

Oksana Povidaichyk

Candidate of Pedagogic Sciences (Ph.D.), Associate Professor,
Associate Professor at the Department of Sociology and Social Work
State University «Uzhhorod National University», Uzhhorod

Natalia Varga

Postgraduate student at the Department of General Pedagogic and
Pedagogy of the High School
State University «Uzhhorod National University», Uzhhorod

**PROBLEM-BASED LEARNING AS A PEDAGOGICAL
CONDITION OF PREPARING OF STUDENTS FOR RESEARCH
WORK**

The article deals with the issue of problem-based learning as a pedagogical condition of the professional preparation of higher educational institutions students for scientific research work. The scientific approaches to the interpretation of the term «scientific research work» are analyzed. The peculiarities of problem-based learning as innovative educational technology are revealed. A comparative characteristic of traditional and problem-based learning is proposed and the advantages of the latter are identified. It has been proved that problem-based learning contributes to the growth of students' motivation to research work, the formation of skills and abilities of research activities and increases readiness for scientific research work. The main stages of creation of a problem situation as the basis of the problem-based learning are analyzed. The typology of problem situations is carried out. The peculiarity of their application through different forms of organization of the educational process is considered.

Key words: *professional preparation of specialists, research work, scientific methods of cognition, problem-based learning, traditional education, problem situation.*

Introduction. The modern period of the society development is characterized by the changes in all spheres of human activity. The rapid pace of socio-economic transformations in the country, changes in the value orientations and an increase in the amount of information have led to a number of requirements for a higher professional education system. Of particular urgency is the problem of preparation of highly skilled specialists who can adequately perceive complicated life circumstances, correctly evaluate them, quickly adapt to new cognitive situations, predict the results of their own activities, using their intellectual and creative potential. At each level of training, it is necessary to develop students' creative thinking, research skills, since without it is impossible to continue education and find a job on the labor market. In this regard, research activities are gaining an increasing importance and becoming a defining indispensable component of the future specialists professional preparation.

Formation of the specialists' readiness for research work as a professionally significant quality is carried out within the framework of integrated processes of professional preparation and development of personality under certain pedagogical conditions. Among other, the defining role is attributed to problem-based learning, general trends of which are the convergence of educational and scientific knowledge, development of activity, autonomy, creative thinking of students.

Different aspects of the problem of forming of students' readiness for research work have been widely elucidated by a number of home and foreign scholars. Thus, the bases of organization of scientific research work of future specialists of various professional spheres are studied and highlighted in the works of G. Artemchuk, T. Holub, V. Murray, L. Norton, V. Proshkin, N. Uisimbayeva and others. The problems of activation of students' research activities are disclosed by E. Wenger, D. Woodhaus, O. Dubasenyuk, E. Kuklin, F. Curlinger, O. Mykytyuk, E. Reichman and others. The works of J. Bruner, I. Zimnaya, M. Levin, E. Nikitina, E. Kovalevskaya, T. Kudryavtseva and others are dedicated to the issue of problem-based learning in the process of preparation of future specialists in the higher educational establishments. At the same time, the analysis of theoretical and

practical researches testify that possibilities of problem-based learning in the process of the preparation of students for research work have not been accounted for in a sufficient way.

The purpose of the article is to determine the peculiarities of problem-based learning as a pedagogical condition of the forming of students' readiness for scientific research work.

§ 1. The essence of the concept of students' research work.

It is traditionally believed that students' research work is a system of methods, means and measures for students' learning in the process of training at different stages of the scientific and innovation cycle, which includes fundamental and applied research. Research work is one of the most important means of effective training of specialists through mastering of the basics of professional creative activity, methods, techniques and skills of conducting of research activity, developing of creativity, independence and the ability to quickly navigate in socio-economic situations. In addition, scientific research work is understood as the search activity, which is expressed, above all, in independent creative research. Such activity is aimed at explaining of phenomena and processes, establishing their relationships, theoretical and experimental substantiation of facts, the discovery of regularities with the help of scientific methods of cognition [1, p. 114].

The researcher N. Uisimbayeva, interpreting scientific research work of students as one of the forms of cognitive and creative activity, considers that scientific research work provides the formation of intellectual activity, which is an integral part of the professional competence of the future specialist [2, p. 244].

From the standpoint of D. Woodhaus and R. Geiger, the research work is intellectually controlled scientific research, which involves the acquisition of knowledge through the discovery and systematization of new information or the development and improvement of available information and experience [3, p. 42; 4, p. 4].

E. Reikhman proposes to consider scientific research work of the students as the activity, which is expressed, first of all, in an independent creative research. Such

practice is aimed at explaining of phenomena and processes, establishing their relationships, theoretical and experimental substantiation of facts and the discovery of regularities with the help of scientific methods of cognition. Due to the search activity, the subjective nature of "discoveries" can acquire some objective significance and novelty [5, p. 165].

G. Artemchuk and T. Holub emphasize the significant role of scientific research work in the process of formation of the professional competence of future teachers. Scientific interests and research motives of future teachers in the process of scientific research work can be divided into the stages in which specialists: are studying methods of scientific research and are adapting to new conditions of learning, are performing reproductive and reproductive-research activities; are actively engaged in the educational and research activity, carry out research tasks within the framework of independent work; are participating in the educational research (for a significant increase in the volume of independent work) and in the industrial research.

The main goals of the efficiency of scientific research work are improving the quality of professional training, forming in a future specialist the ability to think independently and creatively. In general, they can be formulated as: the development of the complex of research, experimental and theoretical knowledge, skills and competences; formation of the dialectical logic and scientific thinking; formation of the scientific outlook and mastering of the methods of scientific knowledge; formation of the professional and cultural outlook of the specialist through the integration of educational and scientific progress; creation of positive motivation and steady interest in the specialty that is being studied; implication of interest in scientific research work and awareness of its social significance; development of the public speaking skills and participating in scholarly discussions; modernization of professional training in the process of updating of the content of the educational standard, etc. [6; 7].

At the same time, of a special value the following social and personality-significant qualities are acquired: readiness for determined and purposeful actions,

desire to self-perfection and creative search, increasing of the efficiency and quality of pedagogical work, usage of interactive, informational and pedagogical technologies [8].

In agreement with the opinion of V. Proshkin, we can note that the considered positions of home scholars do not take into account the fact that a significant number of students who do not show clearly manifested abilities for research activities may be outside of it [1]. In our opinion, the preparation of students for scientific research work in the higher educational institution should take place in the form of a system that would include: academic and scientific activity, student scientific research, as well as the implementation of forms, methods and pedagogical conditions aimed at the formation of the motivation of students to implement scientific research based on the educational process individualization.

We agree with the opinion of G. Yagenska, who supposes that research work of students involves close cooperation with a teacher. The object of this interaction is the research material. The role of the teacher is to understand and direct the activity of the student through the subject of the research to promote mastering of research methods and profound knowledge of scientific information [9, p. 342].

At the same time, in the process of implementation of scientific research technologies, special attention should be paid to the formation and correction of the process of learning knowledge, the development of search and creative abilities and the evaluation of the results of educational and cognitive activities.

Thus, by summarizing the scientific approaches of domestic scientists, we will consider the scientific research work of students as the special type of intellectual and creative activity that arises as a result of the functioning of individual mechanisms of search activity and involves an independent research aimed at the theoretical and experimental study of phenomena and processes, the substantiation of facts, the identification of regularities with the help of scientific methods of cognition.

§ 2. Problem-based learning in the process of research preparation of the students.

Formation of the readiness of students for research work is conditioned by the substantiation and realization of certain pedagogical conditions. Studying the problem of professional training of specialists in the high school, A. Semenova defines «pedagogical conditions» as the circumstances which lay foundations for the integral productive pedagogical process of professional training of specialists, which is mediated by the activity of the individual or by a group of people [10, p. 243].

We consider pedagogical conditions as the educational measures that ensure the transition of students to a higher level of development, which is determined by the goals of the educational process. At the same time, these measures provide for motivation conditionality, purposeful choice of content, methods, organizational forms of education of students.

There are two groups of pedagogical conditions for the professional training of students: general and partial.

General conditions reflect the general scientific level of the methodology used by the most scientific branches. They include: organization of the educational process as a coherent purposeful system; development of humanistic orientation of future specialists; formation of the readiness of students for creative use of forms, methods and technologies in their professional activity; formation of the reflexive position, the ability to self-control at the different stages of learning; methodological, organizational, managerial, material, technical, methodical and personnel support of professional training, etc.

On the basis of the selected general conditions, partial pedagogical conditions are implemented. They reflect the partial scientific level of the methodology, that is, a set of methods, principles and procedures that are used in a particular scientific field. Partial pedagogical conditions are connected with the peculiarities of professional training and the activity of a higher educational institution. In particular, the specifics of the curricula of the preparation of specialists, the diversity of content, forms, methods, means and technologies of training.

On the basis of generalization of the results of scientific works, empirical studies on the preparation of students for scientific research work (A. Kushniruk, Y.

Lavrysh, O. Nozdrova, R. Sabadishin, I. Sopivnik, N. Pogrebnyak, etc.), as well as our own experience, we have defined, that one of the pedagogical conditions of formation of the students' readiness for scientific research work is problem-based learning.

In order to identify the specifics of problem-based learning, we give a comparative description of problem-based and traditional education.

Traditional education is a type of organization of the educational process, which provides not only the perception of knowledge in the "finished form" and the consolidation of their actions following the model, but also provides explanations, comments, evidence of the truth of scientific laws, facts, and conclusions. Such training develops observation, thinking, promotes the emergence of interest in knowledge, but it is based only on the reproductive cognitive activity of students [11].

A number of authors (A. Verbitsky, V. Okon, T. Kudryavtsev, I. Reinhard, etc.) consider that the main disadvantage of traditional methods of learning is their passiveness, which is the result of such preconditions:

- An emphasis on listeners' memory in the learning process. School didactics has been built on such principle for a long time, and the reason for this was a blind faith in the word, written or said by the teacher. This system of education completely suppresses curiosity and independence of mental activity of students;
- Undeveloped psychology of learning, which leads to the identification of learning and memorization of the finished educational material [12].

According to T. Kudryavtsev, in the process of traditional education, only a teacher is really active. As for the students, the basic load of cognitive activity falls on their memory, internal mental activity is insignificant and the elements of independent search, creativity are minimized at all [13].

The analysis of psychological and pedagogical literature testifies that traditional education is based on the associative theory of thinking (V. Zankov, L. Itelson, A. Leontiev, O. Tikhomirov, etc.), which is characterized by a formal logical scheme of the formation of concepts. Proponents of this theory experimentally

studied mainly memory, and thinking was explained by its properties. Scientists have found that in the course of memorization among some representations, thoughts, words, images there are formed more or less strong links or associations. These connections, in their opinion, in the future determine the course of human understanding. According to this theory, the subject who solves a certain problem uses his various associations and comes up with his own solution. The task can not be solved if these connections are missing or they are not installed.

Currently, most scholars have moved away from the associative theory of thinking, however, they emphasize that the very fact of association as a phenomenon of reality can not be denied. The main disadvantage of this theory of thinking lies in the fact that there is no analysis of the subject's activity and one of the main questions of this doctrine is the question of reproduction of knowledge and reproduction of ideas.

Thus, traditional learning does not ensure the effective development of mental abilities of students, since it is based on the laws of reproductive thinking, and not on the creative cognitive activity of a person. In the framework of traditional education it is impossible to create the conditions of the formation of readiness of future specialists for scientific research work in full measure because it is aimed at the perception and memorization of information, rather than at the formation of students' independence, the development of their creativity, which is at the core of the scientific research work.

The author of the concept of problem-based learning is J. Bruner [14]. At the heart of his theory are the idea of structuring of the educational material and the idea of the dominant role of intuitive thinking in the process of learning new knowledge. The scientist believes that learning should lead to the development of intuitive thinking, which is opposed to analytical or logical thinking. However, his theory is characterized by excessive psychologization and it is ineffective for teaching practice because a teacher does not receive scientifically substantiated recommendations regarding the rational organization of the educational process.

Other scientific approaches to the definition of problem-based learning argue that any type of studying is problematic [15]; problem-based learning is a research method [16]; problem-based learning can not be introduced into the educational process of the university, and all the conversations about it – are another tribute to the «pedagogical fashion» [17].

We agree with the opinion that problem-based learning is associated with a research method of learning – its structure is similar to this method, but it is not possible to identify learning and the method by definition.

Problem-based learning is a theory, which includes a system of methods, among which the research method can be attributed. The inability to apply problem-based learning "in its pure form" into the system of higher education, in our opinion, is based on the methodological difficulties associated with structuring of the content of a discipline and adapting of the problem methods to the traditional forms of organization of the educational process. In this regard, it is expedient to have a partial transition to the problem-based education, optimally combining it with the traditional one.

The peculiarity of the modern stage of the problem-based learning development, evidenced by a number of studies (I. Zimnya, E. Kovalevskaya, N. Morieva, L. Norton, etc.), is that it uses the assertions of psychology about the close interconnection of learning processes, cognition, research and thinking as much as possible. Thus, according to L. Norton, the study is defined as an active process that develops critical thinking and forms the ability to solve problems; as a natural mechanism for group work and the development of communication skills [18]. At the same time, the learning process should simulate the process of productive thinking, the central element of which is the ability to creativity and discoveries. This provision is one of the main psychological aspects of the problem-based learning. Thinking is essentially a cognition that leads to solving problems that face a person.

The tasks solved by students at the level of creative thinking always have problem content. That means they are constructed on the basis of the principle of problem. Problematics is a logical-epistemological pattern of the relationship

between reflection and creativity with the dialectical law of unity and the struggle of opposites. The indicated regularity of cognition can be used as a principle underlying such teaching methods that contribute to the development of student thinking, the formation of cognitive independence and the ways of actions underlying scientific research work.

On the other hand, problematics is the psychological pattern of thinking, which determines the content and form of cognitive activity of a person. In this definition of problematics, the key aspect is that it contributes to the development of skills and abilities of mastering of knowledge, creates conditions for the development of the ways of cognition, on the basis of which the ideas about scientific research work is formed.

As T. Kudryavtsev noted, problematics is not only a psychological category, but also a didactic. Thus, in the educational process, the problematics is manifested in the aspiration and ability of students: a) to allocate the most important, significant, key ideas and positions, and to group together the actual material, the system of evidence and consequences (this is the content aspect of the problematics); b) to overcome the cognitive difficulties (operational side of problematics); c) to stimulate the cognitive need (motivational side) [13].

Thus, problem-based learning, grounded on the psychological and didactic principle of problematics, promotes the formation of students' motivation to master one or another knowledge, skills and abilities, the definition of the purpose and content of cognitive needs.

The essence of problem-based learning lies in the fact that in the process of professional training the character and structure of student's cognitive activity changes, and this leads to the development of creative potential of the individual. The purpose of learning is not knowledge itself, but the means of obtaining of this knowledge. Problem-based learning provides the formation of such psychological structures as: the ability of the subject to self-transfer of previously acquired knowledge and skills into the new situation; the definition of the problem in one or another situation; the vision of the structure of the object and its new functions; the

ability to see an alternative in solving a problem. The listed features of activity are formed only in the process of solving the problems while independent searching of knowledge. In these circumstances, the role of the teacher changes – the main function is not the transfer of the finished information, but the creation of conditions for the students to obtain it on their own.

The main features of problem-based learning are psychological and pedagogical methods of organization and management of cognitive activity of students. Traditional learning becomes problem-based when the teacher constructs so-called educational problems and presents them in the various forms, taking into account the degree of participation of students in solving these problems.

It is worth noting that problem-based learning is not limited by the presentation of scientific facts or laws that are discovered by humanity. They can form the basis of a studied problem and with the correct presentation of it there is a problem situation that stimulates students to find a solution to it. Thus, the key aspect of problem-based learning is not the acquisition of new scientific knowledge, but the creation of the conditions for the emergence of students' mental activity. Therefore, it is not entirely legitimate to identify unresolved problems of science with the issues that are being solved in the process of problem-based learning.

Thus, the fundamental difference between problem-based learning from the traditional one is that knowledge and methods of action are not passed on to students in the finished form, but acquired by them in the process of independent cognitive activity. In addition, in problem-based learning, in contrast to the traditional, the role of the student as a subject of learning cognition and the role of a teacher as the organizer of independent cognitive activity of the students are intensified. In the process of independent cognitive activity, the level of motivation for the search work increases, abilities and research skills are created, and therefore the readiness of students for scientific research work are formed.

§ 3. Problem situation as a means of students' research work activation.

As a result of the study of problem-based learning M. Levin notes that its structure is similar to the structure of scientific research activity, since in the process

of solving the problem situation there are elements that are inherent in research activities: the definition of the purpose, methods and means, the construction of the logic of the research, analysis, hypothesis, the formulation of conclusions as a result of the study. It means that in the process of solving the problem situations, the logic of learning cognition simulates the logic of scientific cognition. On the basis of this statement, it can be concluded that the solution of problem situations contributes to the development of research skills and the formation of readiness for scientific research work of students. In this regard, we can state the significant potential of problem situations in the process of forming the readiness of students to scientific research work [19].

Let us find out the essence of the concept of «problem situation» and its role in the process of forming of the readiness of students to scientific research work.

Domestic and home scholars present different interpretations of the problem situation, but all of them are united in the fact that its characteristic feature is the psychological state of intellectual complication (A. Brushlinsky, M. Garunov, E. Kovalenko, T. Kudryavtsev, I. Lerner, M. Makhmutov , V. Okony, V. Pavlenko, M. Yarmachenko). Accordingly, the problem situation is understood as the psychological state of mental interaction of the subject (student) with the object of cognition (educational material), characterized by the emergence of intellectual complication, in which the student can not explain the new position or fact on the basis of previously obtained knowledge or actions. Consequently, the problem situation involves the relationship between the knowledge assimilated by person and the person himself as a subject of cognition. It is the latter fact that determines the psychological basis of the problem situation [20].

The problem situation is a rather complex phenomenon, which contains not only the substantive-content component (known – the specific conditions of the task, clear questions and unknown – new knowledge and methods of activity), but also the motivational (cognitive needs of the student) and the personal (cognitive capabilities of the student) components. Substantive-content component involves active cognitive activity of the subject of awareness of the difficulties and the formulation of

contradictions. In the process of the resolving of contradictions, students learn such techniques of logical thinking as the ability to analyze, allocate the main and secondary features of phenomena, processes, establish cause-effect relationships between them, choose one or another judgment from several possible, draw conclusions, assess their correctness, transfer the acquired knowledge and methods of activity into the realm of new conditions.

One of the main pedagogical tasks while applying the problem situations in the learning process is the creation of the conditions in which these situations will be «accepted» by the student. Inclusion of the student into the problem situation is manifested in the fact that unexpectedly in his consciousness there is a psychological complication, which is formed as a result of the cognitive barrier. Psychologically, the student experiences this state as a cognitive contradiction, analysis of which turns into the need to reveal the essence of the studied phenomenon, that is, to analyze the reasons that cause this contradiction, to identify ways out of it. Therefore, one of the main conditions for creation of the problem situation is to identify the contradictions in the material under investigation.

To create a problem situation, first of all, it is necessary to change the structure of the educational material in order to identify the theoretical possibilities for the creation of contradictions. Namely the emergence of contradictions will promote to include the student into the problem situation.

Considering the structure of the scientific research work of students as a set of motivational, orientational, active and reflexive components, we will single out some ways of their activation in the process of application of the problem situation [20]:

- Since the problem situation stimulates the student's cognitive needs, in the process of creating and solving the problem situations, the activation of the motivational component of scientific research work is provided;
- Due to the joint analysis of the problem situations, there are created the conditions for the formation of the ideas about the logic of scientific knowledge and the involved mental processes, so it is possible to create conditions to increase the level of the orientational component in the process of solving the problem situations;

– Since in the process of solving the contradictions that underlie the problem situation, students learn such techniques of logical thinking as ability to analyze, to allocate the main and secondary features of phenomena, processes, to establish cause-effect relationships between them, to choose one or another judgment from several possible, to draw the conclusions, to evaluate their correctness, to transfer the acquired knowledge and methods of activity into the new conditions, so it is possible to activate the active component of scientific research work;

– Providing the opportunity for students to analyze their own activities independently based on their perceptions about it, which will create conditions for activation of the reflexive component of scientific research work.

Designing of the problem situations is a complex and time-consuming process. In particular, E. Nikitina proposed an algorithm for creating the problem situation, which involves six stages – search, analytical, preparatory, definitive, decisive and final.

1. The search stage includes the separation of questions from the educational material that will form the basis of the problem situation. For the organization of this stage, it is necessary to clearly visualize the structure and content of the entire course of study and individual topics, as well as their interrelations. Within this stage, the issues that cause difficulties for students in the perception and understanding of new material are determined; the possible shortcomings of the problem situation are analyzed.

2. The analytical stage involves the diagnosis of the factual knowledge of students, according to which the problem situation should be based. Such diagnostics is carried out during a conversation with students or in the form of a frontal written survey, in which issues include not only the establishment of the level of knowledge of certain concepts, but also the understanding of their essence.

3. The preparatory stage consists in the formation of contradictions. At this stage, there are determined the means for the creation of the contradiction (experiment, description of the event, theoretical presentation of the material, etc.), material and its form, questions and the purpose for their asking.

4. The defining stage involves the prediction of possible reaction of students to the created situation. It is important to be able to put yourself in student's place to predict their possible reaction and response. To do this, you need to know well the students' audience, which makes it easier to predict the nature of the contradictions. The thing that makes the students of one audience interested may leave students of other audience indifferent, which complicates the creation of the problem situation. This can happen for various reasons. The level of students' training, their activity, number, and the teacher's behavior play an important role here.

5. The decisive stage is to identify different possible ways of resolving controversy. There is a widespread statement that the problem situations have to be solved by students themselves. We suppose this fact not to be always possible. Some problems have been solved for a long time by prominent scientists of the world and their solution is not always trivial. But the obligatory task of the teacher is the emotional preparation and the students' set-up for solving the problem situation.

6. The final stage allows us to determine the ways of analyze of the causes of the contradiction, reveal the mechanism of its appearance, make generalizations, practical and theoretical conclusions. This stage is of particular importance, as the methodological literacy of students is being formed, self-analysis of their activities and analysis of those mental processes that contribute to the solution of the problem takes place [20].

It should be noted that the analysis of students' activity takes place at each of the specified stages of creation the problem situation.

Taking into account the possibilities of the problem situations in the process of activating of scientific research work of students, we will consider their typology. There are distinguished the problem situations created by the teacher, formed on really existing contradictions in science and those that arose as a result of cognitive activity of students.

The purpose of the creation of the problem situation by the teacher is to increase the level of motivation of students to implement scientific research work, which occurs through the stimulation of cognitive activity of students while

mastering new knowledge and creating conditions in which a cognitive need arise. The main contradictions on which the problem situation is based are: between theory and experiment; between the relevance of the problem and its insufficient theoretical elaboration; between the theoretical value and practical expediency, contradictions in scientific theories, for solution of which a new approach is necessary.

Problem situations, which are based on really existing contradictions in science, are also aimed at increasing the level of motivation of students to research work. In particular, there is a stimulation of the cognitive interest, the formation of motivation for the further study of the material, the creation of the conditions for students' awareness of the social significance of this problem.

Problem situations that arise as a result of students' cognitive activity include the development of thinking activity, analysis, analogy, generalization, concretization, transfer of knowledge to a new situation, etc. At the same time there are such contradictions: between the theoretically possible solutions and their practical expediency; between a large number of factual data and the lack of a method for their processing and analysis, contradictions during their own deliberations.

Creation and application of problem situations in the process of formation of readiness of students to scientific research work takes place at lectures, practical and laboratory classes. So, during a lecture, a demonstration experiment is being used, the results of which are directly opposite to the conclusions (problem situation of the first type). This makes students surprised; they try to explain the result and to find a mistake in their thoughts. The result of solving the problem situation is the new knowledge that students produce on their own, that is, it is not given by the teacher in the finished form. By creating this kind of problem situation, students analyze and systematize their own knowledge, ponder, put forward and substantiate hypotheses, and the contradiction caused by the teacher stimulates their cognitive need. At the same time, the teacher creates conditions for activation students' intellectual activity. Thus, in the process of studying the new material, skills and abilities of scientific

research work (analysis, synthesis, generalization, systematization, abstraction, hypothesis, conclusions formulation, etc.) are formed.

Of particular importance in the process of organization of lectures are problem situations of the second type. It has been already mentioned, that in the process of creation of such situations the contradictions that really exist in science are used. Using these contradictions at the lectures stimulates students to study the subject deeper, contributes to the formation of the idea of the social significance of the problem under study and its significance for science in general. Consequently, within the framework of such situations there is a stimulation of cognitive activity, formation of the idea of the logic of scientific cognition, increasing of the interest in solving the problem.

Problem situations of the third type provide opportunities for activation of research work during practical classes. They are constructed on the basis of theoretical tasks, the peculiarity of which lies in the fact that as the result of their solution, students do not master new knowledge, but develop their thinking. In this case, the student becomes the subject of research activity. In the process of solving a particular situation, students analyze and generalize information, compare, identify the conditions for the emergency of contradictions, logically build their own inferences and formulate conclusions. So, within the framework of the problem situations under consideration, conditions for the development of the theoretical thinking process are created.

Conclusions. Modern society makes demands for the training of highly-qualified specialists, who possess not only a certain amount of professional information, but are also able to be actively engaged in creative work, have a high level of readiness for research work.

Students' research work of is regarded as a special type of intellectual and creative activity that arises as a result of the functioning of individual mechanisms of search activity and involves independent research aimed at theoretical and experimental study of phenomena and processes, the substantiation of facts, the identification of regularities with the help of scientific methods of cognition.

Formation of the students' readiness for scientific research work is predetermined by the substantiation and realization of certain pedagogical conditions, one of which is problem-based learning. Problem-based learning is the organization of the educational process, which involves the creation of problem situations (under the guidance of a teacher) and active independent activities of students to solve them.

Problem situation is the psychological state of the mental interaction of the subject (student) with the object of cognition (educational material), which is characterized by the emergence of intellectual complication, in which the student can not explain the new position or fact on the basis of previously obtained knowledge or actions. While solving the problem situations it becomes possible to form students' ideas about the logics of scientific cognition and the methodology of scientific research. Problem situations stimulate cognitive activity, provide the increasing of the interest in the learning process and contribute to the increase in the level of motivation of students to scientific research work. Thus, problem-based learning has a considerable potential in the process of formation of students' readiness for scientific research work.

The obtained results do not propose absolute solution of the problem under study. Therefore further research requires the development of the system of forming the future specialists' readiness for research work.

References

1. Прошкін В. Основні підходи до визначення поняття «науково-дослідна робота студентів» / В. Прошкін // Наукова скарбниця освіти Донеччини. – Вип. 2(5). – 2009. – С. 114 – 117.
2. Уйсімбаєва Н.В. Науково-дослідницька діяльність майбутнього фахівця / Н.В. Уйсімбаєва // Збірник наукових праць: Наукові записки. – Вип. 88. – Серія: Педагогічні науки. – Кіровоград: РВВКДПУ ім. В.Винниченка, 2010. – С. 243 – 246.

3. Woodhouse D. Auditing Research and the Research/ Teaching Nexus / D. Woodhouse // *New Zealand Journal of Educational Research*. – 2003. – Vol. 33. – P. 39 – 53.
4. Geiger R. Organized Research Units – Their Role in the Development of University Research / R. Geiger // *Journal of Higher Education*. – 1999. – Vol. 61. – P. 1 – 19.
5. Райхман Є. Науково-дослідна робота майбутніх магістрів педагогічної освіти як педагогічний феномен / Є. Райхман // *Вісник Дніпропетровського університету ім. А. Нобеля. Серія «Педагогіка і психологія. Педагогічні науки*. – 2015. – №1 (9). – С. 164 – 170.
6. Артемчук Г. І. Методика організації науково-дослідної роботи: навч. посіб. / Г. І. Артемчук, В. М. Курило, П. М. Кочерган. – К.: Форум, 2000. – 271 с.
7. Голуб Т. П. Інтеракція змісту науково-дослідницької роботи студентів і якості вищої технічної освіти / Т. П. Голуб // *Наука і освіта*. – 2011. – №6. – С. 51 – 54.
8. Спіцин Є.С., Чмихало І.В. Шляхи оптимізації організації науково-дослідної роботи студентів педвузу / Є.С. Спіцин, І.В. Чмихало // *Психолого-педагогічна підготовка вчителя іноземної мови в умовах перебудови школи: зб. наук. праць / за заг. ред. М.Б. Євтуха*. – К.: КДПШМ, 1990. – С. 117 – 125.
9. Ягенська Г. В. Співпраця вчителя і учнів у процесі науково-дослідницької роботи як шлях до саморозвитку особистості: матеріали наук.-метод. посіб. / Г. В. Ягенська // *Орієнтація на особистість*. – Луцьк, 2006. – С. 342 – 343.
10. Словник-довідник з професійної педагогіки / [ред.-упоряд. А. В. Семенова]. – Одеса: Пальміра, 2006. – 272 с.
11. Khodaparast Haghi A. New perspectives in engineering education: the promotion of traditional models to innovative solutions / Haghi A. Khodaparast // *Journal of Engineering Education*. – 2005 – №7(28). – P. 11 – 22.
12. Оконь В. Введение в общую дидактику / В. Оконь. – М.: Высшая школа, 1990. – 382 с.

13. Кудряцев Т.В. Проблемное обучение – истоки, сущность, перспективы / Т.В. Кудряцев. – М.: Знание, 1991. – 389 с.
14. Bruner J. S. Toward a Theory of Instruction / J.S. Bruner. – Cambridge, Mass.: Belkapp Press, 1966. – 176 p.
15. Габай Т.В. Учебная деятельность и ее средства / Т.В. Габай. – М.: Наука, 1988. – 224 с.
16. Barrows H. Problem Based Learning in Higher Education / H. Barrows. – New Directions for Teaching and Learning. – 1996. – №68. – Pp. 3 – 12.
17. Кларин М.В. Характерные черты исследовательского подхода: обучение на основе решения проблем / М.В. Кларин // Школьные технологии. – 2004. – №1. – С. 11 – 24.
18. Norton L. Innovatory Courses: Matching Lectures' Objectives with Students' Perceptions and Academic Performance / L. Norton, R. Horn, S. Thomas // Oxford: the Oxford Centre for Staff and Learning Development. – 2002. – Part X, Chapter 30. – P. 331 – 343.
19. Левина М.М. Технологии профессионального педагогического образования: Уч. пособ. для студ. высш. пед. учеб. завед. / М.М. Левина. – М.: Издательский центр «Академия», 2001. – 272 с.
20. Никитина Е.Ю. Формирование готовности студентов педагогического вуза к научно-исследовательской деятельности средствами проблемного обучения: Дисс. канд. пед. наук: 13.00.08 – теория и методика профессионального обучения / Е.Ю. Никитина. – Новокузнецк, 2007. – 202 с.