

LEARNING PROBLEMS DURING QUARANTINE MEASURES IN THE COURSE "SCIENTIFIC RESEARCH METHODOLOGY"

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Summary

The use of problem-based learning in higher education institutions during quarantine restrictions involves the creation and development of problem situations with their subsequent solution by students in group cooperation. This approach involves working out a high level of self-organization in students, and from the teacher – work to improve methodological skills in the new educational environment. This determined the relevance of the presented research. The conditions created by the COVID-19 pandemic required from all participants in the educational process significant changes in the organization, technical and methodological support of quality educational process, where priority was given to work with generalized knowledge and basic principles of problem solving. The subject of the research is problem-based learning as an interactive pedagogical technology that is able to provide quality higher professional education in conditions of quarantine restrictions during the teaching of the course "Research Methodology". The research methodology is based on an integrated approach. Descriptive method, as well as analysis and synthesis are used for the analysis of theoretical and methodological investigations. The paper also uses comparative-historical, comparative methods. In addition, the consideration of research issues is based on an interdisciplinary approach. The result of the study is the establishment of evolutionary changes in the problem-based approach used in the course "Methodology of Scientific Research" under quarantine restrictions. Using a problem-based approach in this course is a comprehensive approach to online learning. This will allow students to effectively use research methods, support research activity, independence of thinking and activities in conditions of quarantine restrictions.

Keywords: higher education, pandemic, problem approach, COVID-19, training course.

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1. Introduction

The idea of problem-based learning involves first of all an appeal to educational activities, where a problem situation is created and solutions are found as a result of group activities of students and teachers. An important condition for the successful application of this technology is reliance on students' independence in work, self-organization and the ability to plan and systematize. Thus, the learning process actively uses cognitive capabilities, accustoms to scientific research. This skill is one of the leading within the discipline "Methodology of Scientific Research", the question of working on the development of creative thinking, research approach in difficult conditions remains open (*Manko, 2006:102*).

Quality professional education in a higher education institution is designed to implement a number of tasks. First, to form in students, defined by the work program, system of knowledge, skills and abilities. Secondly, it is necessary to achieve a high level of development of professional competencies, as well as skills of self-education and self-organization. All these educational tasks are the core of the course "Research Methodology", and a problem-based approach with great success can help to learn the material, implement the educational objectives of the course, the processes of active research activities of students.

2. Distance education of the 21st century at Covid-19

The training course with the declared subject is a complex of problem lectures (seminars), problem-cognitive tasks that require the realization of creative aspirations of students.

A number of current studies (*Kumar; Somani, 2020*) have taken an active position on the need to include a problem component in learning, which, due to the quarantine restrictions of the COVID-19 pandemic, can be done online, remotely. Researchers (*Kumar; Somani, 2020*) associate the concept of "problem" with a certain algorithm of action: the problem and its establishment in the classroom; formulation of the educational problem in accordance with the declared topic; finding ways to solve it; selection of the most optimal solution to the problem, implementation; analysis of the effectiveness of the decision, summarizing; if necessary, adjustments in approaches to the decision.

Following WHO recommendations, most higher education institutions switched to online learning in 2019/2020. These changes have significantly affected all academic communities, as well as their motivation, psychological state, willingness to continue their studies. A number of studies in psychology presented results that showed changes in mood in a constant mode of distance learning (within a few weeks, a positive attitude changed to negative, frustration and phobias) (*Huang, et al 2020*).

There are a large number of studies that consider medical education as a crisis because distance learning has negatively affected it (*Galea, et al 2020:817*). The nurses were concerned about the health effects of the coronavirus, the ability to study and work. Such anxiety causes stress, depression. Online learning can be uninteresting, even annoying monotony, a lot of external barriers (poor communication, lack of necessary technical equipment), it reduces student motivation, negatively affects the quality of learning (*Galea, et al 2020:818*). Psychological problems of students, administrative difficulties, abrupt changes in the learning rhythm, restructuring of social conditions in universities – all must be changed to reduce the damage caused by quarantine restrictions on education (*Bao, et al 2020:37*). At the same time, researchers often view the psychological difficulties of perceiving quarantine restrictions as a phenomenon that causes panic, phobias against the background of fear for their own health. Lack of interpersonal communication, physical distancing policies and prohibition systems are also considered to complicate the learning process in quarantine languages (*Galea, et al 2020:818*). Online learning encourages students to communicate through gadgets, makes interaction between a person and other people devoid of nonsense of nonverbal communication. The search for interactive methods and technologically possible teaching methods is very important.

Requirements for education in the XXI century require the introduction of such educational technologies that allow students to use in further activities the knowledge and skills acquired during the course. Students must take an active part in the educational process, meaningfully apply educational technologies, cooperate.

3. Problem-based learning as a pedagogical approach

According to some researchers, problem-based learning is a pedagogical approach that can be used as a learning tool for a student-centered learning model, where learners develop and solve real, poorly structured problems that need further research and streamlining (Jonassen, Hung, 2008). Researchers (Barrows, 1996:4) consider gaps in knowledge and lack of skills that become apparent during training to be motivated to use problem-based learning. Possibility of cooperation in research, skills of group work in development of decisions and presentation of results help to increase interest in a training course, better motivate to research activity.

In research positions, the positive features of problem-based learning are the ability to develop problem-solving skills (Norman and Schmidt, 1992:557), acquire metacognitive skills (Gijbels, et al. 2005:27), actively engage in learning and improve intrinsic motivation (Dochy et al., 2003:533). There are a number of works in which the algorithm of introduction of problem-based learning in education is developed. It is also intended for those educators who, due to lack of knowledge or confidence in their abilities, refuse to use new methods and forms in their own training courses (Ertmer & Simons, 2006).

The great potential benefits of problem-based learning and the quarantine constraints faced by university professors have helped to draw on the experience of using this type of innovation. Further quarantine restrictions encourage the further development of methods that are well adapted to distance and online learning.

An important condition for maintaining the quality of higher education, and especially the second (master's) level of education is the development of the ability to self-organize and plan learning, as well as improving creative potential, where the teacher must take into account individual characteristics. The simulated problem situation should meet the scientific interests of all participants and should be feasible for them. This is how the course "Methodology of Scientific Research", which is taught at the second (master's level) of higher education, should look like.

4. Organization of problem-based learning

Problem-based learning has a certain organizational sequence, which requires the teacher to conduct careful preparatory work within a clear organization of the educational process.

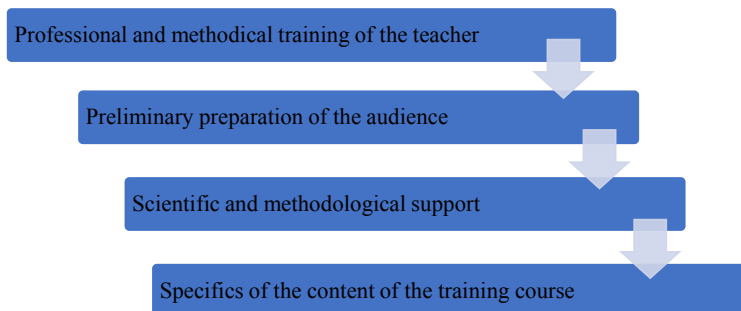


Fig. 1. Algorithm for organizing problem-based learning (author's development)

1. Training and methodological skills of the teacher is based on a high level of mastery of the content of the course. The teacher must be well acquainted with and master the techniques of problem-based learning (ability to motivate, skills of discussion and dialogue, communication skills). The teacher must also have organizational and pedagogical skills (listen, accept hypotheses, analyze in a group, have a constructive dialogue).

2. Preliminary preparation of the audience (students). This is primarily the presence of a topic that is interesting from a professional point of view for students, the student must also be motivated to the problematic presentation of the material. It is also important for the master to master the techniques of analytical activities, a set of theoretical knowledge on the topic, the ability to work on finding the result or by solving a problem, performing a task.

3. Scientific and methodological support involves the preparation of material and technical, methodological, cognitive and semantic conditions in the educational process of the problem situation until its solution.

4. Specifics of the content of the training course. These are primarily external factors that also significantly affect the educational process, especially in limited quarantine conditions (topic study time, learning platform, topics).

It is also necessary to acquaint students and define the key components of problem-based learning (problem lecture, problem task, problem situation, problem question).

Seminars and workshops can also be organized as problem-based learning online. In the course of such educational work, masters work on solving problem situations, for this they solve problems, seek solutions to problems.

One of the important positions of problem-based learning is the preparation of questions and tasks that require reflection, formation of one's own opinion, activation of analytical skills. For example, the course presents the following: Is it possible to be born a researcher? What research can be considered qualitative? Will intuition be enough to build an effective study? Why aren't all students active in the class?

Such questions open up space for open-ended answers, and in these conversations there are sometimes original answers, atypical ways to solve research problems. Teaching the course "Research Methodology" involves mandatory independence in the work and the ability to accept and evaluate conflicting opinions and theories. The undergraduate must have a set of knowledge, analytical skills, different types of work – this is what allows you to independently search for the result.

A component of problem-based learning is a situation that can become problematic only if the undergraduates are motivated. The topic should be interesting, relevant, understandable for them, one that meets the professional needs of students.

The problem situation creates a conflict between old and new knowledge, research conditions and requirements for it, it requires the development of a new research strategy, will successfully deal with the problem situation. When working on choosing a set of problem situations on the topic, the teacher must anticipate the process of finding the right solution, identify and show contradictions and complex aspects of the topic, encourage students to the greatest independence in cognitive activity. The didactic principles (scientific, systematic, accessible, clear, etc.) are also necessary for the master's course, which should be the basis for identifying the problem situation.

The organization in the situation of distance learning problem lectures provides a special focus on relevance and clarity. First of all, the positions of the presented topic in science, its value, relevance for future professional activity should be determined, it is also necessary to know the directions and ways of its possible consideration and solution of research problems.

The interactive component of problem-based learning involves the mediating role of the teacher, who only guides the flow of thoughts and searches, students must form their own opinion and their own way to solve the problem.

In the structure of the problem lecture there is a set of top positions that must be developed. The research problem can be selected by students in advance, can be named at the beginning of the lecture, and can be an initial discussion of research tasks and areas of research. And in the end we can name the problem. The problem of completing the lecture involves continuing to find a solution after the lecture, in independent work.

The problem lecture determines the identification of the problem, the creation of cognitive difficulties, when in the course of research work, reasoning, students show possible ways to solve it. In quarantine conditions, the problem approach is a way to support active learning activities, promotes an interested attitude to professional growth and generally develops research skills and analytical thinking.

The teacher needs to submit educational material to stimulate analytical opportunities, which means to select such material, such problematic situations to arouse students' professional cognitive interest, an urgent need to solve the problem. In this regard, we should turn to the concept of information and cognitive contradiction, which within the course "Research Methodology" identifies different types of problem situations:

1. Understanding the lack of available knowledge and skills to solve the problem.
2. The need to use the acquired theoretical knowledge in practice.
3. Lack of available theoretical knowledge to evaluate the results of practical research.

In the context of online learning, the construction of these types of problem situations involves the use of electronic media, showing videos, presentations that contain a problem element. It is also important to use such communication systems that allow work in groups and pairs (breeding "offices"). Demonstration of research results and further analysis of the reasons and ways to obtain such results also requires prior training of both masters and teachers. Therefore, the problematic topics submitted for consideration presuppose ready-made illustrative material, preliminary information from which the undergraduate can begin his reflections.

Modern pedagogy has several aspects of the existence of a problem situation. This is a problem-based position, which is implemented according to the following algorithm: the level of existing knowledge and skills and those that are lacking in order to solve the problem; the methods and ways of activity necessary for the decision of a problem question are selected.

Another, no less important aspect, remains the motivational position, which should be constantly involved in the structure and content of the course. This is certainly a disciplinary component, but professional interest and self-interest remain key in online education. This is the only way to create a sufficiently intense cognitive need, then the problem lesson and its topic can interest undergraduates and encourage them to find solutions. The condition of such acceptance is also the presence in the presented problem situation of a component known to the student, ie part of the information that must be clear to the applicant. The problem situation in this context is transformed into a problem task. In the course of independent work on the problem there is an understanding that the available knowledge is not enough and it is necessary to increase their volume. Thus, the teacher's task is successfully implemented.

The problem task has its own sequence of actions, which under quarantine restrictions has undergone certain transformations. During the training course "Methodology of Scientific Research" a comprehensive algorithm for forming a problem was developed.

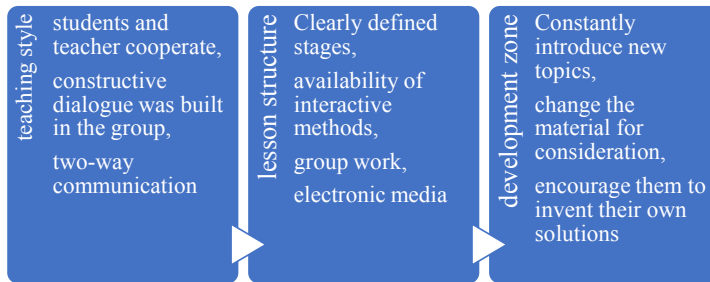


Fig. 2. Components of the formation of the problem approach in the tasks (author's development)

The chain of activities that will lead to the solution of the research task helps to gain new knowledge, skills with less effort and without loss of motivation.

In distance communication, special attention should be paid to changes in the style of communication between teachers and students, students among themselves. The gradual transition from an authoritarian form of teaching also involves a change in the rules of communication, where all participants in the learning process are active speakers (sometimes the teacher takes on only the role of moderator). That is, communication in the classroom is based on the principles of cooperation, mutual respect and cooperation.

The chosen topic should be clear and accessible to the student, ie in the structure of the lesson there is already familiar information that can be relied on to continue research. The principle of scientificity involves constant updating of educational material, as the situation may change, there are new aspects of the topic, new areas of research.

In addition, it is important to determine the level of independence in solving the problem. Sometimes it is a complex collective work, where a common decision is a common position, and everyone's participation is important. In the online format, this is a very important element of motivation to learn.

5. Conclusions

According to the results of the study, the use of problem-based learning during quarantine restrictions has a positive effect on the learning process. This helps to overcome the difficulties of online learning, such as reduced motivation, lack of active communication, lack of self-organization and skills in planning the learning process, as well as a number of psychological problems.

The introduction of problem-based learning in the course "Research Methodology" will better cope with the stressful situation of online learning, to form educational content so that the student remains motivated, not losing interest in research.

Problem-based learning creates the necessary conditions for the development of logical thinking, the development of analytical capabilities, a creative approach to solving research problems. The level of effectiveness of classes in online learning depends on the methodological skills of the teacher, the potential learning opportunities of the student, his motivation. Problem-based learning is used within the course "Research Methodology", as it encourages the activation of a creative approach to complex and problematic topics, activates thinking and teaches to independently analyze and solve problems at the professional level.

Higher education administrations should pay attention to the technical support of all participants in the educational process, as well as the introduction of ongoing consultations on digital education. Also, close cooperation of all participants in the educational process in the development and implementation of innovative technologies is designed to make the educational process more modern and competitive in the market of educational services.

In the future it is necessary to introduce research of theoretical developments and practical research to establish a set of methods for distance education, where an important component would be identified ways to overcome the psychological, educational, social consequences of the COVID-19 pandemic.

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