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# DEVELOPMENT OF STUDENTS' COGNITIVE ACTIVITY

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# РОЗВИТОК ПІЗНАВАЛЬНОЇ АКТИВНОСТІ СТУДЕНТІВ

**Abstract.** It has been investigated different approaches to the definition of the concepts of "cognitive activity", "cognitive functioning" and "cognitive autonomy". Their comparisons have also been made. As a result we have found that cognitive function as a form of mental activity is aimed at cognition, perception and thinking of the learning subject. Cognitive activity is characterized as a personality trait that manifests itself in its relation to the process of cognition, readiness and desire for cognitive activity. It is proved that cognitive autonomy is a quality of the personality, which is inherent in the desire and ability without the help (independently) to acquire the necessary knowledge and skills, to solve tasks.

The means, methods and conditions for improvement of students' cognitive activity are determined i.e. a game as a way of activating cognitive functioning, project method, cognitive tasks, modeling, independent work, vocabulary work, web quest technology, project activity. It is concluded that all of them are focused on the students' creative work, on the avoiding of the standard form of conducting classes and changing of thinking and participation of both the student and the teacher. It is noted the essential role of the teacher in the process of using such activities while working with students. The contemplative and guiding functions of the teacher in the learning process are distinguished. The importance of creating a work atmosphere comfortable for all participants is emphasized.

Emphasis is placed on the fact that cognitive activity begins with activity, independence, initiative, desire to know more, go beyond what is already known. It is noted that the relationship between the student and the teacher has moved to the subject-subjective level, which enables the student to independently plan his/her activity, predict the results, be responsible for the final result of learning i.e. knowledge acquisition, comprehensive development and ability to work.

**Key words:** cognitive activity; project activity; personal-oriented learning; independent work; interactive technologies; educational process.

**Анотація.** Досліджено різні підходи до визначення понять «пізнавальна активність», «пізнавальна діяльність» та «пізнавальна самостійність», здійснено їх порівняння. З'ясовано, що пізнавальна діяльність як форма психічної активності спрямована на пізнання, сприйняття та мислення суб'єкта навчання. Охарактеризовано пізнавальну активність як рису особистості, що виявляється в її ставленні до процесу пізнання, готовності та прагненні до пізнавальної діяльності. Доведено, що пізнавальна самостійність є якістю особистості, якій притаманне прагнення та вміння без допомоги (самостійно) отримувати необхідні знання та навички, розв'язувати завдання.

Визначено засоби, способи й умови покращення пізнавальної активності студентів, такі, як: гра як спосіб активізації пізнавальної діяльності, метод проєктів, пізнавальні завдання, моделювання, самостійна робота, словникова робота, технологія веб-квест, проєктна діяльність. Зроблено висновок, що всі вони орієнтовані на творчу роботу студента, на відхід від стандартної форми проведення заняття, на зміну мислення та участі як студента, так і викладача. Відзначено роль викладача в процесі використання таких активностей під час роботи зі студентами. Виокремлено споглядаючу та скеровуючу функції педагога в процесі навчання. Зосереджено увагу на важливості створення робочої атмосфери, комфортної для всіх учасників.

Акцентовано увагу на тому, що пізнавальна активність розпочинається з діяльності, самостійності, ініціативності, бажання знати більше, виходити за рамки вже відомого. Відзначено, що відносини між студентом і викладачем перейшли на суб'єктно-суб'єктний рівень, що дає змогу студенту самостійно планувати свою діяльність, передбачити результати, бути відповідальним за кінцевий результат навчання – отримання знань, всебічний розвиток та вміння працювати.

**Ключові слова:** пізнавальна активність; проєктна діяльність; особистісно-орієнтоване навчання; самостійна робота; інтерактивні технології; навчальний процес.

**Introduction.** Nowadays transformational processes create the need for adaptation of personality to change, self-education, application of acquired knowledge in practice, information literacy. The ability to think critically, creatively, strive for self-improvement are necessary qualities of a specialist in the 21st century. That is why, the main task of the teacher is to encourage

the student to be independent, to develop his cognitive functions, motivation for action and so on.

The modern education system is increasingly introducing a competent approach to learning. In fact, competence is the ability of a person in the learning process to acquire knowledge, experience, values and attitudes that should be applied holistically in practice.

The effectiveness of educational and cognitive functioning depends on the psychological preparation of the student, which involves awareness of the purpose of learning, which is a significant factor for activity, the desire to study, the right level of knowledge, the ability to focus, the willingness to act. The motive for learning is an internal factor that makes the student learn, influences his attitude to learning activities, affects the quality of acquired knowledge. The motive may be the need, the value, the conviction, the ideal that is the driving force behind the acquisition of knowledge.

Ancient Greek philosophers such as Socrates, Plato, Aristotle, and Democritus dedicated their work to the activation of cognitive functions in the 4–5$^{th}$ centuries B.C. They focused on programs of versatile education, ensuring the subject of study in the "world of ideas", the need to develop the art of dialectical disputes, "the Socrates' matrimony", the importance of self-improvement.

Classical educators such as J. Herbert, A. Disterweg, J. Comenius, J. Pestalozzi, K. Ushinsky and others investigated aspects of the creative personalityformation, the development of its cognitive activity.

The formation of cognitive activity and creative thinking based on a holistic approach to learning was the subject of research of famous didactics of the 20th century L. Zankov, M. Danilov, I. Lerner, V. Onishchuk, etc.

The issues of improving the educational process in higher education are covered in the works of scientists A. Alexyuk, Y. Babansky, S. Sisoyeva. Activities in the process of learning, structuring the content of educational materials are described in the works of researchers V. Galuzinsky, I. Podlasy, O. Savchenko.V. Vodian, V. Dovganets, G. Zakharova, V. Karpiuk, G. Kostyshina, T. Temerivskaya covered the problem of development of students' cognitive activity in their scientific work. Formation of motivation for pedagogical activity became the subject of researches for such scientists as R. Borkivska, I. Zaitseva, M. Levrintz, N. Nikolaychuk, and features of self-education were studied by A. Kalinichenko, O. Lavrinenko, M. Maloivan, L. Savenkova.

However, in the process of reforming higher education, there is a need for research of innovative activities that will ensure the formation of the competencies of the modern specialist through the prism of cognitive activity and the consideration of student-centeredness as a resource for successful implementation of the competence approach. This determines the relevance of scientific intelligence.

**The aim** – to identify the factors and pedagogical conditions that contribute to the development of cognitive activity of students, to analyze ways and forms of its activation.

**Theoretical framework.** Emphasizing attention on the development of cognitive activity it should be made the distinction between the concepts of "cognitive activity", "cognitive functioning" and "cognitive autonomy", as supposing that all these concepts are synonymous series would be wrong. Working out the psychological and pedagogical literature we have found different definitions of these concepts. Cognitive activity is understood as a form of mental activity aimed at the cognition, perception and thinking of the learning subject. Cognitive functioning is a trait of personality that manifests itself in its relation to the process of cognition, readiness and desire for cognitive activity.

Scientist K. A. Abulkhanova-Slavskaya in her works states that activity is a qualitative characteristic of effective functioning. Cognitive activity acts as a phenomenon in relation to cognitive activity, so we cannot suppose any activity to be a functioning. For example, doing exercises or additional tasks after reading the main text is also an activity, but it is not a functitionng. After all, the concept of "activity" is close to "independence" as a creative expression of an individual approach [1].

The educator M. M. Fitsula emphasizes that creativity is the highest form of activity and independent functioning of a person, therefore, in the process of preparation of a future specialist in higher education, special attention should be paid to stimulating students' independent work, nurturing sustainable creative interests, purposeful creative pursuits [12]. The scientist notes that cognitive autonomy is a quality of personality, which is inherent in the desire and ability to acquire the necessary knowledge and skills, to solve tasks without the help (independently). Thus, cognitive activity is essentially cognitive independence, curiosity, activation of thinking processes, desire to learn new things.

Considering the approaches of scientists, we can say that cognitive activity is considered in two aspects in the scientific space i.e. as activity and as a personality trait. We believe that the two concepts of "cognitive activity" and "cognitive functioning" complement each other, because the result of cognitive functioning is cognitive activity. Functioning starts with activity. Accordingly, if there is an action there is an interest, as a result there is an activity.

It should be noted that cognitive functioning is characterized not only by the acquisition of knowledge, the formation of skills and abilities, but also the formation of their own attitude to the process and the result of the known.

Analyzing the development of cognitive functioning (I. Bilyakova [3], I. Beschastna [2], V. Blah [4], O. Boyko [5], V. Lozova [9]) it is necessary to identify the means, methods and conditions of activation: game as a way of activating cognitive functioning; application of the project method for the formation of cognitive activity; cognitive tasks as a means of activating learning activities; modeling as a way of cognitive activity; independent work as a means of enhancing cognitive activity; vocabulary work as a means of activating cognitive activity; Web-quest technology as a way to activate educational and cognitive activity; development of cognitive activity by means of personality-oriented learning; project activity as a condition of activation.

Considering the game as a way to trigger cognitive functioning, it should be noted that this type of activity allows to enrich, diversify and qualitatively improve the learning process. The game contains educational and learning opportunities for students. With the help of game cognitive functioning, in case of its proper use, the process of forming the professional qualities of the future specialist is activated.

According to the scientist O. Frankovskaya, business game promotes the acquisition of experience, the formation of critical thinking. When using this type of game, the learning process is as close as possible to actual practical activity [13]. We agree with the author's opinion, because the use of game models in traditional training promotes maximum freedom of thought and organization of the process of participation in it, subject to the restrictions specified in the rules of the game (time frame, coverage of topics for discussion or decision, work on the result).

Having analyzed scientific experience of the leading scientists who studied the impact of game technology on improving the educational process (O. Shurkhovetska [14], O. Yatsiy [15], I. Bilyakova [3]), we can conclude that pedagogical game fulfills the following main functions: communicative (communication, exchange of thoughts, emotions); diagnostic (manifestation of the subject in learning of intellectual, creative, organizational and social abilities); entertaining (entertainment as an association with some weakening of the classical requirements for the form of the lesson, which gives opportunities for creativity and self-expression); self-realization (able to reveal your character, charisma, hidden potentials).

We believe that one of the main aspects of the game used in the educational process is interaction, cooperation, communication of participants. If they are active, they wish to share and exchange thoughts, they will acquire the generalization of already known information, independent conclusions and prognosis for the development of a particular topics.

It is necessary to note that pedagogical game can only be an element of the educational process that helps to diversify, enrich, improve the study of a particular topic, but it cannot replace a full-fledged learning. It is advisable to use the project method to integrate different methods, learning tools, knowledge and skills from different fields of science. Its use increases the effectiveness of training, cross-curricular links are implemented for comprehensive elaboration of the topic.

According to the researcher H. Vashchenko, the project method is a search method that aims at developing creative abilities. The project method is a method based on creative search, unification of theory and practice [6]. Project activity is creativity, which is based on fundamental knowledge, based on which, as well as applying critical thinking, ability to distinguish and process information, a student can create a product of his own work. This method is not a new technology in teaching, but does not lose its relevance in the 21st century.

Nowadays, the society needs a specialist who is able to adapt quickly, to solve non-standard problems independently, and to acquire new knowledge. The development of creativity through higher education is essential and important to achieve this goal. Humanism, attention and respect for the student, focusing efforts not only on learning, but also on the overall development of the individual are the main features of the project approach. It is important to understand the fact that, like any other method, the

project method is not perfect, and therefore it has both advantages and disadvantages that must be known and must be taken into account when deciding whether to use it. It is clear that this method can not be a permanent one, only as a form of gaining knowledge, a part of the educational process.

Teacher is a mentor in the execution of the project, performs contemplative and directing functions. The main task of the teacher is to create a work atmosphere that is comfortable for all participants. Because, on the one hand, the role of the teacher is not very important in the game, however, the teacher makes lots of professional efforts in the preparatory stage, that involves planning, summarizing what has been learned, thinking through the details, defining goals and predicting the end result. It is obvious that the project method, like any educational technology, has its advantages and disadvantages, since many factors (student activity, interest in the topic, motivation, ability to work in a team, etc.) influence the process of learning and executing the project.

To analyze the advantages and disadvantages of the methods of activating the cognitive functioning of students, it was conducted a survey of experts, doctors of pedagogical sciences. There were 16 respondents. The study was carried out in 2019 on the basis of Chernivtsi National University named after Yu. Fedkovych, Cherkasy National University named after B. Khmelnytskyi and Ternopil National Economic University.

The survey contained the question "The advantages and disadvantages inherent in the project method". Among the advantages of the project method research skills took the first place (Fig. 1), which were identified by 9 people. Other results concerning this point were various ways of activity, analysis and synthesis of facts, systematization of material, formation of research skills. Undoubtedly, research skills are rather strong argument for choosing a project method as a teaching technology. The second place was taken by the development of creative thinking, which 7 respondents had chosen. This position also included creativity, the development of creative abilities, the development of cognitive skills and creative thinking. Third place was taken by independence of conclusions (5 people) and interest in the topic (4 people). The relevant answers were such as improving the skills of self-constructing their knowledge; interest in the mobility of students' knowledge. Other answers that had received fewer scores, but are equally important and justified, were the individual approach to the student (self-consolidation of knowledge), integration of knowledge and application in practice (rational allocation of teaching time), orientation in the information space (refinement), ability to work in a team (group work).

Therefore, having analyzed the gathered facts, we can say that the project method has many advantages. All of the above positions are justified, proved and needed for the formation of the student as a creative, fully developed, ready to face modern challenges personality.

Despite the considerable number of advantages of this method, for carrying out an objective analysis it is necessary to focus attention also on disadvantages (Fig. 2). One of the most important is the duration of the training, which was noted by 7 people. Some other moments concerning this issue are high time costs, creation of a clear algorithm. It is difficult to disagree

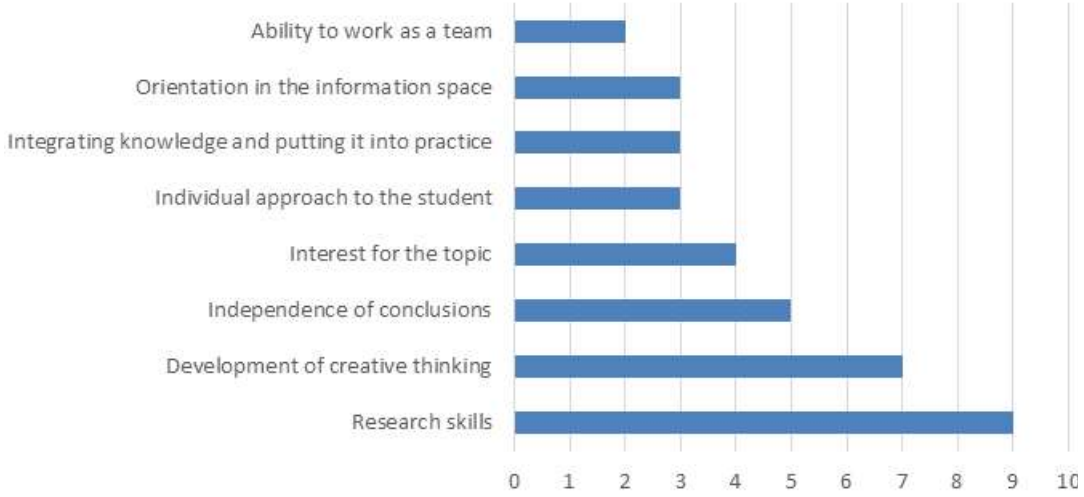


**Fig. 1.** "The advantages of the project method".

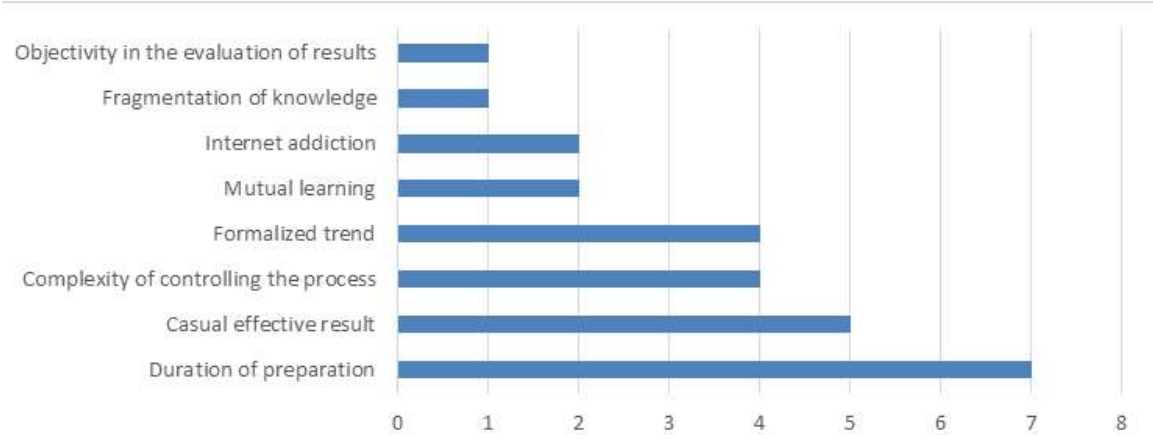


**Fig. 2.** "The disadvantages of the project method".

with this, since the time spent on planning, thinking and anticipating different situations of the preparatory and organizational stages is considerable. Second place was taken by not always effective result (5 people). In fact, the result is influenced by many factors that cannot always be predicted, which can lead to misalignment. Third place – the complexity of controlling the learning process (4 people) and formalized nature (adherence to requirements) – also 4. Given the advantages of the project method (creativity, independence, research), it is clear that it is difficult to control the processes of independence and creativity.

It is difficult to agree with the statement that the formalized nature, that is, compliance with the requirements, rules of the project, "regulation" of tasks is a disadvantage. This is more of an advantage, because without clear rules and delineation of the work it is impossible to obtain the desired or planned result of the project. The disadvantages noted by the respondents include: mutual education, dependence on the Internet, fragmentation of knowledge and objectivity in evaluating the results of the study.

Such results are contradictory, because the above disadvantages (mutual learning, the Internet, objectivity in evaluating the results) can be fully transferred to the advantage plane.

The researcher I. Beschastna, focusing on cognitive tasks as one of the means of intensifying learning activities, identifies the following: tasks-questions, tasks for the development of monologue, tasks aimed at controlling their own actions [2].

In order to develop student activity in the process of explaining new teaching material, it is advisable to ask the group some problematic questions or tasks that contain the essence of the problem. For example, a teacher might say, "I give you a list of grammatical times of the active state in English. Your task is to mention the creation of these temporal constructions during the report and to give examples of situational sentences every time." In this way, the teacher encourages students to reproduce in memory of previously learned material independently, to present the comprehension of their own understanding in the form of situational sentences and as a result – to acquire new knowledge.

The task for the development of monologue speech, the control of their own actions can look like creation of their own "product". For example, a teacher to summarize the topic "My future profession and its prospects for development" is aimed to create their own monologue presentation of this problem in the form of a presentation, showing the results of the profession status according to statistics with their own comments, some predictions about the prospects of specialty development, etc. These types of tasks are aimed at student mobility, his/her ability to draw on previous knowledge, summarize and predict the future. In addition, this form of education contributes to the increase of memory, the development of imagination, the language of students, formed a market way of thinking.

Analyzing the work of scientists in the field of pedagogy and psychology, who are exploring in their works ways of activating cognitive activity, independence, innovation in the educational process (V. Guzeev [7], L. Zankov [8], L. Maksymchuk [10], S. Sysoyeva [11]) outline the basic functions of teaching methods and techniques: educational (in the process of its use knowledge, skills and abilities are acquired); developmental (a system of teaching methods aimed at the development of intelligence, logic, cognitive activity and independence); invigorating (thanks to the successful choice of methods, the interest in learning is developing).

Being organized at the proper level, students' independent educational work will facilitate the development of their thinking, observation, skills formation, application of theoretical knowledge to practical activity, development of creative potential. The main task of a higher educational institution is to teach a student to think, reason, argue, form a cause and effect relationship, make his own judgments, make independent conclusions, which will promote active mental activity, development of cognitive abilities.

Self-study learning activities require a number of factors: basic knowledge of the subject being studied, motivations and reasons for learning, skills, self-control and self-organization. Independent work – a certain creativity, a process where the student himself allocates his time, realizes the need for fulfillment, looks for methods and forms that are convenient for its implementation.

The scientist V. Blah states that self-control and independent work of students positively influences planning of the personal budget of time, accustoms to systematic work with literature, promotes assimilation of theoretical knowledge, activation of cognitive activity, increases the level of interest in the subject [4].

When using this method of cognition, it is necessary to bear in mind its disadvantages, the role of the teacher in guiding students' independent work, and that this method cannot serve as the main source of information. It is important to take into account the fact that the group may have students with different levels of basic knowledge and skills in the subject. To solve this problem, you must use tasks with different levels of complexity to enable everyone to perform according to their level of knowledge. Individualization (individual approach) is aimed at the implementation of the personality-activity approach in the educational process.

In the educational process it is important to acquaint students with the prospects of science development, to inform about what problems modern researchers are working on, what are the advantages of innovations, what is the effectiveness. This information will encourage young people to search. In order to gain deep and solid knowledge, it is important not only to communicate the facts, but also to explain, to encourage students to ask the questions "how" and "why" and so on. Personal life experiences, formed knowledge, ideas and concepts influence individual cognitive activity, enhance students' cognitive processes, promote meaningful understanding, memorization and assimilation of new knowledge.

It is undeniable that the process of learning is a process of interaction between the teacher and the student, although for a long time in Pedagogy such relations were subject-object. According to the scientist V. Lozova, in the subject-object interaction, the teacher acts as a carrier of knowledge, and the task of the student is reduced to their reproduction, with the goals and methods of educational activity, the direction of the end result is set by the teacher [9]. Relationships in the educational process are defined as subject-subject, which allows the student to plan his/her activity independently and to predict the results. In this format, the role of not only the student but also the teacher whose task is to organize interaction, cooperation, trust, the ratio of teaching influence and student activity in the learning process is changing.

The modern student has ceased to be a passive participant in the educational process. Reproduction of information (reproduction) or little functioning in the learning activities do not lead to complete mastery of the subject and the overall development of the individual. The transition from informative to active teaching methods includes signs of difficulty, scientific search, the use of independent work. There is a rejection of the rigid framework for the regulation of the submission of educational material in favor of developing methods that stimulate student creativity.

The scientist H. Vashchenko asserted convincingly that in order to increase the level of student activity in the learning process it is important to give the pupil the role of a researcher. The modern student must not only learn certain material, but solve certain issues independently [6]. New information that is introduced to a student is assimilated only when he or she uses it to verify this information in practice. A positive practice is the announcement of new educational material in the form of a heuristic conversation, stories where the student is an active participant in the process.

Let's consider another way of activating educational and cognitive activity – Web quest technology. It is a variety of ways of teaching and creative activity of students, interest in educational material, encouragement to manifestations of creative initiative. Pedagogical experience shows that the use of online resources in the classroom causes emotional uplift and activation of participants in the educational process.

Based on the very interpretation of the concept of "web quest" we understand that "web" means "through the Internet, websites" and "quest" is a kind of "adventure", "task", "game". In other words, the

online environment creates problematic tasks or situations using game elements or competitions. Educator O. Boyko states that the integration of web-based quests in the learning process activates the learning process, promotes individualization of learning, its quality. Such activity transforms students into active subjects of learning activity, enhancing not only motivation but also responsibility for results [5].

Working in a web quest format makes the learning process more diverse. The use of this technology provides new opportunities for the acquisition and improvement of knowledge. The teacher takes the position of the process' organizer, consultant, coordinator of student research work, which creates favorable conditions for independent work, supports initiatives and motivates. New information technologies create the conditions for the development of educational space, familiarization with the assets of foreign scientists, the use of distance learning, for continuous study of the subject.

Being asked the question "What exactly is important from the experience of the past years?" (Fig. 3) 8 respondents selected an analysis of past years' achievements. Other options for answers were also included in this issue such as the Soviet system of education and training, the experience of national and foreign scientists, working with primary sources in the direction of vocational training, classical methods, the principle of historicism, reliance on the experience of others, reliance on own experience. The synthesis of the listed answer options was carried out in accordance with the key words, such as "achievements of past years". This question is important, and the answers are valuable, because the experience of past years is the work and achievements of scientists, educators, theorists and practitioners who have worked for many years to improve and enrich pedagogical science and remain relevant today.

The third position was taken by the involvement of students in dynamic activity i.e. creation of educational courses (3 persons). Young people are an inexhaustible source of energy, innovation, activity and dedication. This is why this resource should be mobilized and used as an additional source of information and assistance. It is possible to cooperate with students in the process of course creation, curriculum development, organization of courses, additional sources of cognition (watching cognitive films, participation in competitions). The fourth and fifth place in the questionnaire are the development of written language (mother tongue), the use of problematic teaching methods, innovative technologies in teaching (experience of pedagogical innovators), review of novelties of literature (analysis of best pedagogical experience) and work with periodicals.

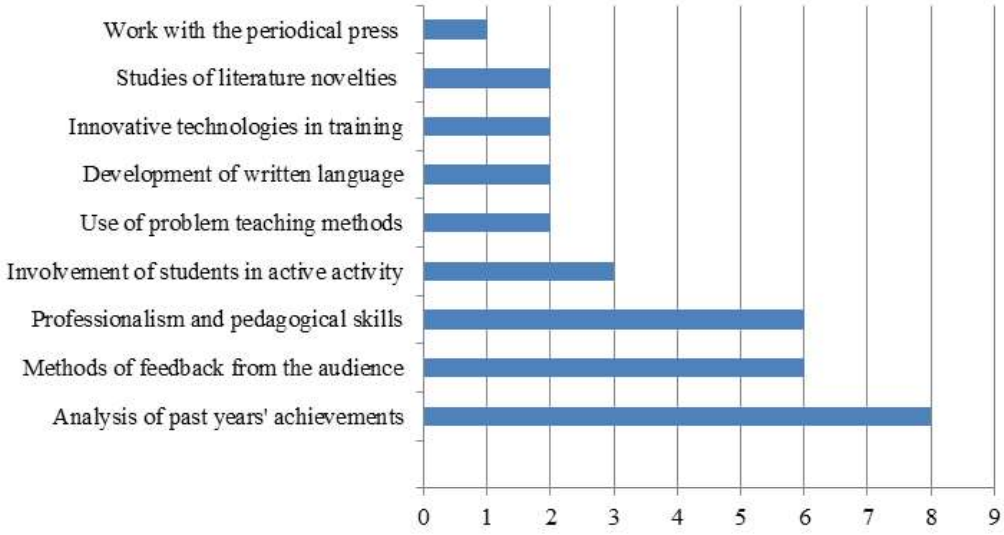


**Fig. 3. "**Relevance of the experience of past years".

Therefore, problematic learning as an innovative technology, although used since the time of the ancient Greek philosophers Socrates and Pythagoras, has undergone significant changes, has taken various forms and methods of implementation, but the essence remains constant, it's the formulation of a problematic question or situation in order to further seek their solution. The result of this method is self-development, the acquisition of additional knowledge and skills.

**Conclusions and Prospects for Research.** Having analyzed scientific approaches to the definition for the concepts of "cognitive functioning" and "cogni-

tive activity", we can argue about their difference (not always activity is functioning and vice versa) and simultaneous complementarily.

Researching the variety of ways and means of activating students' cognitive activity (games as a way to activate cognitive activity, method of projects, cognitive tasks, modeling, independent work, web quest technology) it is determined that they are all focused on the creative work of the student, avoiding the standard forms of teaching, changing the thinking and participation of both a student and a teacher.

Using any teaching technology, the teacher should understand that each of them has advantages and disadvantages. The learning process will not help to activate the student, if it is built on one method or form. The focus is on the fact that the learning process is a combination of different methods and means, the search for a new one, improvement and diversity of the available, flexibility, openness, perception, desire to study and learn by yourself. Cognitive functioning begins with activity, independence, initiative, desire to know more, go beyond what is already known. New information technologies create the conditions for the development of educational space, familiarization with the assets of foreign scientists, the use of distance learning, for continuous studying of the subject.

The reproductions of the material and the low activity during its study are not sufficient for the full development and complete mastery of the subject. In the modern pedagogical space, the relationship between the student and the teacher has shifted to the subject-subjective level, which enables the student to plan his/her activity independently, predict the results, be responsible for the final learning result.

Thus, the educational process is always a masterful combination of the various methods, forms, and ways of studying, techniques and technologies by the teachers. Only then the desired and expected result can be obtained. The prospect of further research is to study the newest methods, forms, ways of intensifying the cognitive activity of higher education applicants systematically, which will provide competent studying, training of highly specialized specialists.

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