LARYSA BACHIIEVA
Associate Professor of the Department of Pedagogy, Methods and Management of Education, the Ukrainian Engineering and Pedagogical Academy, Candidate of Pedagogical Sciences; *e-mail: bachievalarisa@gmail.com*

TECHNOLOGY OF CREATING A SYSTEM OF MULTILEVEL TASKS AS A MEANS OF MONITORING STUDENT LEARNING ACHIEVEMENTS

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ABSTRACT

The paper presents the technology of creating a system of multilevel tasks in order to monitor the achievement of learning outcomes. It involves the consistent implementation of such stages: identification of sources of educational and scientific information, their study and selection; creation of didactic materials (logical and semantic structure and the plan of the topic presentation); determining the level of achievement for each concept of the topic; development of tasks using the kit. The implementation of the presented technology allows for the achievement of the following results: the formation of the actual content of education, the determination of the required level of learning of information; implementation of informational, formative and corrective monitoring functions by means of a system of multilevel tasks.

KEYWORDS

multilevel tasks, logical-semantic structure, levels of learning of educational information

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INTRODUCTION

Among the priority strategic areas declared in the National Strategy for Education Development for 2012–2021 the creation of a national system for monitoring the quality of education is defined. The statement of such a problem is connected with the movement of the Ukrainian education system into the European educational space, which requires its constant improvement, the search for effective ways to improve the quality of educational services. Quality education is a necessary condition for ensuring the sustainable development of society, the consolidation of all its institutions, the humanization of socio-economic relations, the formation of new life goals of the individual.

One of the factors ensuring the quality of education is the introduction of a student-centered approach [12]. The analysis of its provisions made it possible to single out those related to student-centered assessment, namely: respect and consideration of the diversity of students and their needs; introduction to available methods of assessment and support for the development of skills in this area; introductory announcement of criteria and methods; provision of an opportunity to demonstrate the extent to which the planned learning outcomes have been achieved. Understandably, that it is easy enough for a teacher to familiarize the students with the content, methods, forms and evaluation criteria. The more difficult task is to take into account the diversity of students and provide each of them with opportunity to demonstrate the extent to which the educational goal has been achieved.

Thus, the growing public interest in the educational issues shifts the "quality of education" concept from the study and analysis of a limited number of experts in the field of public policy, making it the subject of extensive public, professional and scientific discussions. It is understandable that the reform of the educational system is impossible without the creation of means of independent objective evaluation of the quality of education to establish the degree of conformity of real educational results with the government requirements, social and personal expectations of young students. One of the ways to address the issue of improving the quality of education is the use of modern technologies for monitoring education, among which we define the following: monitoring the quality of education, monitoring educational activities, monitoring the educational achievements of students. In our view, such activities should be implemented with the help of means that, firstly, take into account the diversity of students (in particular, the level of learning of educational information that the student seeks to achieve in a specific topic or discipline); secondly - provision the student with the opportunity to practically demonstrate the level of knowledge, skills, competence, etc. One of the means that is capable of meeting the above conditions is a system of multilevel tasks. Thus, the system of monitoring the quality of education at the level of a specific topic or academic discipline requires the creation of a system of multilevel tasks that will ensure the implementation of monitoring functions at the relevant levels.

The purpose of the study is to develop and test the technology of creating a system of multilevel tasks as a means of monitoring the educational achievements of students. The object of the study is the process of monitoring educational achievements in the discipline "Fundamentals of Scientific Research" of professional training of scientific and pedagogical specialists in institutions of higher education. The subject of the study is a system of multilevel tasks as a means of monitoring the educational achievements of students on the topic "Methodological principles and conceptual apparatus of pedagogical research" in the discipline "Fundamentals of Scientific Research".

The methods of theoretical and empirical research have been used in order to achieve the goals of the research. Among the theoretical methods the following have been used: analysis of sources of scientific information on the essence of monitoring, analysis of the quality of educational literature, development of didactic materials, levels of learning of information. A pedagogical experiment on the implementation of the developed system of multilevel tasks as a means of monitoring the educational achievements of students has been used.

V. Grigorash, G. Yelnikova, O. Zahika, R. Zelensky, O. Kovalenko, K. Kolos, M. Rostoka, Z. Ryabova and others provide theoretical principles for the implementation of monitoring in their works. The issue of development of didactic materials is in the focus of scientists N. Bryukhanova, O. Kovalenko, N. Korolyova and others. B. Bloom's taxonomy and V. Bespalko's theory involve the main concepts regarding the levels of learning information. Theoretical provisions for the kits of multilevel tasks are presented in the works of O. Pometun, L. Ilyushin and other scientists. Methods of teaching research activities are presented in the works of A. Asherov, Volkov, V. Kovalchuk, T. Koksharova, I. Krynetsky, V. Krutov, V. Mygal, N. Mitsenko, L. Moiseeva, R. Nikiforov, M. Pavlyshenko, O. Pushkar, M. Sverdan, V. Sydorenko, O. Suvorin, O. Terekhina, A. Filipenko, G. Sheveleva and other scientists.

Development of technology for creating a system of multilevel tasks as a means of monitoring the educational achievements of students

Consideration of the development of technology for creating a system of multilevel tasks as a means of monitoring academic achievements is to be started with a review of the essence of the "monitoring" concept. Thus, "...monitoring in education (from the Latin monitor – someone, who reminds, supervises, keeps) is a special system of collecting, processing, storing and disseminating information about the state of education, forecasting based on objective data of the dynamics and main trends of its development, as well as development of scientifically sound recommendations for management decisions to improve the efficiency of the educational sector" [3, p.9]. At the same time, monitoring the quality of education can be internal and external. Internal monitoring of the quality of education is carried out by educational institutions (other educational entities). External monitoring of the quality of education can be carried out by any bodies, enterprises, institutions, organizations, other legal entities that carry out an independent evaluation of the quality of education and educational activities. The participation of educational institutions (other educational entities) and those involved in the educational process in the external monitoring of the quality of education is voluntary, except in cases established by law.

Monitoring in education performs certain functions, namely: informational (provides an opportunity to evaluate the efficiency of the pedagogical process, to obtain information about the state of the object, to provide feedback); research (involves participation in the monitoring of various educational actors); formative and correctional (introduction of monitoring in education promotes more effective implementation of the process of formation and adjustment of personality characteristics); system (requirements of scientificity of any monitoring provides, first of all, its organization and carrying out on the basis of the system approach) [3, p. 27].

Due to its functions, monitoring is a complex system that aims to monitor the state of development of the pedagogical process with a view to optimal selecting the goals and objectives, as well as the means and methods of achieving them. Therefore, monitoring requires powerful tools (factor-criterion models, multilevel tasks, etc.). Our focus is on the technology of creating a system of multilevel tasks for the implementation of monitoring the educational achievements of students. To illustrate the steps of technology implementation, we present its practical implementation on the example of the topic "Methodological principles and conceptual apparatus of pedagogical research" of the academic discipline "Fundamentals of Scientific Research".

The first stage of the technology for the development of multilevel tasks for the implementation of monitoring of educational achievements of students in the discipline is aimed at reviewing competencies, the formation or improvement of which is provided by the discipline. Further work should be focused on the analysis of program results (PR) and components of learning outcomes. The work done allows for determining the strategic goal of studying the discipline and outlining the purpose of training on a specific topic of the discipline. Within our study, we do not give an example of such an analysis, because it is not our main task.

The second stage of the technology involves the search for sources of scientific information, their study and selection of better ones. To implement this task, we have used the method proposed by researchers O. Kovalenko, N. Bryukhanova and

N. Korolyova [4]. Our focus is, in accordance with the topic "Methodological principles and conceptual apparatus of pedagogical research" of the academic discipline "Fundamentals of scientific research", on studying of the materials on the basics of scientific research, namely: Honcharenko S. Pedagogical research: Methodological advice to young scientists [2]; Sysoeva S., Krystopchuk T. Methodology of scientific and pedagogical research [9]; Romanchykov V.I. Fundamentals of scientific research [7]; Sheiko V.M., Kushnarenko N.M. Organization and methods of research [11]. Review of the above sources of scientific information according to the method [4], allowed us to identify the educational aid "Pedagogical research: Methodological advice to young scientists" [2] as optimal for studying the topic "Methodological principles and conceptual apparatus of pedagogical research". Without quoting the source [4], we note that among the main indicators that contributed to the selection are the following: availability and systematic presentation of information; optimal volume; scientificity and connection with practice; logic and consistency of training material.

The third stage of the technology is aimed at creating didactic materials on the topic, namely: the logical-semantic structure and plan of teaching the topic. Note that the logical-semantic structure is a hierarchy of content elements of the topic in their logical relationship [4]. To develop it, the content elements of the topic are identified and their volume is revealed with the help of the division operation. In this case, the basic rules should be followed: the division should be appropriate (the sum of the volumes of the terms of the division should be equal to the volume of the concept to be divided); within one division it is necessary to apply only one basis; terms of the division must be mutually exclusive; the division must be continuous (when dividing the concept, it is necessary to move to the nearest lower form). The logical-semantic structure of the topic "Methodological principles and conceptual apparatus of pedagogical research" is shown in Fig. 1.

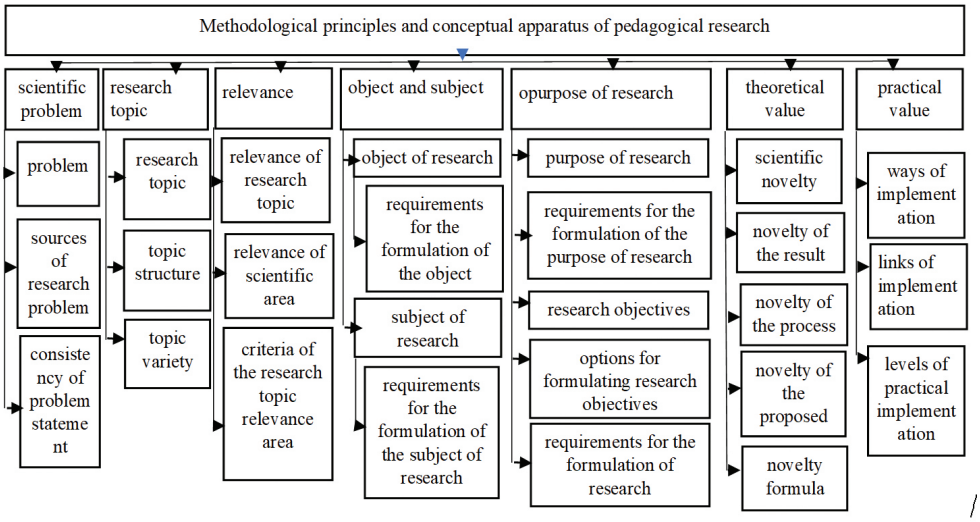

Figure 1. Logical and semantic structure of the topic "Methodological principles and conceptual apparatus of pedagogical research"

Thus, we have identified the content elements of the topic (concepts, events, objects, facts, etc.), determined the types of linkages between the substantive elements, provided a graphical presentation of the information. In the further work we will develop the plan

of the topic presentation. It includes a set of short names of logically completed parts of the educational topic, the sequence of which takes into account both the features of the content and students' level of knowledge (basic and the one to be formed) [4]. The plan for presenting the topic "Methodological principles and conceptual apparatus of pedagogical research": 1) research problem; 2) research topic; 3) relevance of research; 4) object and subject of the research; 5) purpose and objectives of research; 6) scientific novelty and theoretical value of research results; 7) practical value of the results of pedagogical research and their implementation. Thus, we have developed a logical-semantic structure and the plan for presenting the topic "Methodological principles and conceptual apparatus of pedagogical research", which demonstrate the content of educational information on the topic and consistency in its study.

The purpose of the fourth stage of the technology is to identify the level of thinking at which each of the identified content elements should be formed. Currently, two systems of setting different levels of goals are actively used in educational practice, namely: on the basis of levels of learning of educational information according to V. Bespalko [1] and on the basis of the hierarchy of mental processes according to B. Bloom [6]. In our work we use the method of goal setting according to B. Bloom as one that reveals the mental processes which are the basis of research. According to B. Bloom, the goals of learning directly depend on the hierarchy of mental processes, such as remembering, understanding, application, analysis, synthesis and evaluation. A set of tasks can be offered to each of these levels with the help of certain verbs. If we follow the taxonomy developed by B. Bloom, then the knowledge of students is only the first, simplest level of classification. There are five more levels of learning goals (or outcomes), the first three of which - knowing, understanding, and application - are lower-order goals (low-level thinking). And the next three - analysis, synthesis, evaluation – are higher-order goals (high-level thinking). The presented taxonomy of educational goals and results allows for developing a hierarchy of educational goals of the discipline or a particular topic. The fragment of identifying the level of thinking, at which content concepts of the topic "Methodological principles and conceptual apparatus of pedagogical research" will be formed, is given in table 1.

Table 1 - Identifying the level of thinking at which each content concept of the topic "Methodological principles and conceptual apparatus of pedagogical research" is to be formed (fragment)

Item No.	Topic concept	Levels of thinking					
		Familiarizing	Understanding	Application	Analysis	Synthesis	Evaluation
1	scientific problem	+	+	+	+	+	+
2	sources of the problem	+	+	+	+		
3	consistency of problem statement	+	+	+	+	+	+
4	objective contradiction	+	+	+	+	+	+
5	research problem for yourself	+	+	+	+		
6	research problem for all	+	+	+	+		
7	structure of research problem	+	+	+	+	+	+
n	.....	...	...	...	...	...	...

Monitoring of the achievement of the stated goals (Table 1) should be carried out using special tools - questions and tasks. In this respect, it is understandable that there is a direct connection between the levels of thinking and the answers to the questions asked by the teacher. In addition, the questions themselves form a hierarchy which is quite consistent with the taxonomy of thinking. Questions for remembering are at the lowest level. Questions for evaluation or judgment are considered as a high level of thinking. However, all questions are important and they all lead to different types of thinking. Therefore, the way to monitor the formed learning outcomes is to use tasks that are aimed at monitoring a specific learning goal. The use of B. Bloom's taxonomy contributes to the formulation of cognitive tasks that ensure the achievement of learning outcomes at different levels, i.e., multilevel ones. Such tasks can be developed with the help of special verbs that "program" the student mental activity of a certain level. Consider the system of interrogative words with which questions are formulated for this level, and verbs, using which the student activities at different levels of thinking can be built (Table 2).

Table 2. - Question words and verbs for different levels of learning outcomes, by O. Pometun [6]

Level of thinking / learning outcome	Verbs with which the student activities at different levels of thinking can be built
Acquisition of knowledge (information)	Define, repeat, make a list, find, show, retell, specify, remember, name, reproduce, record, tell
Understanding of information	Explain, describe, recognize, arrange, select, translate, retell in your own words, underline
Application, use	Apply, use, explain, estimate, choose, complete, examine, conduct experiment, illustrate, calculate
Analysis	Identify the parts of the characteristic, causes, consequences, determine a sequence, divide, break, analyze, structure, compare, match
Synthesis	Group, compile, put together, compose, create, develop, formulate, summarize, combine, invent, change, organize, plan, prepare, suggest, regroup, rewrite, set, replace
Evaluation	Evaluate, compare what is best, who is right, why it is important, prove, convince, justify, recommend, support, review, assess

The questions (tasks) formulated on the basis of the application of the given kit of tasks concerning each content element of the topic (discipline) constitute a system of multilevel tasks.

The next, fifth stage, involves building a system of multi-level tasks for each defined content element of the topic (Fig. 1), according to the defined levels of thinking (Table 1) and the kit of tasks (Table 2). Tasks (questions) on the content concept of the "research topic" are given in Table 3.

Table 3 - Example of tasks (questions) on the content concept of the "research topic"

Level	Tasks (questions)
1	2
Knowing	Questions: 1. What is the topic of scientific pedagogical research? 2. Give examples of topics of scientific pedagogical research. 3. When does a researcher formulate a research topic? Task. Using the sources of scientific information, find several research topics that are aimed at addressing the issues of professional training of teachers in vocational education.
Understanding	Question: 1. What does the topic of scientific research substantially reflect? 2. Whether the research problem is reflected in the topic? 3. Is it necessary to substantiate the research topic? Task. From the given characteristics underline those reflecting requirements to a research topic. Verbose; short; completed wording; characterizes the phenomena; which do not constitute the problem.
Application	Question: 1. Is it possible to develop topics that arise as a result of the development of the issue on which the research team is working? 2 In what other situations can „customized" research topics be implemented? 3. What can prevent a scientist from deciding on a relevant research topic? Task. From the given topics of scientific researches choose more relevant ones, according to your considerations, concerning areas of educational development. Justify the answer. A) Pedagogical conditions for intensification of educational activities of future computer-related engineers-teachers in professional training. B) Theoretical and methodological principles of the adaptive system of professional masters' training in management of educational institutions. C) Theoretical and methodical principles of formation of innovative culture of future engineers -teachers in the process of professional training.
Analysis	estion: 1. Analyze the following criteria for choosing the topic: relevance, novelty and prospects; the possibility of implementing the topic in this scientific institution, its connection with the plans for the development of the education system. 2. What is the relationship between the research problem and the research topic? 3. What does the formulation of the research topic include? Task. Identify in the given formulation of the topic: the phenomenon, process, system under research; the essence of the problem; the environment in which the researcher's activities are planned; the object from which this research was conducted.
Synthesis	Questions: 1. What does the existence of such elements as relevance, novelty and perspective in the formulated topic indicate; the possibility of implementing the topic in this scientific institution, its connection with the plans for the development of the education system? 2. What should the researcher do before the final formulation the research topic? 3. Why do you think that „almost any relevant topic can ensure the implementation of scientific research, it all depends on the depth of its studying"? Task. Suggest topics of research based on the issues of professional training of future teachers of vocational education.
Evaluation	Question: 1. Is it right or wrong that when formulating a research topic, it is necessary to delve into the problem in order to reflect it in the topic of the work? 2. Do you agree that two persons who are not connected to each other cannot address a problem in the same way? Why? 3. Do you agree that incorrect formulation of the topic leads to arbitrary interpretation of the problem and often to spontaneous collection of facts. Why? Task. Compare the proposed research topics. Determine the existence of such characteristics, namely: the phenomenon, process, system under research; the essence of the problem; the environment in which the researcher's activities are planned; the object from which this research was conducted

The tasks (questions) thus developed for each contensive concept create a system of multilevel tasks on the topic or discipline.

The procedure of the experiment and its discussion.

The study was conducted on the basis of the Ukrainian Engineering and Pedagogical Academy, Kharkiv, Kharkiv region, Ukraine. The respondents are 68 master's degree students in the specialty 011 Educational pedagogical sciences. The representativeness of the sample is due to the fact that the total number of master's degree students in this specialty is 104 students, i.e., the sample is 65% of the total amount. The number of experts was calculated and amounted to 7 teachers [10]. The experimental technology was introduced into the discipline "Methodology and organization of scientific research".

Validity and reliability of the research was ensured by the fact that the evaluation of the competence to be formed by the discipline was tested by several methods, namely monitoring and pedagogical experiment. The implementation of these methods has provided similar results.

Monitoring was carried out in accordance with the stages: the first - preparatory (goal setting; defining experimental and control groups; determining the timing (the discipline studying period); development of tools for monitoring (system of multilevel tasks); the second – practical part of monitoring (data collection; observation; testing); the third - analytical (systematization of the results; analysis of available data). Thus, the content of the academic discipline "Methodology and organization of scientific research" includes 11 topics. A system of multilevel tasks was developed for each topic. Before studying each topic, students familiarized themselves with the content of the tasks, and they independently chose their level. Upon completion of the study of the topic, the second stage of monitoring was implemented - students completed the tasks and also had an opportunity to select their level. The third stage of monitoring was implemented after the completion of the study of the discipline before the exam. The results of selecting the levels of mastering the tasks at the monitoring stages are shown in Table 4.

Table 4. - The results of the selection of multilevel tasks at the monitoring stages

No.	The level of learning of educational information	Monitoring implementation stages					
		First stage		Second stage		Third stage	
		number	%	number	%	number	%
1	Knowing	33	49	10	15	2	3
2	Understanding	17	25	15	22	5	7
3	Application	15	22	17	25	12	18
4	Analysis	2	3	9	13	19	28
5	Synthesis	1	1	8	12	17	25
6	Evaluation	0	0	9	13	17	25

Thus, at the first stage of monitoring the vast majority of students chose to perform the tasks of the first and second levels, at the second stage the number of students who chose higher levels increased significantly (47% of respondents), the results of the third stage of monitoring have shown that students have adequately mastered educational material and are able to perform activities at the level of analysis, synthesis and evaluation (78% of respondents). Note that the assessment of the completion of questions (tasks) was determined taking into account the level of its complexity.

At this stage of the study, we also proceed from the hypothesis that the monitoring should help students to adjust their independent work, to promote the discipline of educational activities. This should be done because they see the results of their work, navigate the formed level of acquired knowledge and skills (competence), work out "gaps" in the material.

In accordance with the requirements of the pedagogical experiment, reliability, probability and validity have been determined as the main indicators of the results of experimental work. The reliability of the results of experimental work has been achieved through the implementation of the procedures in accordance with standardized methods. The probability of the results of the experimental work has been ensured by the identical conditions of the educational process of the experimental and control groups. The validity of the results has been ensured by the fact that the main factors of influence (contingent of students, their level of competence, conditions of organization and conduct of pedagogical experiment) in the control and experimental groups were the same, except for one - developed experimental methodology for monitoring students' learning achievements with the help of multilevel tasks.

The efficiency of the developed methodology is ensured by increasing the levels of competence (knowledge, skills, qualities) of students. That is why the criteria of the developed methodology efficiency are the following: criterion of knowledge and skills formed K_1; criterion of influence of the methodology elements on professionally important qualities K_2. Let's take a closer look at each of the criteria and set a list of indicators included in it. The main indicators that characterize K_1 criterion are the indicator of knowledge formed - P_z, and an indicator of the skills formed - P_y.

When calculating the level of knowledge formed Pz. We proceeded from the perspective that it characterizes the actual number of solved theoretical tasks compared with the total number of tasks [9], and determined by formula (1):

$$P_z = \frac{Zf.}{Zn.}, \quad (1)$$

where Z_f. – the actual number of theoretical tasks solved by the student; Z_n. – the total number of tasks. To convert certain quantitative values of the indicator according to the levels: low, medium, high – we use the scale [9] and get: low level (P_z. <0,7); medium level ($0.7 \le P_z$. <0.85); high level ($0.85 \le P_z$. ≤ 1).

Let's define the formula to determine the following indicator of skills formed - P_y. Quantitative value of the P_y. indicator is set as the ratio of the number of correctly performed actions when fulfilling a learning task to the total number of actions required to fulfill the task [9] (2).

$$P_{y.} = \frac{a.}{b.} \quad (2)$$

where a is the number of correctly performed actions when fulfilling the task; b is the total number of actions required to solve the task. To convert certain quantitative values - of the indicator according to the levels: low, medium, high – we use the scale [9] and get: low level (P_y <0.7); average level (0.7 ≤ P_y. <0.85); high level (0.85 ≤ P_y. ≤ 1).

The indicator of students' independence is characterized by the number of the student's referrings to tips at the first and control stage of the learning task. To calculate it, the following formula [9] (3) is used:

$$P_{s.} = 1 - \frac{p.}{m.} \quad (3)$$

where p is the number of the student's referrings to tips at the first fulfillment of the learning task; m - the number of the student's referrings to tips at the control stage of the learning task. To convert certain quantitative values of the indicator according to the levels: low, medium, high, we use the scale [9] and get: low level (P_s. <0.4); average level (0.4 ≤ P_s. <0.7); high level (0.7 ≤ P_s. ≤ 1). The results of the experimental study are presented in table 5.

Table 5. - The results of the pedagogical experiment

No.	Criteria and indicators	Experiment results	
		EG	CG
Criterion of formation of research knowledge and skills			
1	Knowledge formation indicator	0,87	0,75
2	Skills formation indicator	0,85	0,78
Criterion of influence of the methodology elements on formation of professionally important qualities			
1	The degree of influence on the formation of independence of students	0,9	0,69

The results obtained indicate an improvement in the quality of education. The knowledge formation indicator in the experimental group is 0.87 (high level); 0.75 in the control group (medium level); the skills formation indicator is determined at a high level - 0.85; at the medium in the control group - 0.78. Positive results were obtained in experimental groups in determining the criteria of the influence of the methodology elements on the formation of students' independence, namely: experimental group 0.9 (high level) control group - 0.69 (medium level). In addition, in the experimental group, the average score of knowledge assessment is 24.7 points (20.5 points in the control group), the average score of skills assessment in the experimental group is 23.8 points (19.2 in the control group). In this case, the maximum score in the discipline on the exam can be 27 points. Positive results were obtained in the experimental groups in determining the criteria of the influence of the methodology elements on the formation of students' independence, namely: experimental group 0.9 (high level) control group - 0.69 (medium level). Statistical processing of the obtained data was performed on the basis of non-parametric Pearson criterion. The significance of statistic conclusions was taken for a confidence level of p≤ 0.05. The calculations were performed using the EXCEL program. The calculations confirmed the statistical significance of the indicators.

The next stage of the experimental study was to determine the objectivity of the

results, i.e., that the monitoring contributed to taking into account the level of learning of educational information sought to be achieved by the student on a particular topic (discipline) and enabled him or her to demonstrate the level of knowledge, skills, competence in the topic (academic discipline). The survey was conducted among students of experimental groups. Based on the results of the experimental study, we obtained the data shown in table 6.

Table 6 - Analysis of the student survey results

No.	Questions	Answer options	Number of respondents	%
1	Did the monitoring on the basis of multilevel tasks helped to determine the level of learning of educational information on the topic (academic discipline) you want to achieve?	So	35	51
		Rather yes than no	23	34
		Rather no than yes	8	12
		No	2	3
2	Did the monitoring, on the basis of multilevel tasks, ensure the determination of the dynamics of the formation of competence, the formation or development of which is provided by the topic (academic discipline)?	So	31	46
		Rather yes than no	23	34
		Rather no than yes	10	15
		No	4	6
3	Did the monitoring on the basis of multilevel tasks make it possible to practically demonstrate the level of formation of your competence on the topic (academic discipline)?	So	37	54
		Rather yes than no	20	29
		Rather no than yes	9	13
		No	2	3
4	Are multilevel tasks an effective means of monitoring academic achievement?	So	20	29
		Rather yes than no	24	35
		Rather no than yes	22	32
		No	2	3

The analysis of the obtained results defines that 85% of students note that monitoring allows them to determine the level of learning of educational information on the topic (academic discipline) they sought to achieve; 80% indicate that monitoring has provided the determination of the dynamics of competence formation on the topic (academic discipline); 83% of students emphasize that the monitoring has allowed them to practically demonstrate the level of competence formation on the topic (academic discipline); 64% of respondents in the experimental groups recognized multilevel tasks as an effective means of monitoring academic achievements. Thus, the monitoring made it possible to take into account the students' demands and provide an opportunity to practically demonstrate the level of competence that leads them to further training. The results of the pedagogical experiment led to the conclusion about the positive impact of monitoring by means of multilevel tasks on the results of the students' competence formation.

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CONCLUSIONS

1. Monitoring of educational achievements of students is carried out in order to determine the consistency of the actual results of educational activity with its stated goals, as well as to assess the extent, direction and causes of deviations from the goals.

2. One of the powerful means of monitoring the educational achievements of students is a system of multilevel tasks.

3. The technology of creating a system of multilevel tasks as a means of monitoring the educational achievements of students involves the implementation of the following stages: analysis of competencies, the formation or improvement of which is provided by the academic discipline; search for sources of scientific information, their study and selection of quality ones; development of didactic materials on the topic (logical-semantic structure and plan); determining the level of thinking at which each of the identified content elements should be formed; building a system of multilevel tasks for each defined content element on the basis of the kit.

4. It has been determined that the implementation of monitoring allows for taking into account the diversity of students (in particular, the level of learning of educational information, sought to be achieved by the applicant in a particular topic or academic discipline); secondly - to provide the student with an opportunity to practically demonstrate the level of formed knowledge, skills, competence.

5. The results of the pedagogical experiment led to the conclusion about the positive impact of monitoring by means of multilevel tasks on the results of the student' competence formation.

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TECHNOLOGIA KREACJA SYSTEMU ZADAŃ WIELOPOZIOMOWYCH JAKO ŚRODKA MONITOROWANIA OSIĄGNIĘCIA EDUKACYJNE UCZNIÓW

STRESZCZENIE

W artykule przedstawiono technologię kreacji systemu wielopoziomowych zadań przedmiotu dyscypliny akademickiej, w celu monitorowania osiąganych efektów kształcenia. Zakłada ona sekwencyjną realizację takich etapów: identyfikacja źródeł informacji edukacyjnej i naukowej, ich badanie i selekcja, tworzenie materiałów dydaktycznych (struktura logiczna i semantyczna oraz zarys tematu), określenie poziomu asymilacji dla każdej koncepcji tematu, opracowanie zadań z wykorzystaniem konstruktora. Wdrożenie przedstawionej technologii umożliwia osiągnięcie następujących rezultatów: ukształtowanie rzeczywistych treści kształcenia, określenie wymaganego poziomu przyswajania informacji, realizacja funkcji monitoringu informacyjnego, formatywnego i korekcyjnego, za pomocą systemu wielopoziomowych zadań.

SŁOWA KLUCZOWE

zadania wielopoziomowe, struktura logiczna i semantyczna, poziomy przyswajania informacji edukacyjnej.