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NUTZUNG VON PROBLEMBILDUNGSTECHNOLOGIEN BEI DER ENTWICKLUNG DER KREATIVEN UND LOGISCHEN DENKFÄHIGKEITEN DER SCHÜLER

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Zusammenfassung: Der Artikel befasst sich mit Informationen darüber, wie die Trainingseffektivität im Bildungssystem mithilfe von problembasierten Lerntechnologien gesteigert werden kann. Im Unterricht können Studierende die kognitive Aktivität aktivieren; Verbinden Sie den Bildungsprozess mit Spiel, Arbeit und dem effektiven Einsatz problemorientierter Methoden durch den Lehrer (Pädagogen). Die breite Anwendung der Sprache und der Bildungsprozess werden durch interdisziplinäre Module organisiert, die auf die Bildung allgemeiner beruflicher Fähigkeiten abzielen.

Schlüsselwörter: Problempädagogik, Problembildung, Problemsituation, selbstständige Tätigkeit, schöpferische Tätigkeit.

USING OF PROBLEM EDUCATIONAL TECHNOLOGIES IN THE DEVELOPMENT OF STUDENTS' CREATIVE AND LOGICAL THINKING SKILLS

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Abstract: The article deals with information on how to increase training effectiveness in the education system using problem-based learning technologies. In teaching, students can activate the cognitive activity; combine the educational process with play, work, and the effective use of problem-based methods by the teacher (pedagogue). The wide application of language and the educational process is organized using interdisciplinary modules aimed at the formation of general professional skills.

Keywords: Problem education, problem levels of education, problem situation, independent activity, creative activity.

Introduction. The priorities of the systemic reform of secondary special education in the Republic of Uzbekistan have been identified, and a number of reforms are being carried out to develop social networks. Based on international experience, the gradual transition from a theoretical education system to an education system focused on the formation of practical skills is an actual issue. The transition to such an education system will undoubtedly develop students' skills of critical and creative thinking, independent processing and systematic analysis of information, and the discovery of new ideas.

In the educational process, lessons serve to assimilate and process information, create their imitations, as well as to develop information on the basis of new ideas, to increase students' competence in the use of Azeri knowledge in teaching and practice.

The wide-ranging reforms in the field of education in our country, in particular, government decisions on the development and improvement of ICT education, the connection of education with life, increasing the effectiveness of teaching, for a rapidly developing society requires the upbringing of a comprehensively developed harmoniously developed generation. In the traditional form of teaching, new pedagogical technologies have been widely used, which are the product of a specific form, method and means of education. But most of them are only part of the traditional learning process.

One of the important criteria for the effective application of techniques today is the ability to create a problematic situation, to put the problem on the agenda. According to educators, problem-based learning leads to the expansion of the student's independence, the scope of thinking. Problem-based learning encourages students to actively learn and directs their thinking to scientific research.

Problem-based learning is the operation of logical thinking (analysis, generalization) and the previously known methods of teaching and learning, taking into account the laws of students' research activities (problem situation, interest in learning, need). Therefore, problem-based learning provides more students with the development of thinking skills, the development of their general development and beliefs. Without excluding all the achievements of didactics, but using them, problem-based education remains a developmental tool for the development of scientific knowledge and concepts, worldview, the comprehensive development of the individual and his intellectual activity[1-4].

Problem-based teaching in didactics emerged as a new direction in the 70s and 80s of the twentieth century. A.M. Matoshkin, T.V.Kudryashev, M.I. Mahmutov, I.Ya.Lerner studied in depth the laws of problem-based learning.

Lerners said that it was "such an exercise in which students are regularly involved in solving problem-solving and problem-solving tasks based on the content of the program material". Two conclusions can be drawn from this definition:

1. Problem-based learning involves the complete or partial solution of potential problems independently for students;

2. To solve these problems, students need to create a situation that encourages them to solve problems.

Thus, **problem-based learning** is a problem situation under the guidance of a teacher, which organizes the educational process that allows students to creatively acquire knowledge, skills and abilities and develop intellectual activity as a result of active independent work. In addition, the essence of problem-based learning is the management of students' learning activities by the teacher to create a problematic situation in the learning process and to acquire new knowledge by solving learning tasks, problems and questions. This creates a research method of knowledge acquisition.

The success of problem-based learning depends on the following factors:

1. Problem-solving of educational material;
2. Activation of students' cognitive activity;
3. Combining the educational process with play, work;
4. To be able to effectively use problem-based methods by the teacher;
5. Create a chain of problem questions on solving a problem situation and explain it to students in a logical sequence.

Problem-based learning is a key way of forming students' scientific worldviews and understood as a specific personal subjective guide that guides a person's cognitive and practical activities.

The formation of a worldview is the formation of an individual's intellectual activity. There are two important conditions for the effective formation of a scientific worldview:

- Active intellectual thinking of students to master the system of concepts;
- Influence a person's feelings and emotions, turn his knowledge into belief.

Types of problem situations

The problem situation arises in a specific teaching environment, which is purposefully organized in certain pedagogical tools. It is also necessary to develop specific methods of creating such situations, based on the characteristics of the studied topics. Thus, a problem situation in teaching is not just a state of mental distress associated with an "unexpected obstacle in the way of thought".

A problem situation is different from any thinking difficulty in that the student understands the internal, hidden connections between the object (concept, fact) that requires the effort, the task that is important to him, and at the same time important.

The essence of the problem situation is that it is a contradiction between the information that the student is familiar with and the new facts, events (which lack previous knowledge to understand and explain them). This contradiction is the driving force for the creative assimilation of knowledge.

Symptoms of a problematic situation include:

- The presence of a fact unknown to the student;
- Instructions for the student to perform tasks, personal interest in solving the difficulties of learning.

Getting out of a problem situation is always associated with understanding the problem, that is, what is unknown, its verbal expression, and its solution.

If we analyze the problem situation mentally, it is primarily the independent mental activity of the students. It leads the student to understand the reasons for the intellectual difficulty, to access it, to express the problem in words, that is, to define active thinking. Consistency is evident here: first a problem situation arises, then a learning problem.

In teaching practice, there is another option - the one in which the problem seems to correspond to the appearance of a problem situation. The fact that the expression of the problem in the form of questions in the context of the contradictions of the theoretical rules of the judgments reflects the existence of a problematic situation, which is usually the answer to the question "why".

The problem consists of three components: known (based on a given task), unknown (finding them leads to the formation of new knowledge) and previous knowledge (student experience). They are necessary to carry out searches aimed at finding the unknown. First of all, the task of the learning problem, which is unknown to the student, is defined, and the methods and results of its implementation are unknown, so that students know the expected result or solution based on their previous knowledge and skills. falls in search.

Thus, a task that students know and how to solve it independently cannot be a learning problem, and secondly, it cannot be a learning problem even if they do not know how to solve a problem and the means to find it. an important stage of his activity is to invent or hypothesize a method of solving it and to substantiate the hypothesis.

The research period of individual cognitive activity can be expressed in special schemes: **problem situation - learning problem - research to solve the learning problem - problem solving.**

An important aspect of the organization and conduct of problem-based learning is that the teacher must have a good understanding of both its educational and pedagogical function. The teacher should never give students a ready-made truth (solution), but should motivate them to acquire knowledge and help them rework the information, events, time, and events they need in their lessons and life activities.

Problem situations can be used at all stages of the learning process: new topic statement, reinforcement, and knowledge control. In case of successful creation of a system of problem situations, it is recommended to pass this topic in the form of a problem lesson. In order to apply problem-based lessons to the teaching process, the teacher must address the following issues:

- What topics in the curriculum can be taught in the form of problem-based lessons;
- Identification of questions, tasks that raise a problematic situation on the issues in the text of the topic, while didactics adheres to the principles of scientific, systematic, logical, consistent, consistent;
- Identification of tools and methods that provide activation and management of students' learning activities, their proper and effective use.

The role of student independence in problem-based learning is more effective than in reproductive learning. The purpose of problem-based learning is to find answers to educational problems, problems and questions in the process of working with students, to acquire new knowledge by solving them, to create and solve problematic situations in the educational activities of students, and teachers can be interested in them.

A problematic situation is a dialectical contradiction between facts and information, information and knowledge, new evidence, events, situations that are given to the listener (learner), and the lack of previous knowledge to understand them. These contradictions (misunderstandings) serve as a driving force for the acquisition of creative knowledge.

The problem situation in the learning process is characterized by:

- The presence of unknown news for students;
- Solve problems themselves;
- Try to study the misunderstandings of personal interests and needs;
- Knowing what is unknown, understanding its meaning and trying to solve it.

There are several types of problem situations in the learning process:

1. Students do not know how to solve the problem, can not answer the problem.

2. Students are faced with the need to use their previous knowledge in a new environment.

3. There is a contradiction between the way a task can be solved theoretically and the difficulty of applying the chosen method in practice.

4. There is a contradiction between the practical achievement of the result in the performance of the task and the lack of knowledge in students to justify it theoretically.

Problem-based learning levels

Depending on the nature of the teacher-student relationship, problem-based education can be conditionally divided into 4 levels:

Table1

Levels of problem-based education

Levels of problem education	**Activities of teachers and students**
Level of non-independent (usual) activity	The student's understanding of what the teacher is explaining is mental work in problematic situations
Semi-independent activity level	Apply previous knowledge in new situations and involve students in finding solutions to learning problems posed by the teacher
Level of independent activity	Reproductive - research-type work in which the student works with the textbook, applies previous knowledge in a new situation, constructs, solves problems of moderate complexity, proves hypotheses with the help of the teacher, and others
Level of creative activity	Independent work that requires creative imagination, logical analysis and invention, the discovery of new ways to solve learning problems, independent proof: independent conclusions and generalizations, the discovery and writing of artistic essays

Problem-based learning should not be seen in the same way as the research method, but as a type of education that promotes the development of student thinking and memory, promotes creative acquisition of knowledge, accumulation of scientific facts and builds faith.

Requirements for the teacher in the process of problem-based learning.

In order for a teacher to apply problem-based learning technology to the teaching process, the teacher must address the following issues:

- Curriculum topics can be taught in the form of problem-based lessons;
- Identify questions, tasks that raise a problematic situation on the issues in the text of the topic, while adhering to the principles of scientific, systematic, logical sequence, consistency of didactics;
- It is necessary to identify the means and methods that provide activation and management of students' learning activities, to identify ways to use them in their place and effectively[1-4].

At present, effective methods of information coverage in the design of teaching materials, lecture texts for problem-based learning, including insert, B/B/B method, the use of visual aids, modeling games, work in small groups. lash, question and answer, and others

The proposed teaching technology is described in the example of the subject "ICT in professional activity" for students of tourism specialization of Bukhara College of Tourism and Cultural Heritage.

In order to ask and solve a problem on the topic of "Information Technology in Tourism", it is necessary to connect and recall new concepts with the previous knowledge of students. For example;

1. What is the difference between information technology and information systems?
2. What are the capabilities of electronic payment systems and their role in supporting entrepreneurs?

These questions can be summed up by dividing students into groups and listening to their answers.

From a methodological point of view, the main source of contradictions between concepts is the primary one. Contradictions need to be clarified at the end of the lesson[5-10].

The mechanism of conducting experimental work

The experiment was conducted at the Bukhara College of Tourism and Cultural Heritage. Parallel groups with similar levels of mastery were selected and divided into experimental and control groups. The criteria for evaluating the lesson in the control and experimental groups were the same and the following results were obtained (Table 2):

Table 2

Internship and academic year	Educational Institution	Number of students		Degree (mastering)	Experimental group	Control group
		Experimental group	Control group			
2021-2022 academic year	Bukhara College of Tourism and Cultural Heritage	36	35	The highest (excellent)	14 (39%)	9 (26%)
				High (good)	17 (47%)	16 (46%)
				Medium (satisfactory)	5 (14%)	10 (28%)

Students in the group were considered to meet the requirements of state educational standards. In order to determine the effectiveness of teaching the subject of "Tourism" on the basis of problem-based learning technologies, the final questions of students, the results of tests and summaries were analyzed in terms of quality and quantity.

Mathematical-statistical methods of pedagogical research methods of pedagogy were used in the analysis of experimental works.

The following table shows the dynamics of the level of knowledge of students (in terms of numbers and%) in the process of teaching based on problem-based learning technologies.

Indicators of the formation of skills and abilities of students in the field of "Tourism" using problem-based learning technologies

(Table 3)

Experience stage and academic year	Educational institution	Level of mastery	In the beginning of the experiment		In the end of the experiment	
			Experimental group	Control group	Experimental group	Control group
2021-2022 Academic year	Bukhara College of Tourism and Cultural Heritage	The highest (excellent)	8 (22%)	7 (20%)	14 (39%)	9 (26%)
		High (good)	12 (33%)	13(37%)	17 (47%)	16 (46%)
		Medium (satisfactory)	16 (45%)	15(43%)	5 (14%)	10 (28%)

Based on this information, we make the following designations:

Through x_i which we determine the grades that correspond to the experimental group;

Through y_i which we determine the values corresponding to the control group;

$\bar{x}$ and $\bar{y}$ quantities are used to determine the appropriate arithmetic mean for the experimental and control groups.

In this case the equations are valid.

$$\bar{x} = \frac{\Sigma x_i n_i}{n}, \quad \bar{y} = \frac{\Sigma y_i m_i}{m} \tag{1}$$

In the equations, the variables x_i and y_i take values of 3, 4, and 5, respectively.

The quantities *m*, *n* are the number of students relative to the corresponding grades.

It should be noted that the average value that assesses the effectiveness of the learning process is the ratio of the arithmetic mean values of the assessments of the experimental and control groups, that is, the coefficient of efficiency is obtained as follows.

$$\eta = \frac{\bar{x}}{\bar{y}}. \tag{2}$$

Mean squared deviations; $S_x^2 = \frac{1}{n}\sum_i n_i \cdot (x_i - \bar{x})^2$

$$S_y^2 = \frac{1}{m}\sum_i m_i \cdot (y_i - \bar{y})^2. \quad (3)$$

Standard deflection sizes;

$$S_x = \sqrt{S_x^2};\ S_y = \sqrt{S_y^2}. \quad (4)$$

Average value indicator;

$$C_x = \frac{S_x}{\sqrt{n}\cdot\bar{x}} \cdot 100\%; \quad C_y = \frac{S_y}{\sqrt{m}\cdot\bar{y}} \cdot 100\%. \quad (5)$$

Confidence intervals for unknown mean values of an empty set:

$$a_x \in \left[\bar{x} - \frac{t}{\sqrt{n}} \cdot S_x;\ \bar{x} + \frac{t}{\sqrt{n}} \cdot S_x\right];$$

$$a_y \in \left[\bar{y} - \frac{t}{\sqrt{m}} \cdot S_y;\ \bar{y} + \frac{t}{\sqrt{m}} \cdot S_y\right]. \quad (6)$$

Here is t- the standard deviation is determined based on the probability of R confidence. For example: if $R = 0{,}95$ than $t = 1{,}96$ equal.

We propose the hypothesis of equality of averages $H_0: a_x = a_y$ and test its contradiction $H_0: a_x \neq a_y$ on the basis of the student's criteria based on the above data.

$$T_{m,n} = \frac{|\bar{y} - \bar{x}|}{\sqrt{\frac{s_x^2}{n} + \frac{s_y^2}{m}}}. \quad (7)$$

If $T > T_r = t$, H_1 the hypothesis is rejected, and H_1 and the hypothesis is obtained.

Based on this information, the calculations for each stage and their comparative analysis are presented in the table below. During this research, the initial state of the students' experimental results and at the end of the experiment, the level of formation of students' knowledge, skills and abilities to work independently were determined through written and oral assessments in all subjects of Mathematics.

Comparative analysis of the experimental work:

$m = 36,\ n = 35$ number of students in the experiment and control group

a- in the beginning of the experiment

o- in the beginning of the experiment

$$\bar{x}_{a'} = \frac{1}{36}(38\cdot 5 + 12\cdot 4 + 16\cdot 3) = \frac{1}{36}(40 + 48 + 48) = \frac{136}{36} = 3{,}78$$

$$\bar{y}_{a'} = \frac{1}{35}(7\cdot 5 + 13\cdot 4 + 15\cdot 3) = \frac{1}{35}(35 + 42 + 45) = \frac{122}{35} = 3{,}21.$$

Efficiency coefficient:

$$\eta_{a'} = \frac{\bar{x}_{a'}}{\bar{y}_{a'}} = \frac{3{,}78}{3{,}21} = 1{,}18.$$

The following equations are obtained for standard deviations:

$$S_x^2 = \frac{1}{36} \cdot (8 \cdot (5 - 3{,}78)^2 + 12 \cdot (4 - 3{,}78)^2 + 16 \cdot (3 - 3{,}78)^2) =$$

$= \frac{1}{36} \cdot (8 \cdot 1{,}22^2 + 12 \cdot 0{,}22^2 + 16 \cdot 0{,}78^2) = \frac{1}{36} \cdot (11{,}9 + 0{,}58 + 9{,}7) = \frac{22{,}21}{36} =$
$0{,}62$

$S_x = \sqrt{S_x^2} = \sqrt{0{,}62} = 0{,}79;$

$S_y^2 = \frac{1}{35} \cdot (7 \cdot (5 - 3{,}21)^2 + 13 \cdot (4 - 3{,}21)^2 + 15 \cdot (3 - 3{,}21)^2) =$

$= \frac{1}{35} \cdot (7 \cdot 1{,}79^2 + 13 \cdot 0{,}79^2 + 15 \cdot 0{,}21^2) = \frac{1}{35} \cdot (22{,}43 + 8{,}11 + 0{,}7) =$

$\frac{31{,}24}{35} = 0{,}89$

$S_y = \sqrt{S_y^2} = \sqrt{0{,}89} = 0{,}94$

Average indicators:

$\tilde{N}_x = \frac{S_x}{\sqrt{36} \cdot 3{,}78} \cdot 100\% = \frac{0{,}79}{6 \cdot 3{,}78} \cdot 100\% = \frac{79\%}{22{,}68} = 3{,}48\%;$

$\tilde{N}_y = \frac{S_y}{\sqrt{35} \cdot 3{,}21} \cdot 100\% = \frac{0{,}94}{5{,}91 \cdot 3{,}21} \cdot 100\% = \frac{94\%}{19} = 4{,}95\%;$

$a_x \in \left[3{,}78 - \frac{1{,}96}{\sqrt{36}} \cdot 0{,}79;\ 3{,}78 + \frac{1{,}96}{\sqrt{36}} \cdot 0{,}79\right] = [3{,}52;\ 4{,}04];$

$a_y \in \left[3{,}21 - \frac{1{,}96}{\sqrt{35}} \cdot 0{,}94;\ 3{,}21 + \frac{1{,}96}{\sqrt{35}} \cdot 0{,}94\right] = [2{,}9;\ 3{,}52]$

We calculate the results of these calculations at the end of the experiment:

$\bar{x}_o = \frac{1}{36} \cdot (14 \cdot 5 + 17 \cdot 4 + 5 \cdot 3) = \frac{1}{36} \cdot (70 + 61 + 15) = \frac{146}{36} = 4{,}06;$

$\bar{y}_o = \frac{1}{35} \cdot (9 \cdot 5 + 16 \cdot 4 + 10 \cdot 3) = \frac{1}{35} \cdot (45 + 64 + 30) = \frac{139}{35} = 3{,}97.$

$\eta_i = \frac{\bar{x}_o}{\bar{y}_0} = \frac{4{,}06}{3{,}97} = 1{,}02$- relative growth

This means that the experimental group scored 1.02 times higher than the control group at the end of the experiment.

If we compare it to the beginning of the experiment, in this case the efficiency is:

In the experimental group:

$$\eta_{o'} = \frac{\bar{x}_0}{\bar{x}_{a'}} = \frac{4{,}06}{3{,}78} = 1{,}07$$

In the control group:

$$\eta_i = \frac{\bar{y}_0}{\bar{y}_{a'}} = \frac{3{,}97}{3{,}21} = 1{,}24$$

The following equations apply to standard deviations:

$S_x^2 = \frac{1}{36} \cdot (14 \cdot (5 - 4{,}06)^2 + 17 \cdot (4 - 4{,}06)^2 + 5 \cdot (3 - 4{,}06)^2) =$

$= \frac{1}{36} \cdot (14 \cdot 0{,}94^2 + 17 \cdot 0{,}06^2 + 5 \cdot 1{,}06^2) = \frac{1}{36} \cdot (12{,}37 + 0{,}061 + 5{,}62) =$

$\frac{18{,}05}{36} = 0{,}5$

$S_x = \sqrt{S_x^2} = \sqrt{0{,}5} = 0{,}707;$

$$S_y^2 = \frac{1}{35} \cdot (9 \cdot (5-3{,}97)^2 + 16 \cdot (4-3{,}97)^2 + 10 \cdot (3-3{,}97)^2) =$$

$$= \frac{1}{35} \cdot (9 \cdot 1{,}03^2 + 16 \cdot 0{,}03^2 + 10 \cdot 0{,}97^2) = \frac{1}{35} \cdot (9{,}55 + 0{,}014 + 9{,}4) =$$

$$\frac{18{,}964}{35} = 0{,}54$$

$$S_y = \sqrt{S_y^2} = \sqrt{0{,}54} = 0{,}73.$$

Averages:

$$\tilde{N}_x = \frac{S_x}{\sqrt{36} \cdot 4{,}06} \cdot 100\% = \frac{0{,}707}{6 \cdot 4{,}06} \cdot 100\% = \frac{70{,}7\%}{24{,}36} = 2{,}91\%;$$

$$\tilde{N}_y = \frac{S_y}{\sqrt{35} \cdot 3{,}97} \cdot 100\% = \frac{0{,}73}{5{,}91 \cdot 3{,}97} \cdot 100\% = \frac{73\%}{23{,}46} = 3{,}11\%;$$

$$a_x \in \left[4{,}06 - \frac{1{,}96}{\sqrt{36}} \cdot 0{,}707;\ 4{,}06 + \frac{1{,}96}{\sqrt{36}} \cdot 0{,}707\right] = [3{,}83;\ 4{,}29];$$

$$a_y \in \left[3{,}97 - \frac{1{,}96}{\sqrt{35}} \cdot 0{,}73;\ 3{,}97 + \frac{1{,}96}{\sqrt{35}} \cdot 0{,}73\right] = [3{,}73;\ 4{,}21]$$

The results of each stage were analyzed mathematically and statistically, and these results were checked by the Student Criteria and conclusions were drawn.

$$T = \frac{|\bar{x}_a - \bar{x}_o|}{\sqrt{\frac{s_{\bar{x}_a}^2}{n} + \frac{s_{\bar{x}_o}^2}{m}}}.$$

In the experimental group: $\bar{x}_{a'} = 3{,}78$ va $\bar{x}_o = 4{,}06$

$\eta_{o'} = 1{,}07$ efficiency coefficcient. $T_{o'} = \frac{|3{,}78-4{,}06|}{\sqrt{\frac{22{,}32+17{,}5}{1260}}} = \frac{0{,}26}{\sqrt{0{,}032}} = \frac{0{,}26}{0{,}18} = 1{,}44.$

$T_m = 1{,}44 < T_{0{,}96}(t) = 1{,}96$

Thus, H_0 the assumption was accepted.

In the control group: $\bar{y}_{a'} = 3{,}21$ va $\bar{y}_o = 3{,}97$

$\eta_i = 1{,}24$ efficiency coefficient.

$$T_i = \frac{|3{,}21-3{,}97|}{\sqrt{\frac{32{,}04+18{,}9}{1260}}} = \frac{0{,}78}{\sqrt{0{,}04}} = \frac{0{,}78}{0{,}2} = 3{,}9.$$

$T_i = 3{,}9 \succ T_{0{,}96}(t) = 1{,}96$

Thus, H_0 the assumption was not accepted.

Indicators of the effectiveness of students' knowledge The following table shows the level of formation of students' skills in the field of tourism using pedagogical technologies in the teaching process (Table 4).

Table 4

№	Indicators	Higher institution	In the experimental group		In the control group	
			In the beginning of the experiment	In the end of the experiment	In the beginning of the experiment	In the end of the experiment

1	The average arithmetic sum ($\bar{x}, \bar{y}$)	Bukhara College of Tourism and Cultural Heritage	3,78	4,06	3,21	3,97
2	Efficiency Index (η)	Bukhara College of Tourism and Cultural Heritage	1,07		1,24	
3	Average value confidence interval ($a_x \in, a_y \in$)	Bukhara College of Tourism and Cultural Heritage	[3,52;4,04]	[3,89;4,29]	[2,9;3,52]	[3,73;4,21]
4	The average value is the standard error (S_x, S_y)	Bukhara College of Tourism and Cultural Heritage	0,79	0,707	0,94	0,73
5	Identification index (S_x, S_y)	Bukhara College of Tourism and Cultural Heritage	3,48%	2,91%	4,95%	3,11%
6	Student (S) criteria	Bukhara College of Tourism and Cultural Heritage	1,53		3,9	
7	Indication	Bukhara	H_0 assumption was		H_0 assumption was not	

	results	College of Tourism and Cultural Heritage	expected	expected

Therefore, based on the results in the table, it was found that the method used in the experimental group was more effective than in the control group.

The results of the experiments show that the indicators of the formation of skills and abilities of students in the field of tourism using problem-based learning technologies in the teaching process were 1.07 times more effective in the experimental group and 1.24 times more effective in the control group.

Conclusion: Thus, I consider it necessary to use the problem-based learning method in teaching students because;

- Develops the ability to self-study;
- Contributes to the formation of a certain worldview of students;
- High independence of knowledge acquisition determines the possibility of converting them into beliefs;
- Forms the student's personal motivation, his or her educational interests;
- Develops students' thinking skills;
- Helps to form and develop students' dialectical thinking, provides identification of new connections in the studied phenomena and laws.

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