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METHODS OF DEVELOPING CREATIVITY IN THE PREPARATION OF FUTURE BIOLOGY TEACHERS FOR THE INTERNATIONAL ASSESSMENT STUDY.

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Abstract:

In the article, in order to develop students' creative abilities in preparation for the PISA International Assessment Program, future biology teachers should be taught the meaning and importance of the concept of "creativity" and "creative pedagogy", the methodology of creativity development, as well as the types of competences that evaluate creative thinking and creative the importance of developing and regularly using tasks related to the subject in class and extracurricular activities of the methodology of working with tasks related to expression.

Keywords: PISA, "creativity", "creative pedagogy", innovation, intellectual creativity, interactive teaching method, "openness to experience", "openness to learning", written expression, visual expression.

ENTER

"IMAGINATION IS MORE IMPORTANT THAN KNOWLEDGE" ALBERT EINSTEIN

Today we often meet the concepts of creativity and pedagogical creativity. What is creativity itself ?

Creativity (lat., ing. "create" - creation, "creative" - creator) is the creative ability of a person to produce innovative ideas that did not exist before, embodies creativity, creativity

Creativity is the ability of students to effectively express their imaginations, form, evaluate and improve ideas that encourage learning, find original and effective solutions

Creativity in education is the unconventional approach of the pedagogue to the course of the lesson, the ability to constantly work on himself and introduce new elements to his training, to increase the creative thinking of students, to teach his students the skills to get out of existing problematic situations. is the formation [5, 56-b]

If intellectual creativity is characterized by the creation of new ideas, discoveries, pedagogical creativity is of great importance in the development of the student's personality and the effectiveness of the pedagogical process.

LITERATURE ANALYSIS AND METHODS

D. Gilford, the founder of creativity studies, proved that creativity – the effective solution of problems depends not on the knowledge and skills measured by existing intellectual tests, but on the individual ability to quickly apply the information presented to solve the task in different ways.

In her research, G.Ibragimova studied the integrated methodical system of developing creative abilities in an interactive educational environment, the content of the reproductive, creative and innovative stages, as well as the prognostic and qualitative methods of evaluating the effectiveness of the process.

In A. Aripjanova's research, studying the methods of developing the creative potential of pedagogues in the conditions of education informatization, it was found that creativity is an individual trait of a person, that creative potential cannot be formed without a personal approach, because it is a person-oriented approach that gives the pedagogue personality himself learned that it allows to develop [1, 7-b]

In her research, D. Mahmudova developed a methodology for developing students' creative activity based on a problem-based approach.

In her research, O. Tolipova studied the pedagogical conditions for the development of creativity in students (integrated lessons, special methods and tools of art pedagogy). According to VAMolyako, there are seven signs of student creativity: uniqueness, heuristics, fantasy, activity, concentration, independence of thoughts, accuracy, sensitivity. A creative specialist must have the following qualities: ingenuity, self-criticism, critical attitude, flexibility of thinking, courage and bravery, enthusiasm, persistence, determination to finish the work, goal orientation. [8, 8-b]

Many authors (A. Verbitsky, V. Druzhinin, A. Matyushkin, R. Sunnatova, etc.) [1]have studied that the period of development of creativity is in a very active position between 16-20 years of age, while B. Khodjayorova and studied the place of the teacher in social psychological processes during the transition from primary to upper class and early adolescence in 5-6th grade students of general education schools based on an integrative approach. The importance of creating a cultural-educational environment that helps to form the creative potential of students and organize the cultural activities of students and prepare teachers for this process, the importance of improving the teacher based on a creative approach in the organization of educational activities, spiritual-educational events and extracurricular activities in the socialization of students was studied. [3, 12p]

RESULTS

As we want to join the ranks of the world's developed countries and change our lives, it is important to develop innovative activities in the country and apply it to all areas [2]. The only requirement for this is to have a creative and innovative mindset. While creativity is about "imagination," innovation is about "implementation."

KEY DIFFERENCES BETWEEN CREATIVITY AND INNOVATION :

1. Creativity is the quality of thinking about new ideas and turning them into reality. Creativity is the act of putting ideas into practice.
2. Creativity is a creative process, unlike innovation, it is a productive process.
3. Creativity can never be measured, but innovation can be.
4. Creativity is the production of new and unique ideas. Rather, innovation is about bringing something better to the market.

requires money and resources does _

6. There is no risk in creativity, and risk is always associated with innovation.

COMMONALITY BETWEEN CREATIVITY AND INNOVATION :

1. Creativity and innovation reflect newness in itself;
2. Both are the result of intellectual activity;
3. Creativity and innovation are manifested in social development and lead to development;
4. Creativity and innovation lead to qualitative and quantitative changes in all areas of society.
5. Creativity and innovation are in a dialectical relationship and require each other . [5, 75p]

Societies and organizations around the world increasingly need innovative knowledge and creativity to solve problems, which in turn reinforces the importance of teamwork, innovation and 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 need to have, a skill that will help them adapt to a world that is constantly and rapidly changing and that requires workers with "21st century" skills that go beyond simple literacy.[3]

Pedagogical creativity is an important quality in the successful organization and implementation of the pedagogical process, which is manifested as the teacher's cognitive activity, non-standard way of thinking, independence and acting skills.

A Tusi teacher's speech can never and anywhere be poisonous, rude or ineffective, the teacher's lack of self-control during the lesson can spoil the work. The teacher explains that it is useful for the student to give examples from the thoughts of our ancestors in his speech [4].

Such requirements of the thinker to the teacher are the basis of pedagogical creativity - a unique expression of pedagogical communication and openness to communication.

"Creative pedagogy" must be able to guarantee the following two conditions:

1) attracting the attention of students who have low mastery of academic subjects and who consider their study boring by teachers to master the basics of science;

2) to provide teachers with the opportunity to effectively use them in the audience by recommending strategies and tools that serve to stimulate creative thinking and creative activity results in students. [7, p. 58]

In fact, if the teacher is unable to skillfully organize these two processes, he will not be able to develop the existing creativity in students, on the contrary, it will cause students to lose their ability, creativity and creative characteristics.

In order for the pedagogue to have the potential for creativity, he should pay attention to the following in his professional activities:

- creative approach to professional activity;
- show activity in creating new ideas;

[1]G.Ibragimova DOCTOR OF PHILOSOPHY (PhD) DISSERTATION "DEVELOPMENT OF STUDENTS' CREATIVE SKILLS BASED ON INTERACTIVE TEACHING METHODS AND TECHNOLOGIES". 2017 page 156 page 145

[2]http://uza.uz/ru/politics/prezidenta-respubliki-uzbekistan-shavkata-mirziyeev 25.01.2020. 76

[3] Lucas, B. and E. Spencer (2017), Teaching Creative Thinking: Developing Learners Who Generate Ideas and Can Think Critically., Crown House Publishing, https://bookshop.canterbury.ac.uk/Teaching-CreativeThinking-Developing-learners -who- generate-ideas-and-can-thinkcritically_9781785832369 (accessed on 26 March 2018

[4] Khairullaev M. _ Spirituality stars _ - T .: A. _ Qadiri in the name of People legacy publishing house , 1999. - 397 p .

- independent study of advanced pedagogical achievements and experiences;
- sharing ideas with colleagues about pedagogical achievements
Creativity of future teachers, as in any professional
- creative approach to professional activity;
- show activity in creating new ideas;
- independent study of advanced pedagogical achievements and experiences;
- sharing ideas with colleagues about pedagogical achievements
- speed and flexibility of thinking;
- the ability to create new ideas;
- not thinking in one way;
- originality; - initiative;
- tolerance of uncertainty;
- in order to have the ability to be intelligent, the foundation is laid in the student years and it is consistently developed in the organization of professional activity. It is important for the pedagogue to direct himself to creative activity and be able to organize this activity effectively. The development of students' creative thinking can be carried out in all subjects. Creative thinking is blindly memorizing lesson topics, short answering based on short-term memory, narrating the text verbatim - stops the student from thinking, but instead develops the skills of analyzing with broad reasoning, substantiating information, identifying problems, offering different approaches to problem solutions formation and development is required.

According to Warhuus et al., as a result of the interaction of creative thinking, groups can offer new solutions to complex problems that are beyond the capabilities of individuals.[5]

Contemporary research increasingly views creative thinking as a collaborative creative thinking process rather than an individual endeavor.

According to research on collaborative creative thinking, group members engage in purposeful, opportunistically emergent, and disorderly complex processes that set a goal and monitor its achievement, with different group members taking group leadership based on their strengths. In particular, the ability to participate in the processes conducted by the negotiation method prepares the ground for the creation of new ideas [6]. As a result of collaboration, activities are linked to idea generation and improvement, ideas are corrected, and workarounds are discovered.

The ability to work collaboratively is also an important part of knowledge creation in an educational context. School serves as a favorable ground for students to discover the ideas of others, create new ideas based on them, and thereby create new knowledge in cooperation. Students learn to enjoy the ideas of others, co-authorship, and collaborative activities.

According to G.Ibragimova's research, it is effective to use interactive teaching methods and technologies to develop students' creative abilities in educational and cognitive activities, based on the needs of the learner to activate the cognitive activity of interactive teaching methods (IO'M). used the teaching method based on subject-subject relations, organized on the basis of mutual cooperation.

In order to develop students' creative qualities, the teacher must first be able to think creatively. It is of great importance to train future biology teachers as competitive personnel in the labor market, to make their important contribution to the development of society and economy, and to feel it.

Students' creative thinking skills were assessed for the first time in the PISA 2022 study in today's international assessment research.

The term creative thinking is the competence of students to express their ideas in an effective way, to actively participate in the formation, evaluation and improvement of ideas that stimulate learning, find original and effective solutions.

"Creatives" are passionate about thinking and thus, together, "openness": that is, they have both "openness to experience" and "openness to learning" (although both options seem to involve a greater "openness" factor) shows that there is [7]a more precise approach to the issue, the concept of "openness to experience" refers to the ability of a person to accept new ideas, imagination and fantasies.

Students with creative thinking:
- of other students expresses ideas that have not occurred to him;
- chooses a unique style of self-expression;
- sometimes asks unrelated or unusual questions;
- enjoys tasks whose solution is open;
- prefers to discuss ideas based on clear evidence;
- chooses an unconventional approach to finding a solution to a problem.

[5]Warhus, J. et al. (2017), "From I to We: collaboration in entrepreneurship education and learning?" , Education + Training, Vol. 59/3, pp. 234-249, http://dx.doi.org/10.1108/ET-08- 2015-0077.

[6]Tsoukas, H. (2009), «A dialogical approach to the creation of new knowledge in organizations», Organization Science, Vol. 20/6, pp. 941-957, http://dx.doi.org/10.1287/ orsc.1090.0435

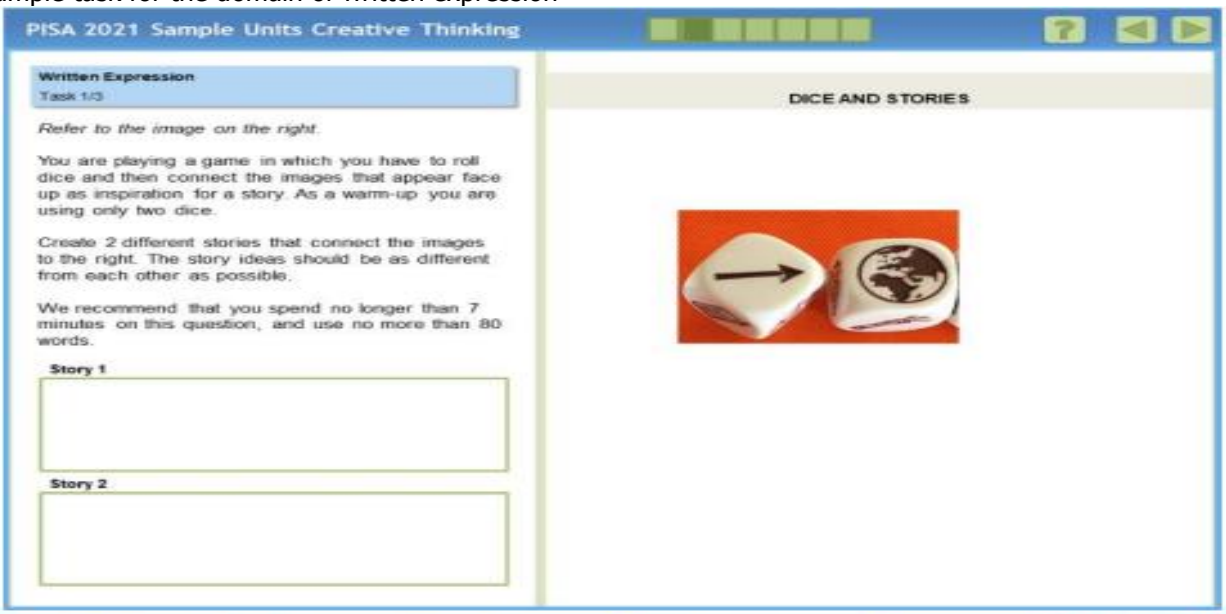
[7]Amabile, T. (2012), "Componential theory of creativity", No. 12-096, Harvard Business School, http://www.hbs.edu/faculty/Publication%20Files/12-096.pdf (accessed on 28 March 2018).

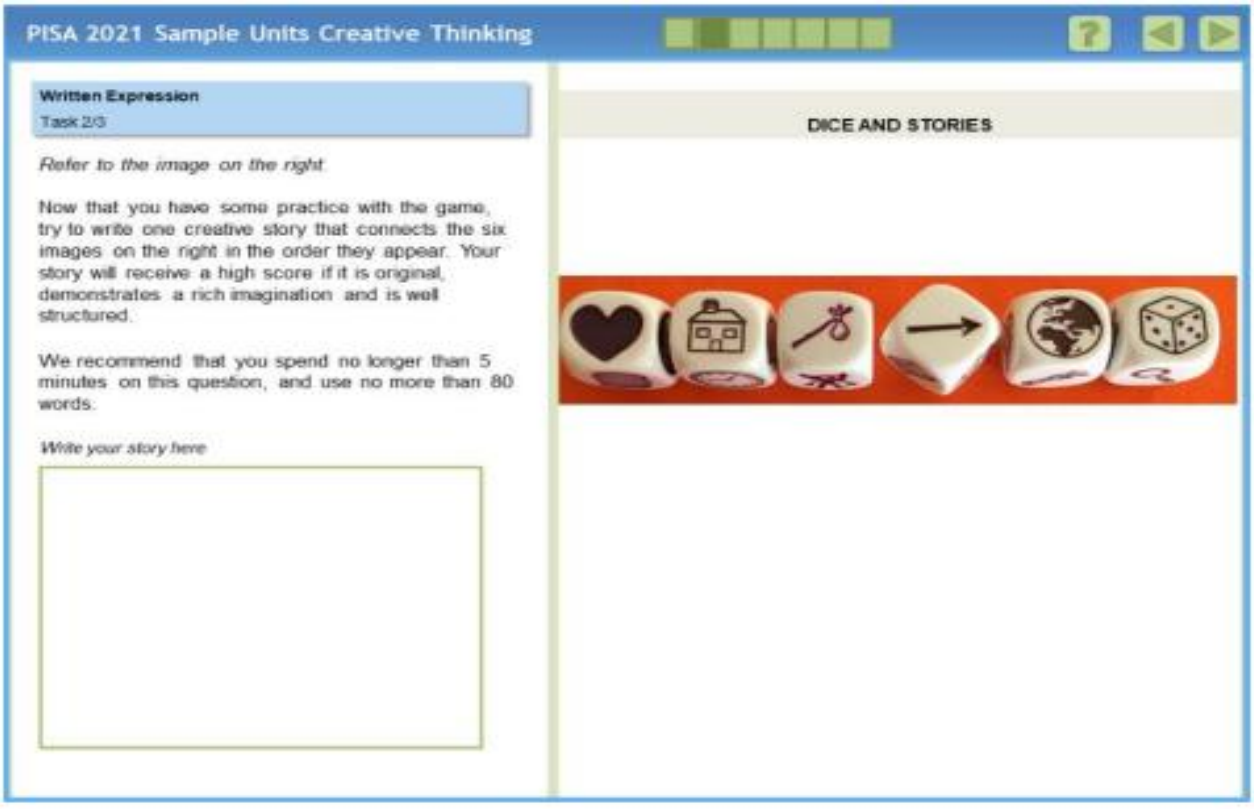
The main factors of creativity are the persistence and perseverance needed to overcome any difficulties on the way to achieving the goal, so that a person can continue to work towards the goal he has set for himself despite any difficulties. He believes that one of the leading characteristics characteristic of creative people is patience. The ability to focus all the energy on a certain thing during that period and continue to fight with patience despite failure is also important in the formation of creativity.

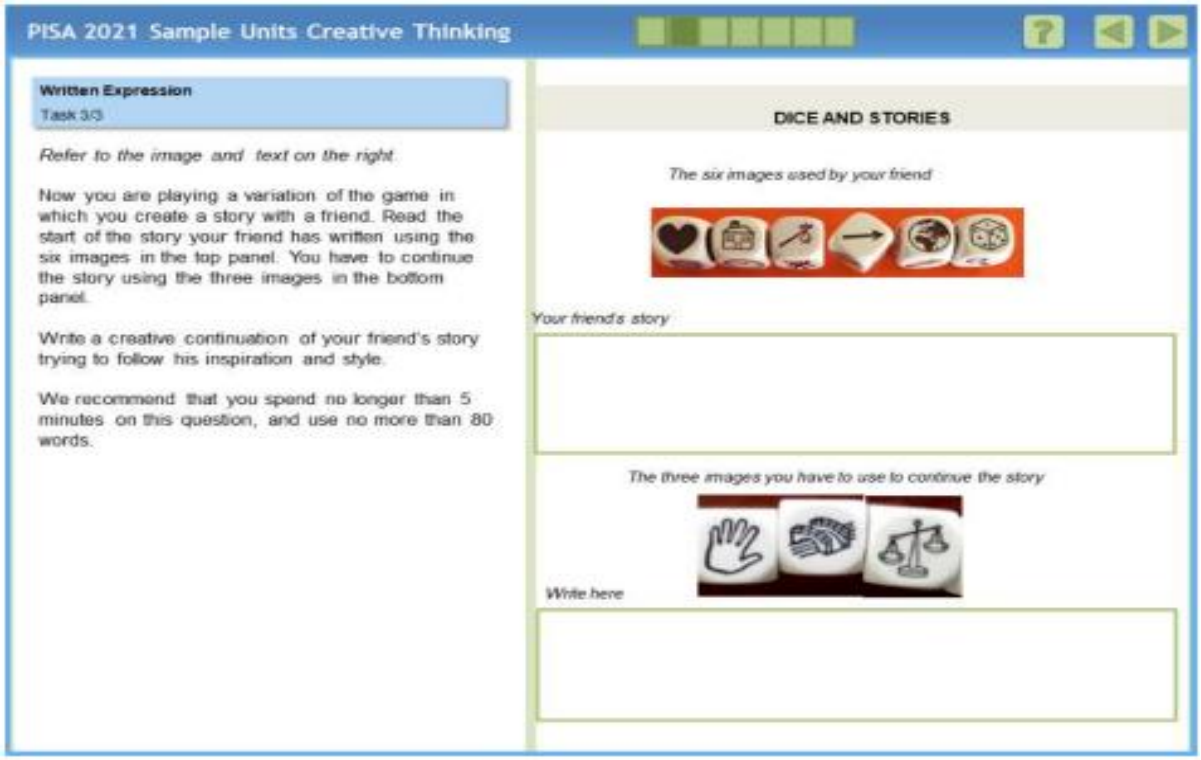
The distribution of tasks in the assessment of creative thinking in the PISA study is as follows:

Thematic content area	Domain	Assignments are in percent
Creative expression	Written expression	25%
	Visual expression	25%
Knowledge creation and problem solving	Solving a social problem	25%
	Scientific problem solving	25%

Sample task for the domain of written expression







In the first task, the student must creatively think and create a different story, expressing different ideas, based on the images in the 2 short stories, within the given time and with the specified number of words. This task provides information on the student's ability to develop different ideas. Variants of the template task may use a different stimulus type (eg, image, photo, interactive film), where stimulus characteristics such as the abstractness of the film or image or the contextual familiarity of the image are likely to influence task difficulty. In this task, ideas were considered eligible if they were reflected in a story idea (ie, one or more sentences that revealed a possible topic) and if they related in one way or another to both images presented in the task. Students demonstrate that they can come up with a variety of ideas by coming up with suitable stories that are sufficiently different from each other.

The second task is to collect information on the aspect of creative idea development. Students will have to write a creative story related to six images. In this task, a story idea (ie, one or more sentences about its likely content) and specific reference to successive images in that sequence represent relevant ideas. To judge originality, the coder refers to the appropriate section of the coding manual to determine whether the student's response is unusual in theme or approach. Examples of typical answers for this task might be: 1) the story is about a heart on a journey; 2) the story is about people who left their homes for love; 3) the story is about a person who did not find happiness at home and intends to leave. A reader's response can be considered original even if it fits a typical story theme, if the story is approached in an unusual way (contains unusual elements or unexpected twists in the content).

In the third task, the student is given additional information and asked to continue his friend's story. This assignment gives an idea of the aspect of evaluating and refining an idea. If the continuation of the story provided by the learner is consistent (ie, connects with the three suggested additional images and provides 50 coherent evidence of the story that the friend started) and describes an unconventional continuation of the subject, the the student receives full credit. As in the second task, the student's answer may be unconventional. If a student's story is relevant in only one case, they will receive partial credit .

The rest of the visual expression, social problem solving, and scientific problem solving assessments can also be found through sample assignments.

DISCUSSION

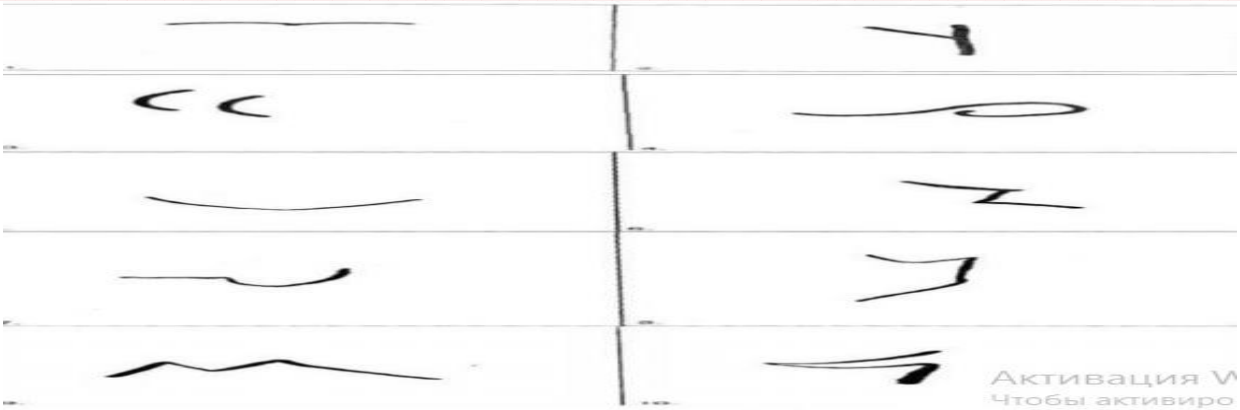
In order to develop the creativity of the future biology teacher in preparation for the International Assessment Programs, it is important to have the skills and competencies of a creative approach in the development of educational tasks for program-based lectures, practicals, seminars and laboratory sessions.

For this, pedagogues need to organize systematic, consistent practical actions to develop their creativity.

We will dwell on some of them below.

1. Transferring textual information into graphic form . Textual information, especially large textual information, is difficult for students to accept. International assessment tasks also require the conversion of textual information into graphic form. When transferring educational information to a graphic form , it is appropriate to express the data in the form of a model, graph, scheme, table, diagram, image, cluster , mathematical, physical, geometric form. This type of information is effectively received by students and develops skills and competence in working with graphic forms.

2. Work with special tests. Using EPTorrence's "Unfinished Pictures" test gives effective results. This test consists of ambiguous images with the following lines, and students are asked to complete them:



As a result of the work done, it shows how creative the students are and how rich their imagination is.

3. Use of interactive methods . Working with interactive methods (strategy, graphic organizer) in classes creates an opportunity for students to acquire educational information systematically and holistically. In addition, with the help of interactive methods, students will be able to acquire skills and abilities such as analyzing and synthesizing knowledge, systematizing important concepts, clearly expressing the general essence of objects, processes, activities, events, events when working with educational information. .

4. Determination of types of training tasks and types of training tasks for training activities. Students studying at Pedagogical Higher Education Institution should have the skills and abilities to correctly formulate educational assignments. In the formation of educational tasks, attention is paid to the following:

1. Ability to determine the level of complexity of educational tasks.
2. Forming a system of educational tasks in accordance with the purpose of the lesson

5. Preparation of work papers for educational assignments . Completion of educational tasks based on worksheets makes it possible to speed up this process, facilitate students' activities and, most importantly, save time as much as possible. In the experience of leading foreign countries, it is also possible to create worksheets for the process of working with educational tasks and train them. special attention is paid to preparation for classes.

6. Based on a creative approach, preparation of test assignments in academic subjects , formation of a set of cases and graded tests. In modern education, it is becoming more and more important not to give ready-made knowledge to students, but to direct them to independent acquisition of knowledge.

SUMMARY

Based on the development of students' creativity skills, it is desirable to pay special attention to the development of their specialized, i.e., pedagogical creativity competence, to make future teachers widely use modern information and communication technologies, innovative strategies, interactive educational methods and technologies. Only for this having the characteristics of perseverance, thirst for knowledge, healthy thinking, being able to go beyond the limits of consciousness, striving for innovation, inquisitiveness characteristic of creative people, generating very important creative ideas not only individually, but also with the methods of cooperative thinking and joint activities will

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