be actively involved in the learning process and be able to plan, monitor, regulate and control their cognitive processes in relation to their attitudes and behavior. This means that students must have high metacognition skills to actively participate in learning. With CIE training integrated with the BIG 6 learning strategy, the implementation process is as follows: Guide students to identify challenges, search for information, propose solutions to solve problems, study patent laws, find the best solution, evaluate materials and implementation, and collaborate with practitioners.

Other examples of the development of creativity are participation in solving real-world problems ([Weng, 2022](#)), the use of digital technologies ([Tang, 2022](#)), the use of interdisciplinary, project-oriented technologies ([Chang, 2022](#)), the use of joint activities ([Zabrodina, 2021](#)), and the identification of relationships with emotional intelligence ([Razumnikova, Mezentsev, 2020](#)).

Creativity presupposes independence in decision-making, which means another important aspect of teaching and nurturing creative potential in students is participation in student government bodies. For example, at the Financial University there is a practice-oriented student club "Self-government beyond borders", the areas of work of which are related to scientific, educational, project activities, as well as the organization of practice and regional cooperation.

The BIG-6 training model makes it possible to increase the information literacy of students and can be used as a strategy for the training and development of students, allowing them to solve information problems. This model goes well with the CIE Education model (Creativity, Innovation, Entrepreneurship).

The authors developed and tested a methodology for assessing the readiness of teachers to develop the creative potential of young people, which is presented in Appendix A (results of pilot study see ([Gagarina, 2023](#))).

The technique can be used for diagnostic purposes as follows:

- Within one university: to track the dynamics of group processes within a separate unit (annually); to determine the effectiveness of innovations (before and after changes); to assess the quality of the educational environment in different departments. For example, at the Financial University it is possible to include this methodology in the annual survey "Satisfaction with the working conditions of the scientific and teaching staff of the Financial University."

- Within one region: to track the dynamics of the quality of the educational environment within an individual university and compare universities with each other; to determine the effectiveness of innovations for individual universities and compare universities with each other.

- To track the dynamics of the quality of the educational environment within a particular

region and compare regions with each other; to determine the effectiveness of innovations for individual regions and compare regions with each other.

Processing of the results obtained within the framework of this methodology for assessing the teacher's readiness to form the creative potential of youth through educational practices occurs as follows:

1) Answers to open questions 8 and 12 can be processed using the content analysis method and assessed by experts for the presence in the answers of content units that characterize the teacher as focused on the development of the creative potential of youth;

2) Answers to closed questions can be assessed on a R. Likert scale, and the arithmetic mean of the answers to each of the closed questions is calculated. A score above 3 can be interpreted as a tendency towards the teacher's readiness to develop students' creative potential.

In the future, the practical application of the developed methodology will make it possible to collect a database and highlight the sectoral and regional features of the studied parameters of teachers' readiness to develop the creative potential of youth, on the basis of which it will be possible to evaluate specific teachers in contact with the educational environment in which they work.

#### 4. Results

In this block we will focus on the results of the analysis of empirical works on the study of creativity in the field of education, which will allow us to move on to the formulation of our own approach. The article by L. Ibraeva and co-authors (Ibrayeva, 2022) describes teachers' ideas about creativity in Kazakhstan. The authors consider it important to address this aspect of the problem, since these ideas can influence the effective implementation of creativity in the educational group. The problem is that teachers often do not have a clear understanding of what creativity is, and teachers' lack of understanding of creativity means a possible lack of creativity development in the classroom. However, the results of a study conducted with the participation of Kazakh teachers using the method of semi-structured in-depth individual interviews show that regardless of what type of schools the participants work in, and what subjects they teach, the participants' ideas about creativity and creative students coincide not only with the ideas of teachers from other countries, but also with most theories of creativity (Ibrayeva, 2022). Thus, the authors' empirical results (Ibrayeva, 2022) showed that all participants believed that creativity is not a rare phenomenon, but a property of all people, and everyone has creative potential. However, participants from Kazakh and Russian schools also believe that while some aspects of creativity can be developed, others cannot. Whether it's finding solutions to problems, thinking outside the box, or critical thinking, they agree that anyone can develop these skills. Thus, participants had confidence in the creative potential of their students and that creativity is common to all people. Another component of the nature of creativity, based on the conceptual apparatus, is the plasticity of creativity (a person's creativity can increase or even decrease throughout life). All participants shared a common belief that student creativity can be enhanced in classrooms if teachers provide a supportive environment and can also be expressed in any subject.

Other studies point to a connection between arts participation practices and creative development. For example, in one longitudinal study, 240 undergraduate dance students took a test of creativity and flexibility-of-thinking test before and one year after participating in workshops aimed at developing metacognitive skills (May et al., 2020). As a result, it was confirmed that the use of mental imagery as a skill contributes to the growth of flexibility of thinking and general creativity.

Another study (Chacón-López, Maeso-Broncano, 2023) also examined the role of prior artistic participation in creative development, self-esteem, and barriers to creativity. The study also aimed to determine the frequency with which students engaged in artistic activities and to determine which activities were most often performed by men and women. A study to identify differences associated with participation in artistic activities found that the group that carried out such activities received higher scores in narrative, graphic (albeit at the limit of significance) and general creativity. No significant differences were found between the groups in terms of barriers to creativity or self-esteem. In conclusion, the authors recommend participation in artistic activities and note the benefits of creativity, especially in narrative and graphical tasks.

We should also dwell on a project aimed at operationalizing creativity in educational institutions. J. Heard et al. describe creativity as a cognitive process leading to a creative product (Heard et al., 2023). Three aspects were found most useful to include in its design:

- **Problem Definition:** This refers to the initial and potentially iterative process in which a student explores an ill-defined problem he or she is facing in order to give it a more personal definition.

- **Idea Generation:** This refers to the stages of the creative process during which a student engages in divergent and experimental thinking to explore a variety of possible solutions.

- **Quality of ideas:** This refers to the criteria by which students can begin to engage in convergent thinking to evaluate their ideas and arrive at their creative solution. They also provide criteria by which others can judge the creativity of a solution.

Defining a problem involves two dimensions. The first refers to discovery-oriented behavior, which involves students encountering an ill-defined problem and exploring the “territory” of that problem space, as well as the possibilities open to them within it, before proceeding to a solution. The second, problem framing, refers to the learner giving a more personal definition of how he views an ill-defined problem: how he interprets the problem and frames it for himself.

Idea generation includes three additional dimensions. The first two – fluency and flexibility – come directly from a long tradition of divergent thinking tests (see above). Basically, this can be applied to individual and group brainstorming in the classroom to highlight the greater likelihood of generating both original and workable ideas when a larger number and range of ideas are developed. However, creative thinking and divergent thinking are not synonymous, and so the third dimension – experimentation - was designed to focus on the generation of creative ideas after the initial brainstorming stage.

Quality of ideas – includes originality, fitness for purpose, and elaboration.

Because the environment plays an important role in the development of creativity (Amabile, 2018; Csikszentmihalyi, 2014), the authors (Tang et al., 2022) have developed a resource that describes the concept of a supportive environment for creativity, which can be equally applied to both the school as a whole and to a specific classroom. The resource provided a self-assessment tool that school staff could use to evaluate the extent to which their classrooms allowed students to demonstrate and develop creativity. The tool describes four levels (minimal, limited, adequate, and comprehensive) in relation to five factors that influence students' ability to be creative in a school context:

- **Fundamental knowledge:** a sufficient amount of prior knowledge to enable creative processing and consideration of worthy ideas.

- **Valuing creativity:** The value placed on the creative process by explicitly teaching it and rewarding persistence and reflection, as well as allowing trial and error.

- **Task capability:** the nature and focus of the task, including its openness and the amount of time allocated to its completion.

- **Support:** the degree of management involvement, feedback and opportunities to reflect on creative results and ideas.

- **Access to resources:** availability of relevant, useful and sufficient resources.

- We consider this work worth spreading and should be extended to educational institutions in other countries, including Russia.

Thus, the conducted research gives the right to assert that creativity is not a rare phenomenon, but a property of all people. It means that different people to a certain degree are engaged in creative activity or are prone to certain types of it. It is important to note that each individual has a certain creative potential. The creative process itself is plastic. This means that over time, an individual's creativity can decrease or increase under the influence of a number of factors. The factors promoting and hindering creativity could be identified.

## 5. Conclusion

The theoretical review allowed us to come to the conclusion that the development of the assessment methodology was based on the following judgments:

Firstly, creativity is a property of all people, everyone has creative potential, and it can change throughout life, which means the development of creative potential is possible.

Secondly, the development of creativity is possible within any discipline, but different disciplines have different potential for developing creativity.

Thirdly, the development of students' creative potential is associated with the individual characteristics of the teacher.



These three judgments were a prerequisite for including in the methodology questions related to socio-demographic (gender, age, education, experience), professional (discipline taught, opportunity to participate in interdisciplinary courses) and individual personal characteristics (for example, self-assessment of one's own creativity). In order to be able to make comparisons at the regional level, we also included questions about federal districts and types of localities.

Fourthly, since at the individual level creativity presupposes (1) knowledge and skills in the subject area, (2) processes associated with creativity, and (3) motivation towards the goal, the next set of questions is related to the readiness of teachers to work towards the development of these elements.

To what extent do you consider it is your goal to develop students' knowledge and skills in the subject area? Rate it on a 5-point Likert-scale.

To what extent do you consider student development of following characteristics as your personal goal (Rate on a 5-point Likert-scale.):

- general intelligence
- unconventional thinking
- deep interest in professional activities

To what extent do you consider it is your goal to develop a special reward system for completed tasks? (Rate it on a 5-point scale.)

Fifthly, since the "Big Six" has proved its reliability as a way to develop creativity, the questionnaire should include questions on awareness of all six stages and use of special techniques when working with information: 1. Statement of the problem; 2. Information search strategies; 3. Location and access to information; 4. Use of information; 5. Synthesis; 6. Evaluation.

Sixthly, there are many specific techniques used to develop creativity and determined by the specific content of the activity. Therefore, it is necessary to include questions about the extent to which respondents use particular techniques, such as solving real problems, digital technologies, cases, analysis of media texts, etc.

Seventh, based on the work of J. Heard et al. (Heard et al., 2023), what is important for the development of creativity is (1) the amount of prior knowledge acquired to enable creative processing and consideration of worthy ideas; (2) the value placed on the creative process by explicitly teaching it and rewarding persistence, trial and error, and reflection; (3) the nature and focus of the task, including its openness and the amount of time allocated to its completion; (4) degree of management support, feedback, and opportunities to reflect on creative results and ideas; (5) availability of relevant, useful and sufficient resources. These indicators should also be included in the questionnaire.

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## References

- Amabile, 2018 – Amabile, T.M. (2018). Creativity in context: Update to the social psychology of creativity. N.Y. and London: Routledge.
- Azaryahu, 2023 – Azaryahu, L., Broza, O., Cohen, S., Hershkovitz, S., Adi-Japha, E. (2023) Development of creative thinking patterns via math and music. *Thinking Skills and Creativity*. 47:101196. <https://doi.org/10.1016/j.tsc.2022.101196>
- Bajwa, 2022 – Bajwa, S., Khan, M.A., Waheed, S. (2022). Role of social media in perspective of media information literacy during pandemic Covid-19. *International Journal of Media and Information Literacy*. 7(2): 305-314. DOI: 10.13187/ijmil.2022.2.305
- Bransford, 2000 – Bransford, J.D., Brown, A.L., Cocking, R.R. (eds.) How people learn: Brain, mind, experience and school (Expanded Edition). (200). Washington, DC: The National Academies Press. 374 p. <https://doi.org/10.17226/9853>
- Chacón-López, Maeso-Broncano, 2023 – Chacón-López, H., Maeso-Broncano, A. (2023). Creative development, self-esteem and barriers to creativity in university students of education according to their participation in artistic activities. *Thinking Skills and Creativity*. 48: 101270. <https://doi.org/10.1016/j.tsc.2023.101270>
- Chang, 2022 – Chang, T.S., Wang, H.-C., Haynes, A.M., Song, M.-M., Lai, S.-Y., Hsieh, S.-H. (2022). Enhancing student creativity through an interdisciplinary, project-oriented problem-based

learning undergraduate curricula. *Thinking Skills and Creativity*. 46: 101173. DOI: <https://doi.org/10.1016/j.tsc.2022.101173>

**Chi, 2006** – Chi, M.T.H. (2006). Two approaches to the study of experts' characteristics. *The Cambridge handbook of expertise and expert performance*: 21-30.

**Chicherina, 2012** – Chicherina, N.V. (2012). Media literacy as a key competence of a modern specialist: structure and content. *Bulletin of the Northern (Arctic) Federal University. Series: Humanities and Social Sciences*. 1: 152-158.

**Chou et al, 2023** – Chou, C.-M., Shen, T.C., Shen, T.C., Shen, C.-H. (2023). The impact of CIE education integrated with the BIG 6 teaching strategy on students' innovative motivation, creativity, metacognition, and self-perceived employability. *Thinking Skills and Creativity*. 48: 101287. <https://doi.org/10.1016/j.tsc.2023.101287>

**Convergent...** – Convergent thinking. [Electronic resource]. URL: <https://ezpro.fa.ru:2052/topics/psychology/convergent-thinking>

**Csikszentmihalyi, 2014** – Csikszentmihalyi, M. (2014). Society, culture, and person: A systems view of creativity. Springer, Netherlands: 47-61.

**Ecosystem...** – Ecosystem of universities: transformation of the Russian education system. Moscow 2023.

**Gagarina, 2023** – Gagarina, M.A. (2023). Readiness of university teachers with different work experience to develop the creativity of students. *World of Science. Pedagogy and psychology*. 11(4): 20PSMN423 [Electronic resource]. URL: <https://mir-nauki.com/PDF/20PSMN423.pdf>

**Gube, Lajoie, 2020** – Gube, M., Lajoie, S. (2020). Adaptive expertise and creative thinking: A synthetic review and implications for practice. *Thinking Skills and Creativity*. 35: 100630. DOI: <https://doi.org/10.1016/j.tsc.2020.100630>

**Heard et al., 2023** – Heard, J., Krstic, S., Richardson, S. (2023). Evidencing creativity in educational settings. *Journal of Creativity*. 33(1): 100046. <https://doi.org/10.1016/j.yjoc.2023.100046>

**Ibrayeva et al., 2022** – Ibrayeva, L., Helmer, J., CohenMiller, A. (2022). Thinking outside the Yurt: Kazakhstani upper secondary school teachers' beliefs about the nature of creativity and creative students. *Thinking Skills and Creativity*. 46: 101176. DOI: <https://doi.org/10.1016/j.tsc.2022.101176>

**Kaiser, 2018** – Kaiser, K. (2016). 20 Things only highly creative people would understand / Lifehack. [Electronic resource]. URL: <https://www.lifehack.org/articles/communication/20-things-remember-you-love-highly-creative-person.html>

**Lajoie, 2003** – Lajoie, S.P. (2003). Transitions and trajectories for studies of expertise. *Educational Researcher*. 32(8): 21-25. [Electronic resource]. URL: <https://www.jstor.org/stable/3700082>

**May et al., 2020** – May, J., Redding, E., Whatley, S., Łuczniak, K., Clements, L., Weber, R., Sikorski, J., Sara Reed, S. (2020). Enhancing creativity by training metacognitive skills in mental imagery. *Thinking Skills and Creativity*. 38: 100739. <https://doi.org/10.1016/j.tsc.2020.100739>

**Murillo-Zamarano et al., 2023** – Murillo-Zamorano, L.R., López-Sánchez, J.Á., López-Rey, M.J., Bueno-Muñoz, C. (2023). Gamification in higher education: The ECon+ star battles. *Computers & Education*. 194: 104699. <https://doi.org/10.1016/j.compedu.2022.104699>

**Prakhov, 2023** – Prakhov, I. (2023). Indicators of higher education quality and salaries of university graduates in Russia. *International Journal of Educational Development*. 99: 102771. DOI: <https://doi.org/10.1016/j.ijedudev.2023.102771>

**Quadlin et al., 2023** – Quadlin, N., VanHewelen, T., Ahearn, C.E. (2023). Higher education and high-wage gender inequality. *Social Science Research*. 112: 102873. DOI: <https://doi.org/10.1016/j.ssresearch.2023.102873>

**Razumnikova, Mezentsev, 2020** – Razumnikova, O.M., Mezentsev, Yu.A. (2020). Correlation of creativity, emotional and general intelligence in the academic performance of students. *Questions of psychology*. 2: 119-128.

**Runco, 2011** – Runco, M.A. (2011). Divergent Thinking. *Encyclopedia of Creativity*. [Electronic resource]. URL: <https://www.sciencedirect.com/referencework/9780123750389/encyclopedia-of-creativity>

**Runco, Jaeger, 2012** – Runco, M.A., Jaeger, G.J. (2012). The standard definition of creativity. *Creativity Research Journal*. 24(1): 92-96.

**Scott, 2004** – Scott, G., Leritz, L.E., Mumford, M.D. (2004). The effectiveness of creativity training: A quantitative review. *Creativity Research Journal*. 16: 361-388. DOI: 10.1080/10400410409534549

**Shumakova, 2021** – *Shumakova, N.B.* (2021). Creative potential and its measurement in modern foreign research. *Modern foreign psychology*. 10(4): 8-16. DOI: <https://doi.org/10.17759/jmfp.2021100401>

**Sviderskaya et al., 2007** – *Sviderskaya, N.E., Antonov, A.G., Butneva, L.S.* (2007). Comparative analysis of the spatial organization of the EEG on models of divergent and convergent nonverbal thinking. *Journal of Higher Nervous Activity*. 57(2): 144-154.

**Tang, 2022** – *Tang, C., Mao, S., Naumann, S.E., Xing, Z.* (2022) Improving student creativity through digital technology products: A literature review. *Thinking Skills and Creativity*. 44: 101032. DOI: <https://doi.org/10.1016/j.tsc.2022.101032>

**Weng, 2022** – *Weng X., Chiu T.K.F., Tsang C.C.* (2022). Promoting student creativity and entrepreneurship through real-world problem-based maker education. *Thinking Skills and Creativity*. 45: 101046. DOI: <https://doi.org/10.1016/j.tsc.2022.101046>

**Yeh, 2011** – *Yeh, Y.-C.* (2011). Encyclopedia of Creativity [Electronic resource]. URL: <https://www.sciencedirect.com/referencework/9780123750389/encyclopedia-of-creativity>

**Zabrodina, 2021** – *Zabrodina, T.I., Kurina, V.A., Muryasova, L.F., Shirokova, S.Yu.* (2021). Joint activity and development of the creative potential of the personality of a future specialist. *Perspectives of science and education*. 5(53): 139-153.

## Appendix

*Questionnaire for assessing the readiness of teachers to develop the creative potential of students*

Dear colleague! We invite you to take part in a study of teachers' readiness to shape the creative potential of young people. Your answers will allow us to see problem areas, as well as opportunities and prospects for increasing the efficiency of the educational process. The research is conducted anonymously and its results will be published only in aggregate form (*Full form of Inform Consent depends on special task and requirements of a particular Ethical Committee of the Educational Institution*)

1. We would like to ask a few questions about you. Your gender (Single selection)

male  female

2. Your age (total number of years) (Free answer)

3. What is your highest degree of education? (Single selection)

bachelor's degree  specialist  master's degree  two (or more) higher education degrees  PhD  DSc  other

4. Indicate your work experience (full number of years) (Free answer)

5. Specify the direction of the disciplines taught (Drop-down list)

Management and Economics  
 Humanities and Social Sciences  
 IT  
 Technics and Technology  
 Media, Design and Architecture  
 Natural Sciences  
 Security and Military Affairs  
 Art  
 Medicine and Healthcare

6. In which federal district of the Russian Federation do you live? (Single selection)

Central Federal District  
 Northwestern Federal District  
 Southern Federal District

- \_\_\_ North Caucasus Federal District
- \_\_\_ Volga Federal District
- \_\_\_ Ural federal district
- \_\_\_ Siberian Federal District
- \_\_\_ Far Eastern Federal District
- \_\_\_ Difficult to answer

7. How many inhabitants are there in the city where you live? (Drop-down list)

- \_\_\_ More than 1 million
- \_\_\_ From 500 thousand to 1 million
- \_\_\_ From 250 to 500 thousand
- \_\_\_ From 100 to 250 thousand
- \_\_\_ Less than 100 thousand
- \_\_\_ Difficult to answer

8. Do you consider yourself a creative person (slider, not creative on the left, creative on the right)

9. The next block of questions is dedicated to your teaching activities.

To what extent, in your opinion, does the teacher contribute to the development of the student's creative potential (rate on a 5-point scale)

1. Doesn't help at all
2. Doesn't help
3. Sometimes it helps, sometimes it doesn't
4. Contributes
5. Contributes greatly

10. To what extent do you agree that the teacher should develop special tasks aimed at developing the following competencies in students (matrix)

	1 – completely disagree	2 – rather disagree	3 – neither one nor the other / difficult to say	4 – rather agree	5 – completely agree
Domain-specific knowledge and skills					
General intelligence					
Thinking outside the box					
Deep interest in professional activities					

11. To what extent do you use tasks aimed at (matrix) when teaching your discipline?

	1 – I don't use it at all	2 – I don't use it	3 – neither one nor the other / hard to say	4 – I use it	5 – I use it all the time
Ability to formulate a problem					
Finding relevant sources of information to prepare a solution					
Selecting the necessary information from the source					
Interpretation of information from sources: assessing the reliability of information content					

Process information from multiple data sources and display it in an integrated form					
Evaluation/checking of the work done for compliance with the task and conclusion on the effectiveness of the process of solving information problems					

12. What forms of developing the creative potential of young people do you consider the most effective? (free answer)

13. When teaching information literacy skills to students, do you address social media content? If the answer is yes, please list which ones (free answer)

14. To what extent have your educational institution created the following conditions for the development of creative potential (matrix)

	1 – completely absent	2 – absent	3 – neither one nor the other/difficult to say	4 – present	5 – fully present
Students' Fundamental Knowledge: Sufficient prior knowledge to enable creative processing and consideration of worthy ideas.					
The value placed on the creative process by teaching teachers new methods, encouraging persistence and reasoning in learning new things, allowing trial and error; organization of discussion clubs.					
Opportunities within the discipline: the nature and focus of the subject, the number of hours per discipline, the presence of a creative task, laboratory work, hours for checking individual assignments, etc.					
Support: degree of management involvement, availability of feedback and opportunities to reflect on creative results and ideas.					
Access to resources: availability of relevant, useful and sufficient resources (information, technical).					