UDC 37.026.6

Forms and methods of enhancing the cognitive and mental activity of students

Izguzhina Regina Ravilievna
Undergraduate
Nizhnevartovsk State University, Russia
Skorobogatova Olga Nikolaevna
Candidate of Biological Sciences, Associate Professor
Nizhnevartovsk State University, Russia
Pogonysheva Irina Aleksandrovna
Candidate of Biological Sciences, Associate Professor
Nizhnevartovsk State University, Russia

Abstract. The article discusses the importance of using a complex of pedagogical techniques for enhancing the mental and cognitive activity of students in order to improve the quality of knowledge. Variants of the combination of active components of educational activity are proposed. The author reveals the importance of dynamic forms and techniques in teaching methods that allow students to form a conscious attitude to learning activities.
Keywords: education, active forms of learning, play, non-standard methods.

Modern education is undergoing a period of dynamic renewal. At the moment, many innovative technologies, various organizational forms and content are being improved. Particular attention is paid to the ability to imagine and simulate a particular situation, to master communication skills and gain experience in conducting discussions and dialogue. Creative activity plays an important role in the education system [1].

Certain requirements are currently imposed on students: it is necessary to have not only certain knowledge, skills and abilities, but also to have great potential that allows them to realize themselves in life, independently learn and develop their life positions. Fundamental changes also affected the role of the teacher in the educational process. He is no longer viewed as an informant, but becomes a real stimulator of thinking [6-8].

Statistics indicate a significant decline in students' interest in the learning process. Intellectual passivity is a problem on the way to improving the educational system. Cognitive activation is an important aspect in education. The provision of ready-made material in most cases causes difficulties for students, which consist in the inability to apply knowledge in certain situations [2].

The relevance of this topic is explained by the updating of federal state educational standards, an emphasis is placed on the formation of skills among students, which allow not only to assimilate, but also to implement the acquired knowledge in practice; to form the ability to navigate in the existing non-standard situations; form the ability to independently solve educational problems; information processing skills, its search, structuring and interpretation; carrying out mental operations associated with data analysis, comparison and comparison [3].

The aim of the study is to study, develop and implement a complex of pedagogical techniques for enhancing the mental and cognitive activity of students in order to increase the level of learning.

An experimental study was carried out at the Department of Ecology FSBEI HE Nizhnevartovsk State University (NVSU), in which 3-year students of the direction "Ecology and Environmental Management" (6 semesters of 2020 and 2021 of study) and students of municipal secondary schools of Nizhnevartovsk who were preparing for the USE and the BSE took part at the Quentin training center.

In the course of our work, we used methodological developments, techniques and forms, the main purpose of which is the practical orientation of the students' activities in the classroom, the creation of conditions for their motivation, aimed at independent educational work. Thus, students form an active life position, develop motivation for self-education, master the skills and psychological attitudes to independent search, selection, analysis and use of information.

For schoolchildren were offered two forms of control on the topic "Cytology and microscopy".

In the first version, the students completed test tasks for 15 minutes, in the second they performed tasks in a playful way. In the context of distance learning, a multifunctional service for testing in Google forms was used as a knowledge test. Questions with different levels of difficulty were selected for testing. The content of the test is expressed in one of four basic forms of tasks: tasks with the choice of one or more correct answers from among the proposed ones; tasks of an open form, where the subject writes the answer himself; assignments to establish compliance; assignments to establish the correct sequence of actions.

The game took place in two stages: Stage I – "Guess". During this stage (15 minutes), the student pulled out a card with an assignment on which the statement is presented. Assignment: to give an answer "true" or "false" for a given statement. If the answer was correct, a point was awarded to the respondent's team, the right to answer questions is transferred to the next student. In case of an incorrect answer, the team loses the right to answer the question and skips the move. At the end of this stage of the game, points are entered into the score sheets. Stage II - "Find". There is a general view of the microscope on the board. Each of the participants draws out a card with the

name of individual parts of the microscope and locates it on the general view. Points were awarded for correctly found parts of the microscope and then summed up.

Experimental results and their discussion. The level of absolute knowledge of schoolchildren after testing was 53-80%. Based on the results of processing the test results, the formed concepts, representations, as well as residual knowledge were checked.

The level of quality knowledge as a result of testing after the game was 80-100% (fig. 1.).

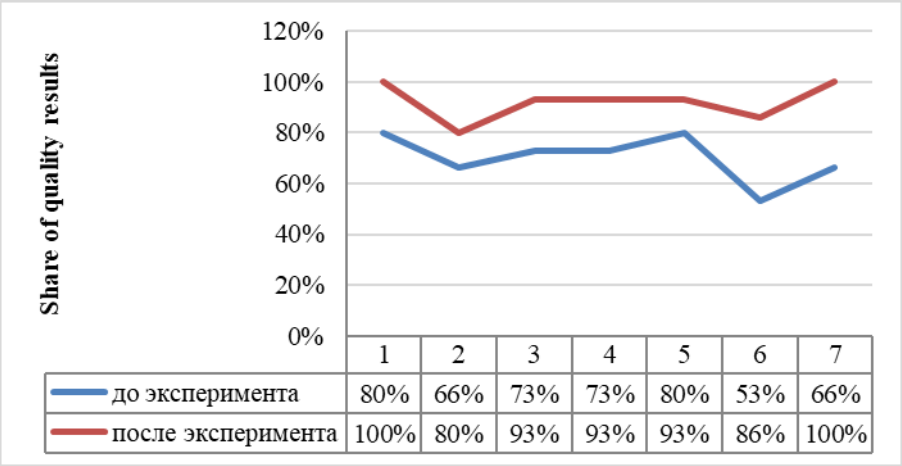

Fig. 1. The results of testing schoolchildren before and after the experiment,%

The data obtained indicate that the effectiveness of the lessons, in which the students were in motion and performed practical work with the elements of the game, turned out to be higher. The average indicator of the effectiveness of the quality of students' knowledge during passive testing was 70%, after an active experiment (game) - 92%.

Upon completion of the game, students were surveyed. Analysis of the questionnaire shows a positive attitude of respondents to the use of didactic games (tab. 1).

Table1

Results of student questionnaires,%

Reasons for a positive attitude towards the game	Number of positive answers, %
Classes are more interesting	100
Found out new additional material	67
The material is better remembered	89
There is an opportunity to express your opinion	23
Welcoming atmosphere	78
Using the knowledge gained in other lessons	23

In another experiment, 2 groups of 3rd year students of the NVSU "Ecology and Nature Management" direction took part.

With them were held 3 practical seminars on the discipline "Fundamentals of geochemistry and geophysics of the environment." The purpose of the seminars is the acquisition of new knowledge, skills and abilities by students, necessary for professional activity, the development of their humanitarian thinking and intellectual abilities as a means of individual development of the academic discipline, and all this requires careful preparation for classes.

The first group of 3-year students (control) of the E&P direction (6 semester 2020) studied the discipline using standard methods (conversation), in a distance format in the context of the Covid-19 pandemic.

The second group of the 3rd course of the direction of E&P (experimental) studied the discipline in offline conditions. Assignment: students in the allotted time presented certain questions of the seminar lesson. To consolidate the studied material, a game was conducted in the form of crosswords and a survey on the conceptual apparatus (glossary). Checking the effectiveness of the students' work at the experimental seminar was carried out by the testing method.

The obtained results of learning were compared using the methodology for calculating the SLD (student's learning degree), the quality of knowledge, academic performance (absolute and qualitative) [5].

Based on the results of a comparative analysis of the quality of academic performance and the quality of knowledge in the control and experimental groups, it should be noted that the effectiveness of training in the control group is lower than in the experimental one (tab. 2.).

Table 2

The results of academic performance, the quality of academic performance and learning in the control (contr.) and experimental (exp.) groups

№ of seminar	3'th seminar		4'th seminar		5'th seminar		Averaged, %	
№ of group	Contr.	Exp.	Contr.	Exp.	Contr.	Exp.	Contr.	Exp.
Academic performance, %	48.15	61.54	37.04	42.31	40.74	61.54	41.97	55.13
Knowledge quality, %	25.93	46.15	25.93	26.92	37.04	39.23	29.63	37.43
Trainedness, %	32.30	38.15	26.81	27.38	35.11	38.46	31.40	34.66

The average percentage of progress in the experimental group increased by 13%. The indicators of the quality of knowledge and the level of training, respectively, are 8% and 3% higher in the experimental group.

According to the results of the third seminar lesson, the analysis of progress is the highest in the experiment, the difference with the control group is 13%. The quality of the knowledge gained

and the level of training in the experiment, when compared with the control, increases, respectively, by almost two times by 6%. The results of the experiment of the following stages confirm the earlier results.

Distance learning leads to a weakening of the contact between the subject and the object of the educational process, the psychoemotional connection between the teacher and the student, the deterioration of the ability to objectively assess the knowledge and the level of formation of the student's competencies. Therefore, the forced remote form of work during a pandemic should not supplant the traditional form of work when coming out of a state of self-isolation.

An unconventional form of conducting classes is one of the methods, or technologies, that make it possible to increase the activity, independence and interest of students in the learning process, make educational activities personally significant, and significantly facilitate the process of acquiring new knowledge and skills.

Learners who take part in forms close to practice gain important and especially valuable skills. They can simulate different situations and gain experience. Students are told the rules of the game, the tasks and other important aspects of entertainment are explained, which will help to achieve the goal and come to the desired result [4]. Performing practical work and being on the move, students memorize basically all the material studied in class.

References

1. Alekseev, M.Yu. Application of new technologies in education / M.Yu. Alekseev, S.I. Zolotov. - Troitsk, 2005. 62 P.
2. Bordovskaya, N.V. Modern educational technologies / N.V. Bordovskaya, L.A. Darinskaya. - M.: Knorus, 2011. 269 P.
3. Davydov V.V. Problems of developing education / V. Davydov, D.B. Elkonin. K.: Osvita, 2006. 240 P.
4. Kruglikov V.N. Interactive education in higher education: problems and prospects / V.N. Kruglikov // Scientific and technical statements of SPbSPU. Humanities and social sciences.2013. № 4 (184)
5. Simonov, V.P. The main criteria and indicators of the effectiveness and quality of training. Pedagogical diagnostics at school and university [Text]: textbook/ V.P.Simonov. – M., 2008.
6. Skorobogatova O.N., Izguzhina R.R.Discussion in the school course of biology // Modern social and humanitarian research: theoretical, methodological and applied aspects: a collection of scientific papers based on the materials of the International scientific and practical conference on November 30, 2019.:in 2 hours / Under total. ed. E. P. Tkacheva. Belgorod: LLC Agency for Advanced Scientific Research (AASR), 2019. Part II. P. 115-123.

7. Izguzhina R.R., Skorobogatova O.N. Intellectual game "Environmental brainstorming" // Intellectual game "Environmental brainstorming" // Materials of the VII All-Russian scientific and practical conference with international participation (Nizhnevartovsk, November 12, 2019) / ex. ed. D.A. Pogonyshev. Nizhnevartovsk: Nizhnevartovsk State University, 2019. P. 431-434.
8. Skorobogatova O. N., Pogonysheva I. A. Algae as an object of students' research work // Education and pedagogy: theory, methodology, experience: collection of articles (Cheboksary, December 29, 2019). Cheboksary: Publishing House "Wednesday", 2019.