PSYCHOLOGICAL PRINCIPLES OF SOLVING PROFESSIONALLY AIMED SITUATIONS IN THE PROCESS OF PROBLEM-BASED LEARNING

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INTRODUCTION

The modern society raises new, higher demands on the professional competence of professionals. Professional activity requires a modern specialist to be competent in many issues, to be well versed in the character and behavior of a person, to be able to establish a favorable working atmosphere in the team, to maintain close cooperation with interacting structures, etc.

Among the professionally important qualities, the presence of which determines the success of the tasks, the ability to professional creativity is very important. Development and formation of sustainable skills for making creative and non-standard (atypical) decisions is one of the most important tasks of professional training at the present stage[1].

Problem-based learning has strong reservations about the professional competence of modern professionals, as it (along with traditional training) develops better in those who learn the ability to think creatively.

There is a need to investigate the features of the use of problem-based training in the training of a modern specialist.

When organizing the process of learning, it is necessary first of all to create conditions that would cause cognitive activity of the listener. Only under this condition the learning process will proceed in accordance with the basic pattern of learning, as the satisfaction of the cognitive need that constantly arises in the listener.

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[1] Shynkaruk O. M., Didenko O. V. (2017). *Problem-based learning of border guards: theory, methodology, practice:* a manual. Khmelnitsky: edition of the NASBGS, 67-68. [in Ukrainian].

One of the types of developmental learning, the essential difference of which is the convergence of psychology and thinking of a person with the psychology of the development of creative thinking of listeners is problem-based learning.

Overcoming intellectual difficulties and solving complex learning tasks stimulates the listener to a high level of development of thinking, creative opportunities and formation of a high level of professional competence.

1. The psychological analysis of Problem-Based Learning (PBL) and its impact on creative activity development

Nowadays it is impossible to overestimate the influence of PBL on development such distinctive features as creativity, broad-minding, good intellect etc.

PBL is a teaching method in which complex real-world problems are used as the vehicle to promote student learning of concepts and principles as opposed to direct presentation of facts and concepts. In addition to course content, PBL can promote the development of critical thinking skills, problem-solving abilities, and communication skills. It can also provide opportunities for working in groups, finding and evaluating research materials, and life-long learning[2].

PBL encourages students to apply their critical thinking and problem-solving skills to address real-world problems. It's a rich and engaging learning experience.

It differs from the traditional lecture-based approach, where teachers primarily provide students with information, also acting as facilitators who guide pupils through the learning process[3].

PBL as a psychological-pedagogical strategy appeals to many educators because it offers an instructional framework that supports active and group learning–premised on the belief that effective learning takes place when students both construct and co-construct ideas through social interactions and self-directed learning. Its

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[2] URL: https://citl.illinois.edu/citl-101/teaching-learning/resources/teaching-strategies/problem-based-learning-(pbl). Problem-based learning teaching-strategies

[3] URL: https://www.maastrichtuniversity.nl/education/why-um/problem-based-learning. Problem-based learning.

implementation can vary across institutions and programmes, but in general, it can be viewed as an iterative process made up of first, a problem analysis phase, a period of self-directed learning and lastly, a reporting phase. A tutor-also known as a facilitator-acts as a guide to scaffold students' learning, particularly in the problem analysis and reporting components of the PBL tutorial, as well as facilitate students' inquiry paths as they make sense of their ideas through discussion and sharing.

PBL has the potential to improve students' higher-order thinking skills, comprehension and application of knowledge, learning attitudes and motivation" and may also encourage students to accept more responsibility for their learning.

In a typical PBL setting, learning is triggered by a problem which needs resolution. Dewey explains the cognitive element of learner engagement by describing how the origin of thinking is some "perplexity, confusion, or doubt" that is triggered by "something specific which occasions and evokes it." Students make connections to this "perplexity, confusion, or doubt" by activating their individual and collective prior knowledge and finding resources to make sense of the phenomenon; they also engage in peer learning through small-group discussions and consolidate their learning through reflective writing. Beyond enabling students to make sense of the concepts and subject matter, this learning experience is also likely to help students "develop understandings of themselves and their contexts, and the ways and situations in which they learn effectively".

PBL provides the following opportunities:
- examine and try out what you know;
- discover what you need to learn;
- develop your people skills for achieving higher performance in teams;
- improve your communications skills;
- state and defend positions with evidence and sound argument;
- become more flexible in processing information and meeting obligations;
- practice skills that you will need after your education.

PBL teaches to:
- really understand the subject matter, rather just learning by rote;

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- collaborate with partners and small teams;
- think critically with a view to solving problems;
- study and work independently;
- feel comfortable with public speaking[4].

PBL helps to develops critical thinking and creative skills, to improve problem-solving skills, increase motivation and to help students learn to transfer knowledge to new situations

The core problems will vary among disciplines. There are some characteristics of good PBL problems that transcend fields[5]:

A. The problem must motivate students to seek out a deeper understanding of concepts.

B. The problem should require students to make reasoned decisions and to defend them.

C. The problem should incorporate the content objectives in such a way as to connect it to previous courses/knowledge.

D. If used for a group project, the problem needs a level of complexity to ensure that the students must work together to solve it.

E. If used for a multistage project, the initial steps of the problem should be open-ended and engaging to draw students into the problem.

The method for distributing a PBL problem falls under three closely related teaching techniques: case studies, role-plays, and simulations. Case studies are presented to students in written form. Role-plays have students improvise scenes based on character descriptions given. Today, simulations often involve computer-based programs. Regardless of which technique is used, the heart of the method remains the same: the real-world problem[6].

We'd like to present the following steps in the PBL which characterize the whole process:

1. Read the problem and define any terms
2. Discuss the focus and the scope of the problem/scenario

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[4] URL: https://www.studygs.net/pbl.htm. Problem-based learning (PBL) is an exciting alternative to traditional classroom learning.

[5] Duch B. J., Groh S. E. & Allen D. E. (2001) The Power of Problem-Based Learning, New York Edition. 112–113.

[6] Molyako V. A. (2003) *Schoolchildren psychology of creative problems solving*. Kyiv: Glad. Publ. 78–79 [in Ukrainian].

3. Discuss the issues raised in the problem focus and their implication for the problem/scenario (Brainstorm the collective knowledge within the group about the issues)

4. Organize information into themes:

5. Set learning objectives

6. Access resources to answer learning objectives

7. Apply the knowledge to the problem scenario and feedback to the group and testing of new knowledge[7].

Now, we'd like to mention the advantages of PBL, so they are as follows:

− it can encourage higher order critical thinking and de-emphasize memorization;

− it can help student learn what is relevant to the real world;

− it can increase motivation to learn and arrive at a solution;

− it can provide opportunities for students to collaborate and practice their communication and social skills;

− it can help students understand how to learn[8].

Education world suggests that teachers can implement PBL by getting students to work on problems affecting the neighborhood or school community, such as an ongoing litter problem, or by asking students to identify problems in the area, depending on their age and experience with problem-based learning[9].

"Once you have selected a problem, gather your students to discuss project goals, deadlines and materials, and to brainstorm some action steps for the project. Make sure your assignment has no one right answer. Let your students drive the discussion and do the real, "messy" work-your job is to offer gentle direction and answer questions"[10]. Despite the potential benefits PBL can bring to the

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[7] URL: https://www.learning-theories.com/problem-based-learning-pbl.html. Problem-based learning learning-theories.

[8] URL: https://www.forbes.com/sites/michaeltnietzel/2019/10/29/new-strong-evidence-for-problem-based-learning/#2f9c67e86ab8.New-strong-evidence-for-problem-based-learning.

[9] URL: https://www.sciencedirect.com/science/article/pii/S2452301116300062. Problem-Based Learning: An Overview of its Process and Impact on Learning.

[10] URL: https://www.studyinternational.com/news/problem-based-learning-in-the-classroom-yay-or-nay. Problem-based-learning-in-the-classroom-yay-or-nay.

classroom, studies suggest that incorporating PBL can pose some teaching challenges.

In order to reach the full potential of PBL, the curriculum needs to be designed to meet the specific instructional needs and constraints of the students, such as their ability to be self-directed in their learning[11].

Both teachers and students who are new to the responsibilities of this open-ended learning environment will need time to adjust to their changing roles, adding that studies suggest designing effective PBL problems is time-consuming and research-intensive process[12].

This adds to teachers' stress levels, and potentially reduces their desire to implement PBL in the classroom. To boot, students who do not fare well in self-directed learning may pose another challenge.

2. Psychological analysis of mechanisms for solving problem situations

The main feature of problem learning is the deliberate use by the teacher of problem situations that arise out of his/her will (objectively) and situations created by them specifically.

The peculiarities of organizing the problem-based learning process are that the main element of the first and second stages of learning is the problem situation – the main means of activating students' mental activity.

There are two concepts in the literature on problem-based learning: "emergence" and "creation" of problem situations. First, a problematic situation for the listener always arises, for the teacher there are no problematic situations, there can be only methodological (psychological and pedagogical) difficulties[13, 14].

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[11] URL: https://doi.org/10.1016/j.hpe.2016.01.004. The theory of problem-based-learning.

[12] URL: https://www.wits.ac.za/therapeuticsciences/occupational-therapy/about-us/problem-based-learning. Occupational-therapy.

[13] Bruner J. (1977). *Psychology of knowledge. Beyond direct information*. trans. from English. Moscow: Progress Publ. 223–224 [in Ukrainian]

[14] Grishko-Dunaevskaya V. A. (2016). *Features of subject-subject interaction in the process of learning a foreign language in higher military educational institutions*. Khmelnytskyi. : dissertation author's abstract on obtaining a scientific degree of candidate of psychological sciences, 6. [in Ukrainian].

Secondly, the problematic situation is generated by the educational or practical situation, the logic of the subject; they arise, as a rule, regardless of the desire of the teacher, i.e. objectively. Similarly, they can occur according to the logic of the educational process because of the rules of didactics of the sequence of actions of the teacher and the students. Typically, such situations are the result of the teacher asking questions or problems that prove to be problematic. However, the teacher may not even be aware of the psychological nature of this phenomenon[15]. Questions and tasks can be posed for a different purpose (to attract the attention of the listener, to find out if he has mastered the material, etc.), but, however, cause a problematic situation. Occurrence of it regardless of purposeful actions of the teacher is a completely natural phenomenon of the learning process[16]. Such situations, no doubt, activate the mental activity of the students, but this activation is not systematic, it has always been in the educational process. Problem situations can be created by the teacher intentionally, if he knows the rules of organization of problem-based learning[17].

Purposeful use by the teacher of problem situations that arise in addition to his desire (objectively) and situations intentionally created by them, are a system whose skillful application is the main feature of problem-based learning and its difference from traditional one[18, 19].

The teacher A. M. Matyushkin formulated six rules for creating problem situations, four rules for managing the process of assimilation in a problem situation. These problem-based learning rules can serve

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[15] Vygotsky L. S. (1982). *The problem of will and its development in a child's age*. Vol. 3, 452–455. [in Ukrainian].

[16] Antonenko T. L. (2019). *Psychological bases of formation of value-semantic sphere of personality of the future specialist*, K.: dissertation author's abstract on obtaining scientific degree of doctor of psychological sciences, 38–39. [in Ukrainian].

[17] Ivanova L. (1988) *Increasing of students' cognitive activity.* Public education, 4. 42–47 [in Russian].

[18] Baranovska L. V. (2015). *Pedagogy and Psychology of Higher School*: Educ. Manual. Kyiv: NAS Publ. 223–225 [in Ukrainian].

[19] Zhitko T. (2002). *Learning Methods – Precondition for Intellectual Development of Personality.* Native School, 6, 72–77 [in Ukrainian].

as didactic recommendations to the teacher in organizing the problem-based learning process[20, 21].

Didactically and methodologically sound ways of creating problematic situations can be found only if the teacher knows the general patterns of their occurrence. There are attempts to formulate these patterns on problem-based learning in the literature in the form of types of problem situations[22].

A broad typology of problematic situations was suggested by T. V. Kudryavtsev. As practice shows, all the diversity of contradictions contained in teaching material can be expressed by only a few types of educational problem situations as a more general concept of pedagogical psychology[23].

As the studies have shown, we can distinguish the most typical two types of problem situations common to all subjects.

The first type should be considered the most common: the problem situation arises if the listeners do not know how to solve the task, cannot answer the problem questions, to explain the new fact in the educational or life situation, that is, if the students are aware of insufficient knowledge for an explanation of the new fact[24].

The second type – problem situations arise when students are confronted with the need to use previously learned knowledge in new practical conditions. As a rule, teachers arrange these conditions not only to enable students to apply their knowledge in practice, but also to face the fact of their insufficiency. Awareness of this fact gives students a cognitive interest and stimulates the search for new knowledge[25, 26].

[20] Matyushkin A. M (2003). *Thinking, training, creativity.* Moscow: Moscow Ed. Psychol. Soc. Inst; Voronezh: MODEK Publ. 615–616 [in Russian].

[21] Matyushkin A. M. (1972). *Problem situations in thinking and learning.* Moscow: Pedagogy Publ. 78-80 [in Russian].

[22] Kostiuk, G. S. (1969). *Princip razvitiya v psihologii* [The principle of uncertainty in the psychology of choice and risk. Methodological and theoretical problems of psychology]. Moscow: Nauka Publ. [in Russian].

[23] Kudryavtsev T. V. (1987). *Issues of psychology and didactics of problem learning. Problem education.* Moscow: Enlightenment Publ. 145-148. [in Russian]

[24] Ilnitskaya I. Ya. (1985). *Problem situations and ways to create them in a lesson.* Moscow: Knowledge Publ. 57–59. [in Ukrainian]

[25] Lerner I. Ya. (1974). *Problem-based learning.* Moscow. 128–129. [in Russian]

The third type – a problem situation easily arises if there is a contradiction between the theoretically possible way of solving the problem and the practical impracticability of the chosen method.

The fourth type – a problematic situation arises when there is a contradiction between the virtually achieved result of the completion of the study task, the lack of knowledge of the students for its theoretical substantiation.

Opportunities to manage the learning process are that the problematic situation in its psychological structure has not only a substantively meaningful, but also a motivational personal side (the listener's interests, desires, needs, opportunities, etc.)[27, 28].

The following didactic goals can be noted:

a) to draw the listener's attention to the issue, the task, the educational material, to arouse his cognitive interest and other motives of activity;

b) to put him (her) in the face of such severe cognitive difficulties, which overcoming it would activate mental activity;

c) to open to the listeners the contradictions between the cognitive need and the impossibility of satisfying it, with the help of the available stock of knowledge, skills, habits;

d) to help him to identify in the cognitive task, issue, task the main problem and to outline a plan for finding ways out of the problem; to encourage the student to actively search;

e) to help him to update the previously learned knowledge and to show the direction of finding the most rational way out of the situation of difficulty[29, 30].

Based on the generalization of good pedagogical experience, there are several basic ways to deal with problem situations. These methods

[26] Makhmutov M. I. (1975). *Problem-Based learning*. Moscow. [in Russian]

[27] Romanyuk I. M., Bogaychuk V. J. (2011). *Problem studying-one of the effective methods of searching-cognitive activity of cadets (listeners)*, Bulletin of the National University of Defense of Ukraine, 6 (25). 47–55. [in Ukrainian]

[28] Smirnov S. D. (2003). *Pedagogy and Psychology of Higher Education: From Activity to Personality*. Moscow: Academy Publ. 125-126. [in Russian]

[29] Selevko G. K. (1998). *Modern educational technologies*: textbook. Manual. Moscow. 147-149. [in Ukrainian]

[30] Sliepkan Z. I. (2005). *Scientific principles of pedagogical process in higher education*: a textbook. Kyiv: High school Publ. 145-146. [in Russian]

are chosen by the teacher on the basis of their knowledge of the conditions of occurrence of different types of problem situations. A form of implementation of this or that method is such didactic techniques as the formulation of a problem question, task, problem task, demonstration of experience.

The first way is to involve the students in the theoretical explanation of the phenomena, objects, external discrepancy between them. This leads to search activities and to the active acquisition of new knowledge.

The second way is to use learning and life situations that arise when students perform practical tasks, as a result of observations of nature, etc. Problematic situations in this case arise when students try to independently achieve their practical goals . Usually, students formulate the problem themselves at the end of the situation analysis.

The third way is to set educational problem tasks to explain the phenomena or to find ways of their practical application. An example would be any student research work at a study site, laboratory or office, as well as in a lesson.

The fourth way is to involve the students in the analysis of the facts and phenomena of reality that give rise to the contradictions between the ideas of life and the search concepts of these facts.

Fifth way – to make assumptions (hypotheses), formulate the results and test them.

The sixth way is to involve students in comparing, contrasting and contrasting the facts, phenomena, rules, actions that result in a problematic situation.

The seventh way is to involve students in the pre-summarization of new facts. The students are tasked with looking at some facts, phenomena that exist in the new material for them, comparing them with the known ones and making an independent generalization. In this case, as a rule, there is a problematic situation, as the comparison reveals the special qualities of new facts, their explanations are unclear.

Eighth way – students are introduced to facts that are incomprehensible and that have led the history of science to the scientific problem. Usually, these facts and phenomena seem to deny those concepts and ideas that students have formed, which are explained by the lack of their previous knowledge.

The ninth way is to organize cross-curricular links. Often the material of the subject being studied does not provide a problem situation (when developing skills or repeating previous material, etc.). In this case, the facts and data of the sciences (subjects) that are relevant to the material being studied are used.

The tenth way is to vary the task, reformulate the question.

The problematic task should correspond to the level of development of the mental abilities of the listener, to proceed from the logic of the educational material, and the main thing – to be perceived by the listener as a natural difficulty, the overcoming of which is necessary. To raise the level of mental activity of the listener, it is necessary to gradually complicate cognitive tasks and their degree of independence in the solution.

In problem-based learning, it is necessary to create the most favorable conditions for the speech self-realization of the students through the introduction into practice of creative exercises, research tasks, problematic issues, etc. The primary task at the same time is the awakening of cognitive activity[31]. Cognitive activity at the level of the structural unit of personality orientation indicates that the listener not only willingly assimilated one or another information, but is distinguished by a strong need for quality cognitive activity, strong and persistent motives for this activity. Techniques that put the listener in an active position in the classroom include a number of learning situations: first of all, situations in which the listener must defend his or her opinion; situations that prompt students to ask a teacher or classmate; reviewing the responses, creative work of other students in the classroom and after-school activities; performing tasks designed to use additional literature; free choice of tasks, mainly of a search character; creating a situation of exchange of educational information among students; self-examination, analysis of own cognitive works. The indicator of the formed cognitive activity of the listeners can be primarily their actions. In particular, if the listener asks a question to the teacher; seeks, at its own request, to participate in educational activities, to discuss issues discussed at the lesson; complements the answers of other listeners, wishes to express his/her views; seeks to

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[31] Fitsula M. M. (2006). *Pedagogy of the Higher School*: Educ. Tutorial. Kyiv. Academ. Edit., 312-313. [in Russian]

share new information with others, complete the exercise started, in this case we can talk about his advanced cognitive activity.

3. Use of the mechanism of defining the educational task
in the process of solving problem situations

We call problematic any situation, practical or theoretical, in which there is no obvious decision appropriate to circumstances and that is why it requires stopping and thinking. Depending on how the situation is perceived by the subject, he or she does or does not actually perform setting of the problem. We can assume that the transition from a problem situation to a task is caused by a special manifestation of the subject's activity – over situational activity, which characterizes the tendency of the subject to act above the threshold of external or internal situational necessity, go beyond the initial situation[32]

In its most general form, the task is a system, which mandatory components are:

1) The object of the problem, which is in the initial state;

2) A model of the desired state of the object of the problem, which is identified with the requirements of the problem[33, 34].

The problem G. O. Ball differs from a task (problematic) situation – a set of objects that allows a systematic representation in the form of a problem, but one that has not yet received such a representation. He also distinguishes it from the problem by its sign model, the partial case of which is a verbal description (formulation)[35].

[32] Okon V. (1988). *Fundamentals of problem-based learning*. Moscow. [in Russian].

[33] Ball G. O. (1990) *The theory of learning tasks*: *Psychological-Pedagogical Aspect*. Moscow: Pedagogics Publ. 165-167. [in Russian]

[34] Smulson M. L. (2019) *Adult development in the modern transitive world* Topical problems of psychology: Collection of scientific works of the G. S. Kostyuk Institute of Psychology of the National Academy of Pedagogical Sciences of Ukraine. 2019. Volume VIII: Psychological Theory and Technology of Learning. Issue 10. 328. [in Russian]

[35] Smulson M. L.(2009). *Intelekt i mentalni modeli svitu* [Intellect and mental models of the world]. *Naukovi doslidzhennia kohnityvnoi psykholohii – Scientific and cognitive psychology*. Ostroh: Natsionalnoho universytetu "Ostroh" Publ., vol. 12, 38–49 [in Ukrainian]

Petrovskyi V. A. distinguishes 2 levels of such activity: the phenomenon of "supersituation", that is, the redundancy of the subject's actions in relation to those requirements of the situation, which determine the criteria for the effectiveness of his behavior and are taken as primary data, as well as "counter-situation" when the subject acts contrary to the constraints that restrict his/her free development.

The main feature of the phenomena of super-situational activity is that "the subject, acting in the direction of realization of the initial requirements of the situation, goes beyond these requirements; the moments of activity appear at the same time as if they were separated in the facts of the subject's "going beyond the limits of the situation". Such "going beyond" the problem situation is observed, in our opinion, in the transition of the subject (group) to independent formulation of the problem and attempts to solve it[36].

Therefore, the statement (vision) of the problem in a problem situation is one of the manifestations of supersituative activity, as well as active intelligence, or, according to D. B. Bogoyavlenskaya (1983), the intellectual activity of the individual. The tasking stage needs to be considered in all tasks, but especially in those that arise in practical work. Finding a future challenge – a problematic situation – is one of the most important properties of an intelligence practitioner – a professional. The task (problematic) situation is often not fully understood and exists to the extent that it, figuratively speaking, is the "present" person who invented it[37].

The task differs from the task (problem) situation in that it is conscious by the subject, objectified and most often described verbally or in another sign (numeric, graphic form). The problem statement contains its analysis and understanding at a certain level, preliminary definition of the conception of the decision, strategy, plan of action. It, as a rule, involves taking into account the possible realistically available and present means of solving the problem (i.e. material,

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[36] Petrovskyi V. A. (1992) *Psychology of over adaptive activity*, Moscow. 152–154. [in Russian].

[37] Bogoyavlenskaya D. B. (1983). *Intellectual activity as a problem of creativity.* Rostov, Publ. Rostov Univers. 174. [in Russian]

materialized and ideal objects that are not directly included in the conditions of the problem, but are involved in solving it)[38, 39].

An educational task is a task aimed at the achievement of learning goals, which is put forward by the teacher or the student sets himself.

Explicit include tasks that clearly state the condition and require explicit, that is, external, response. The implicit include tasks that do not have a clear condition and do not require a clear answer, and which are often used to stimulate the listener's internal dialogue, reflection of his or her activity, teacher's activity, or peculiarities of the functioning of the educational system.

The educational task is understood quite broadly, along with the thinking, there are also mnemonic, perceptual tasks, as well as tasks for understanding. Learning tasks are components of both educational and learning activities (in the latter it acts as a learning influence)[40].

Definition of a learning task (learning influence) – can be considered as a special case of psychological mechanism of task definition, which takes place in any management system, in which a person is the object. Its specific feature is primarily due to the fact that the educational task occupies a different place in the structure of the students' activity than, for example, a production or scientific task in the activity of the respective specialists. Here, the solution does not meet the educational goal, but acts only as a means of achieving it, and to achieve even the closest goal (learning a certain mode of action, that is, a method of solving a certain class of problems) requires the solution of not one task, but a set of problems.

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[38] Smulson M. L. & oth. (2015). *Intelektualnyi rozvytok doroslykh u virtualnomu osvitnomu prostori: monohrafiia* [Adult intellectual development in the virtual educational space: a monograph]. Kyiv: Pedahohichna dumka. Publ. Retrieved from: http://lib.iitta.gov.ua/10064 [in Ukrainian]

[39] Furman A. V. (1987) *Application of the problem situation* // Sov. Pedagogy, № 3. 17–21. [in Russian]

[40] Smulson M. L. (2016). Rozvytok intelektu ta subiektnosti doroslykh u virtualnomu prostori [The development of adult intelligence and subjectness in virtual space]. *Tekhnolohii rozvytku intelektu – Technologies of Intellectual Development,* vol. 2, 2(13). Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/issue/view/18 [in Ukrainian]

The essence of this psychological mechanism can be formulated in the following way: any learning influence on the part of the teacher in the form of a task (the main learning influence), explicit or implicit, subjected to the students processing, resulting in a discrepancy between the task posed by the teacher, and in fact one solved by the listener[41].

This psychological mechanism of learning reflects primarily the features of internal determination: under the influence of various factors (both motivational and intellectual), the listener transforms the task from the outside (task situation) into a task in the psychological sense.

Thus, a definite task can be imagined as a projection to the task externally actualized goals of the subject-motives (it reflects both the personal meaning of the trainees, as well as certain situational factors), as well as intellectual property (abilities, habits and knowledge, the subjective world as a whole). Regarding learning tasks, the principle is as follows: the goals must be aligned with the learning goals when solving problems. In the process of defining a task, the listener firstly sets a specific goal (sometimes, even without being fully aware of it), and secondly, sets his own requirements for the process and the product of its solution.

The theoretical significance of the psychological mechanism of defining the educational task is, first of all, that it makes it possible to scientifically substantiate the following position: even in the conditions of rigidly determined training, the student acts not only as an object of management, but also as a subject of educational activity. After all, he/she determines the nature of the projection to the task externally, and thus actually solved the problem. The fundamental importance of this provision is that it demonstrates the scientific failure of a behaviorist approach to learning, which plays a decisive role in the system of rewards and punishments. While not denying the importance of rewards and punishments in the educational process, we also

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[41] Smulson M. L. (2014). Psykholohichni mekhanizmy v kontseptsii navchannia Yu.I. Mashbytsia [Psychological Mechanisms in the Concept of Teaching YI Mashbits]. *Tekhnolohii rozvytku intelektu – Intellectual Development Technologies,* vol. 1, 6. Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/article/view/123 [in Ukrainian]

emphasize the incorrectness of giving them a decisive role and essentially reducing the personality of the listener to the object of manipulation. Solving the external task, the listener remains essentially the subject of his/her activity, because he/she defines this task.

If the learner does not correlate his/her solution to the learning goals when solving a problem, his/her activity cannot be considered as an educational task, although he/she fulfills an important requirement when solving a learning problem: the student uses only available means of solving problems[42, 43].

It cannot be said that the didactic effect will always be zero. He may spontaneously memorize some of the techniques for solving a given task that are typical of a particular class, and after a while, when solving another task, the listener may recall that technique and generalize it. In doing so, he may even unknowingly relate the solution of the problem to such a learning purpose as mastering a particular way of solving the problem. However, it is of fundamental importance that the latter is accomplished in the solution of another problem, and here it has to be determined[44, 45].

In the light of this psychological mechanism, the definition of a learning task can be justified by the well-known proposition that the student begins to solve the learning problem only when he/she sees in it his/her personal meaning. At first glance, it may seem that solving a typical learning problem may not make personal sense. Undoubtedly,

[42] Smulson M. L. (2016). Rozvytok intelektu ta subiektnosti doroslykh u virtualnomu prostori [The development of adult intelligence and subjectness in virtual space]. *Tekhnolohii rozvytku intelektu – Technologies of Intellectual Development,* vol. 2, 2(13). Retrieved from: http://psytir.org.ua/index.php/technology_intellect_develop/issue/view/18 [in Ukrainian]

[43] Smulson M. L. (2003). *Psykholohiia rozvytku intelektu* [Psychology of Development of Intellect]. Kyiv: Nora-Druk Publ. [in Ukrainian]

[44] Smulson M. L. & oth. (2015). *Intelektualnyi rozvytok doroslykh u virtualnomu osvitnomu prostori: monohrafiia* [Adult intellectual development in the virtual educational space: a monograph]. Kyiv: Pedahohichna dumka. Publ. Retrieved from: http://lib.iitta.gov.ua/10064 [in Ukrainian]

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such a task does not make sense to the listener if it limits the listener's purpose to find what he/she is looking for. But, as stated above, in the process of defining a given task from the outside, the student correlates it with the current educational goals for him/her. A learning task acquires a personal meaning for the listener because he / she is aware that the solution of this task ensures the achievement of a certain educational goal or at least promotes it[46].

Thus, the student's learning activities are not limited in any way to the solution of the tasks set by the teacher. The latter act as specific task situations for him/her and the listener greatly expands the range of these situations by setting and solving various learning tasks. Without any exaggeration, it can be argued that a great role in the activity of the listener is the independent formulation and solution of various learning tasks. In other words, it is the activity of the listener in the world of learning tasks[47].

The mechanism of defining the educational task reveals new limits of the study of the psychological development of the listener, the source of his/her self-development. One of the most important components of the personal development of listeners is the development of content, first of all, personal content. These changes reflect the development of the intentional side of activity, which in turn characterizes the orientation of the individual, and the content system, as emphasized by D. O. Leontiev, ensures correspondence of the activity to the intentional sphere of personality, coordinating the tasks of the activity with motives, needs, values, and attitudes of the listerner[48].

We believe that students 'determination of learning tasks, manifested in the extension of the cognitive field given by the teacher, which defines the system of tasks, is one of the most important sources

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[46] Mashbyts, Yu. I. (2019). *Psykholohichni mekhanizmy i tekhnolohiia navchannia* [Psychological mechanisms and technology of teaching]. Kyiv: Interservis Publ. [in Ukrainian]

[47] Rybalka V. V. (1996) *Psychology of creative personality development: a textbook*. Kyiv: MOD Publ. 155–157. [in Russian]

[48] Leontiev, D. A. (2013). Lichnostnoe izmerenie chelovecheskogo razvitiya [The personal dimension of human development]. *Voprosy psihologii – Psychological issues*, 3, 67–80 [in Russian]

of students' self-development. Constructing the learner a task space characterizes not only the learning activity but also his/her personality, above all the cognitive, motivational and will spheres.

This leads to an important conclusion: the teacher should stimulate the students not only to such a definition of tasks, which is based on the variation of certain subject content, but also to the formulation and solution of tasks to reflect one's activity[49]. The most appropriate form of learning is the intellectual training of listeners, which promotes that the students' awareness of their mental structures acts as a direct product of their actions.

Therefore, in our opinion, one of the areas of the restructuring of the education system is the widespread use of problem-based learning, which should take a prominent place in daily educational work with students.

CONCLUSIONS

To sum up, PBL has the potential to improve students' higher-order thinking skills, comprehension and application of knowledge, learning attitudes and motivation. This learning experience helps students to develop understandings of themselves and their contexts, and the ways and situations in which they learn effectively.

The peculiarity of organizing the problem-based learning process is the problem situation – the main means of activating students' mental activity.

Purposeful use by the teacher of problem situations that arise in addition to his/her desire (objectively) and situations intentionally created by them, are a system whose skillful application is the main feature of problem-based learning and its difference from traditional one.

In problem-based learning, it is necessary to create the most favorable conditions for the speech self-realization of the students through the introduction into practice of creative exercises, research tasks, problematic issues, etc. The primary task at the same time is the awakening of cognitive activity.

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[49] Mashbyts, Yu. I. (1997). *The basis of new information technologies of studying. Kiev:* H. S. Kostiuk Institute of Psychology of the National Academy of Pedagogical Sciences of Ukraine, 46–49. [in Ukrainian]

The transition from a problem situation to a task is caused by a special manifestation of the subject's activity – over situational activity, which characterizes the tendency of the subject to act above the threshold of external or internal situational necessity.

An educational task is a task aimed at the achievement of learning goals, which is put forward by the teacher or the student sets himself. The educational task is understood quite broadly, along with the thinking, there are also mnemonic, perceptual tasks, as well as tasks for understanding. Learning tasks are components of both educational and learning activities

Any learning influence on the part of the teacher in the form of a task (the main learning influence), explicit or implicit, subjected to the students processing, resulting in a discrepancy between the task posed by the teacher, and in fact one solved by the listener.

The mechanism of defining the educational task reveals new limits of the study of the psychological development of the listener, the source of his/her self-development.

Students 'determination of learning tasks, manifested in the extension of the cognitive field given by the teacher, which defines the system of tasks, is one of the most important sources of students' self-development.

the teacher should stimulate the students not only to such a definition of tasks, which is based on the variation of certain subject content, but also to the formulation and solution of tasks to reflect one's activity.

SUMMARY

The article is devoted to the peculiarities of using of problem-based learning in the training system.

A detailed analysis of the organization conditions of the educational process has been carried out. The requirements have been revealed which allow positive results' achievement when performing problematic tasks. Characteristics of problem-based learning, main principles and components of problem situations have been formulated.

A detailed psychological analysis of the mechanisms of problematic situations solving , peculiarities of organization of problem learning process has been carried out.

Use of the mechanism of defining the educational task in the process of solving problem situations has been worked out in detail. It is proved that students' awareness of their mental structures acts as a direct product of their subsequent actions.

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