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ABSTRACT

of the dissertation for the degree of Doctor of Philosophy

THE USE OF NEW LEARNING TECHNOLOGIES IN INCREASING THE COGNITIVE ACTIVITY OF SENIOR STUDENTS

Speciality: 5804.01 – General pedagogy, history of pedagogy and education

Field of science: Pedagogy

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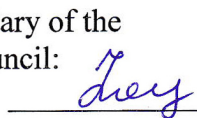
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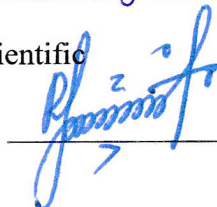
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GENERAL CHARACTERISTICS OF THE RESEARCH

The relevance and usage degree of the theme. In modern times, when science and technology are rapidly developing, it is very difficult to achieve success without having flexible thinking, practical knowledge and skills. The 21st century in which we live is a century of scientific and technological progress, innovation and modernization, requiring everyone to acquire deeper systematic knowledge, vital skills and habits. The increase of a person's intellectual potential is one of the most important conditions for his life and activity. All this is taken into account in the formation of the content of education, in addition to theory, the importance of practical knowledge and skills, competence is focused. Competency-based education that enables the individual to acquire knowledge and skills that result from a particular activity will better serve society. It is for these reasons that the content of curricula is constantly being developed, as a result of which a new approach to education is constantly required. The decree of the President of the Republic of Azerbaijan dated October 24, 2013 was approved on this basis, the State Strategy for development of education in the Republic of Azerbaijan was developed. The document outlines five strategic areas, the second direction envisages modernization of human resources in education. This direction includes the formation of effective, competent teachers with the use of modern teaching technologies and the creation of a complete new education system.

All of this requires a new approach to student activity that a modern teacher must have many qualities to accomplish. This, first of all, actualizes the purposeful organization of cognitive activity of students in general education schools, as well as the use of new learning technologies for this purpose. Raising the cognitive activity of students, including senior students, creates opportunities for them to independently acquire new knowledge, justify their position in the discussion of issues, and form the necessary qualities for the personality, such as competitiveness.

Studies have shown that studies have been conducted on individual aspects of improving the cognitive activity of students. If

in the 50s of the last century the study of features of mental development in students was considered as one of the urgent problems of age and pedagogical psychology, in the 1960s various studies on this problem appeared (M.F.Morozov, A.I.Lipkina, S.F.Juykov, Z.M.Kolmikova, N.M.Studienko, etc.). In our republic, the research of A.Bayramov, under his leadership, the dissertations of O.Karimov and R.Javadov, devoted to this problem, were defended. The articles in the Azerbaijani School magazine and the Azerbaijani Teacher newspaper have been published not only by psychologists, but also by educators and methodologists, primarily on the subject of development of mental qualities in students, independence and critical thinking, but it did not give the anticipated result.

In order to effectively build the learning process and achieve the set goals, a teacher must have the necessary knowledge of Psychology and be able to benefit from the latest achievements of Pedagogy. In this case, the learning process is clearly understood both in Pedagogy and Psychology. These issues were highlighted by psychologist L.T.Ohotina in the 70s of the last century. In Azerbaijan, A.Alizade in his book “Psychological problems of Modern Azerbaijani School”, attributed the reason why teachers did not benefit from the successes of psychology to the one-sided differentiation of pedagogical sciences and the anti-psychological atmosphere created by the traditional pedagogical system in schools.¹

It should be noted that even in the 70s, eminent psychologists and educators put forward interesting ideas about schoolchildren's interest in learning. It is clear that the interest in training is directly related to cognitive activity. The researchers stated that training interest can be conditioned by many motives. The most basic of them are as follows:

1. Social motives. They begin to manifest themselves in the lower classes. “I want to be educated and contribute to my homeland!” In high school, a student who wants to be self-conscious

¹ Alizade, A. Psychological Problems of Modern Azerbaijani School / A.Alizade. Baku: Ozan, - 1998. – p. 24-25

tries to understand these issues.

2. Cognitive motives. A student wants to gain new knowledge. It is interesting for him. It should be noted that cognitive morality is the most important condition that enables cognitive activity to function.

3. Spiritual motives. They play a major role in shaping the student's personality. The student understands the moral obligation to the community, parents, and teachers. He tries to fulfill his duties with dignity. Overcomes difficulties. He tries to cope with the sometimes tedious and uninteresting tasks.

4. Motives for communication. It is interesting for the student to learn together with his/her friends, to exchange ideas.

5. Motivation for self-education. This is especially noticeable in senior students. Thanks to this, the students always want to constantly develop. At the same time, they are well aware of the importance of various disciplines.

In fact, each of the motives shown here is associated with cognitive activity to one degree or another. However, a separate place was given to cognitive motives in the study. Because students' acquisition of new knowledge is primarily based on cognitive motives. Therefore, cognitive motives play an important role in increasing the cognitive activity of high school students. In general, what has been said is as relevant today as it was yesterday. Forming and developing all these motives in the student is a very difficult process. And the teacher who wants to cope with these tasks, of course, should benefit from the successes of psychology and pedagogy.

As students get older and their worldviews expand, any or more of the learning motives we are talking about can become dominant.

Creating and developing cognitive interest and enhancing cognitive activity is a very important and responsible task for students during their career choices. The exemplary personality of the teacher, the creation of a work atmosphere in the classroom, the ability to connect training with life and a fair assessment can be the motives for the diligent work of students. And, of course, during this

process new learning technologies may help the teachers. Through them, learning is justified, fun is provided in teaching, and a business atmosphere is created.

All of this ensures that students are constantly on the lookout, which is one of the most important psychological bases of the learning process.

Thus, modern development trends and the expansion of the possibilities of application of educational technologies in teaching will create favorable opportunities for solving many problems related to education, including increasing the cognitive activity of senior students. At the same time, educational programs and textbooks are improved, in the context of educational technologies, the educational process in schools is organized and conducted at a level that resonates with new requirements. All this makes it necessary to involve the existing programs, textbooks and teaching aids, lessons in our modern schools, and other forms of training organization in the research. The problem is very important and relevant in modern times. This has caused us to turn to such a topic.

In current time of thought pluralism, the importance of mental qualities: independence, critical thinking, and imagination, is growing. The society needs creative personalities and they should be brought up in school today. Special attention should be given to the development of student imagination for creativity.

Analyzing the work experience of schools in detail from this point of view, raising the cognitive activity of students by using new learning technologies and creating favorable conditions for the development of mental qualities in them is one of the current problems of the day. We also wanted to contribute to solving this problem.

It should be noted that, education and training is a historical-dialectical process, consisting of the acquisition and development of knowledge and skills. The essence, content, principles, forms and methods of the training have been analyzed at all times, generalizations have been made, and research papers on any specific problem have been published. The changing society, the state's development strategies, are reflected in the content and form of the

training. Education is conducive to the development of society. Its renewal is a requirement of time.

It is this innovation that brings up the problem of raising students' cognitive activity as one of the most important issues. Because scientific and technical progress reaches a very high level of development and achieves unprecedented achievements, it also gives rise to consequences that lead people to disasters. And in order to avoid disasters, such global tasks as the activation of the human mind, the sense of humanity, self-awareness, self-assessment, assessment of activities, relationships, strengthening the civic mission and so on have emerged. Under such conditions, the development of critical thinking, independent thought activity and practical work, including cognitive activity, which play an important role in mental results with new learning methods and forms of work, has come to the fore.

For this reason, new teaching methods and technologies are widely used, and much has been said and written about it. But there is still a need for research. This scientific search came from this necessity.

The problem was systematically addressed in the research. In general, the use of a systematic approach to work in the study of pedagogical problems has always been relevant. We observed this in the studies of N.Talizina, L.N.Landa, A.Rayef, V.P.Bespalko, T.A.Ilyina, I.I.Tikhinov and other pedagogues and psychologists. The use of a systematic approach in didactic research is considered legitimate, because any element of the didactic process meets all the requirements of a complex system and can lead to a systematic analysis. This is especially related to the problem of increasing the cognitive activity of students. The need for a systematic approach to the problem is also related to the following factors:

1. General pedagogy also includes the teaching methodology of various subjects. The problem is approached in the context of learning objectives, content, methods, forms and, finally, the means of teaching Azerbaijani language, Literature, Informatics, History, English.
2. Consideration of the training process as a management object,

the main components of new training technologies and the issues of directing the interaction between them to the improvement of training quality were explained.

3. With reference to the psychology of age, the psychology of the specific early youth period has been focused on, and age appropriateness has been taken as one of the main criteria in the selection of technologies.

The object of the research the process of introducing new learning technologies in increasing the cognitive activity of senior students.

The subject of the research is the role of new learning technologies in enhancing the cognitive activity of the students in upper grades.

The purpose of the research is to determine the role of senior students by examining the possibilities and ways of applying new learning technologies to achieve an increase in their cognitive activity, taking into account the characteristics of age and interest.

In accordance with the object, subject and purpose of the **research**, its following **objectives** are determined:

- to determine the scientific and theoretical basis of the problem;
- to comment on the problem and comment on it in the scientific and pedagogical literature;
- to examine the situation in school practice from the point of view of the problem
- to determine the possibilities and ways of using various types of modern lesson in increasing the cognitive activity of students;
- to determine the role of the use of new learning technologies in raising cognitive activity in other forms of organization of training;
- to justify that modern assessment technologies are one of the main tools that raise cognitive activity;
- to show the algorithm of ways to apply a number of new learning technologies that we consider effective in increasing the cognitive activity of senior students;
- to comment on the advantages of new assessment

technologies;

- to interpret which learning technologies are more effective in increasing the cognitive activity of senior students and to verify this in practice

- to summarize the results of the experiment.

Research hypotheses:

- if necessary education work is done with the teachers;
- if the current status of schools is highlighted;
- if teachers' answers are carefully examined, analyzed and necessary conclusions are drawn;
- if the selection of technologies corresponding to the age characteristics of senior students and ways to use them are indicated;
- if the importance of other types of training is explained, and it is noted that such technologies are more effective in the use of some technologies;
- if the ways of using new learning technologies are shown, information will be provided on interesting and necessary methods of increasing the cognitive activity of senior students, and their effectiveness will be proven through practice.

So, if new learning technologies are used, taking into account the age characteristics of senior students, focusing on the specific aspects of the subject, subject, the cognitive activity of schoolchildren will increase, and as a result, their learning achievements will be high.

The methodological basis of the research is the scientific literature on the age characteristics of senior students, their cognitive activity, the role of new learning technologies in its activation, didactic laws, patterns and world experience and theory formed in this area.

Research methods:

Empirical, theoretical, and empiric-theoretical methods were used in the research. Thus, observation, interview, induction, deduction, experiment, and mathematical methods were included in the research.

The scientific novelty of the research is that in the history of Azerbaijani pedagogical thought, the role of the use of new learning

technologies as a tool in increasing the cognitive activity of high school students has been determined, and its importance has been theoretically and practically justified.

The theoretical significance of the research is that it enriches pedagogical theory in this area by showing the possibility of using new learning technologies in the development of cognitive activity of senior students, opens up opportunities and ways for conducting new research, provides useful material for the didactics section of pedagogical science.

The practical significance of the research is that the study will be used in the training of teachers who meet modern requirements. Experiments in the research and their results will be a great material for teachers. The study will also be a useful resource for university teachers.

Main provisions for defense: The following provisions are issued to the defense:

- when designing the process of training senior students, all the features inherent in early youth should be taken into account when choosing training technologies;

- the use of learning technologies is one of the most effective means of increasing the cognitive activity of students;

- the use of new learning technologies develops students' creative abilities, which is a very important factor in our society today;

- modern types of lessons (active lessons, integrated lessons, non-standard lessons) are effective learning tools for high school students to realize their potential;

- new assessment technologies are effective tools for shaping self-awareness, social awareness and enhancing cognitive activity in students;

- it is necessary to use new training technologies in designing other forms of training.

Approbation and application of the research. The main provisions of the dissertation are reflected in 10 scientific articles, 9 theses covering its content. Regarding the results of the study, the author performed, at the scientific-practical conference “Education development strategy and its implementation” (2015), at the “XIX

Republican scientific conference of doctoral students and young researchers” (2015), at the international scientific conference “Priorities of Education Building in Azerbaijan: Modern approaches” (2015), at the scientific and practical conference “Pedagogical approaches in education: experience of the past and vision of the future” (2016), at the XX Republican scientific conference of doctoral students and young researchers (2016), at the VIII “Modernization of continuous education” international scientific-practical conference (2018), at the “Innovation, education quality and development” international scientific-practical conference (2017), at the “Education: Classical and modern approaches” international scientific-practical conference (2019, April 4-5).

The dissertation was completed at **Baku State University**.

The structure of dissertation: Dissertation consists of an introduction, 3 chapters containing 9 paragraphs, conclusion, a list of references and appendices.

Introduction 8 pages 14850 characters, Chapter I 47 pages 77486 characters, Chapter II 48 pages 85816 characters, Chapter III 47 pages 27278 characters, conclusion 4 pages 5864 characters, bibliography 18 pages, Appendices 3 page. The dissertation consists of 226545 characters in total.

THE MAIN CONTENT OF THE RESEARCH

In the **Introduction**, the relevance of the topic is justified, its object, subject, purpose, tasks, scientific innovation, methods, methodology, theoretical and practical importance, the provisions presented for defense are defined.

Chapter I, called “**Scientific-theoretical foundations of raising the cognitive activity of senior students**” includes three paragraphs.

The first paragraph is called “The essence of the problem, the scientific and theoretical basis”. What factors serve to improve cognitive activity are investigated. Citing reliable sources: “*The cognitive process-perception, consists of the perception of the objective world, its bodies and events in the human brain, which is a*

*very complex, dialectical process. The complementary stages of the cognition, and its advancement to abstract thinking without direct visual observation, constitute the basis of that activity. The process of generalization and comparison, which is of great importance in increasing activity, has a positive impact on the development and activation of thinking.”*²

In the new pedagogic textbooks, the analysis of pedagogical technology issues already occupies a special place. Various studies (B.P.Bespalko, I.P.Volkov, V.M.Monakhov, M.V.Klarin, G.K.Selevko, M.M.Mehdizadeh in Azerbaijan, N.M.Kazimov, A.A.Alizade, A.A.Aghayev, etc.) have been conducted, the theoretical and practical aspects of pedagogical technology issues have been analyzed.

In general, researches show that increasing the cognitive activity of senior students by implementing new learning technologies primarily involves the activation of cognitive processes: attention, emotion, perception, memory, thinking, imagination. This largely depends on the activity of the teacher, the method of approach to the problem, the ability to direct, stimulate, and develop the cognitive processes of upper-class students.

Studies have shown that in the scientific and pedagogical literature, the attitude was expressed to individual aspects of the use of new learning technologies in increasing the cognitive activity of students.

The work “Pedagogical technologies” by A.Mehrabov, A.Abbasov, Z.Zeynalov, and R.Hasanov are particularly important among useful works that will help teachers in the field of using new learning technologies in Azerbaijan. Referring to that book, we can say that *“technology is understood as a way of performing a task using special methods as a result of the application of a knowledge system in special fields.”*³

Now, in connection with the introduction of technical means of training, and recently computer equipment into the pedagogical

² Rzayev, B. Activation ways of the cognitive process / B.Rzayev – Baku: Shirvanneshr, - 2003. – s. 11

³ Mehrabov, A. Pedagogical technology / A.Mehrabov, A.Abbasov et al. – Baku: Muterjim, - 2006. - p. 21

process, the concepts of “pedagogical technology”, “educational technologies”, “learning technologies” are often used in modern didactics. Although the concepts of pedagogical technology and learning technologies complement each other in a certain sense, since the teaching process includes various social, socio-political, administrative, psycho-pedagogical, medical-pedagogical, economic, cultural and other aspects in addition to pedagogical aspects, “learning technology” (in the sphere of education) the concept of technology) is different from the concept of “pedagogical technology” (technology in the field of pedagogy).

In the second paragraph “Problem statement in the scientific and pedagogical literature”, the scientific and pedagogical literature on the problem is studied, generalizations and analyses are made.

Forming and raising students' cognitive activity, “activating cognitive activity” has been one of the central places in didactics for a long time. A number of valuable works related to this problem have been published. In this paragraph, referring to them, concepts and definitions necessary to describe new learning technologies in accordance with modern didactic principles were presented, information was given about many studies on the efficiency of using new learning technologies, among which the works of G.K.Selevko were specially emphasized. In these works, the information about each technology is scientifically based, comprehensive and of practical importance. Books take the reader to the world of rich technologies. They are the technologies of the past, present and future.

It should be noted that in the second paragraph called “Problem statement in the scientific and pedagogical literature”, in the new curricula approved in the nineties, the democratization, humanization and differentiation of educational work in schools as the basis of training established in the educational law-led to significant changes in the design of programs and textbooks. The use of new teaching methods, i.e. teaching technologies, becomes a necessity in moving from the school of memory to the school of thinking.

In the third paragraph, which is called “The situation in school practice in terms of the problem”, the situation in our schools related to the application of new learning technologies is described,

investigated, analyzed, and summarized.

Looking at the development of education in Azerbaijan, it can be clearly seen recent years that a great interest in pedagogical and training technologies, as well as teaching methods, has arisen in our country. However, due to the fact that some of the training technologies are new for Azerbaijan, there are also shortcomings, along with the achievements in this field.

Surveys conducted among the teachers of the schools № 30 34; 144; 251; 282; 285 in Baku; school №20 in Ganja, Lyceum named after M.Ibrahimovich the school №4 in Bilasuvar district give a basis for our opinion. Surveys were conducted with teachers in the following content:

1. What do you understand by new learning technologies?
2. Do you prefer traditional methods or new training methods?
3. How would you like to learn new learning technologies?
4. What do you pay attention to when using new learning technologies during teaching in upper classes?
5. In your opinion, does the quality of teaching affect the absenteeism of senior students?
6. What assessment tools do you use when evaluating the learning outcomes of high school students?
7. Which of the assessment tools you use in upper classes do you prefer?
8. In what aspects do you consider your preferred assessment tool to be more optimal than others?
9. What do you understand when you say a learning situation that directs students' cognitive activity in a positive direction?
10. Is it possible to use educational technologies in creating learning situations that direct students' cognitive activity in a positive direction?
11. What is your attitude towards modern textbooks? How are they different from traditional textbooks?

An online survey was also conducted through the Internet to paint a more accurate picture of the situation in our schools.

The analysis of the answers showed that despite the fact that certain works are being carried out in our republic regarding the

study of new learning technologies and their application, it is necessary for teachers to acquire certain knowledge and skills in this field. This can be clearly seen from the diagram below.

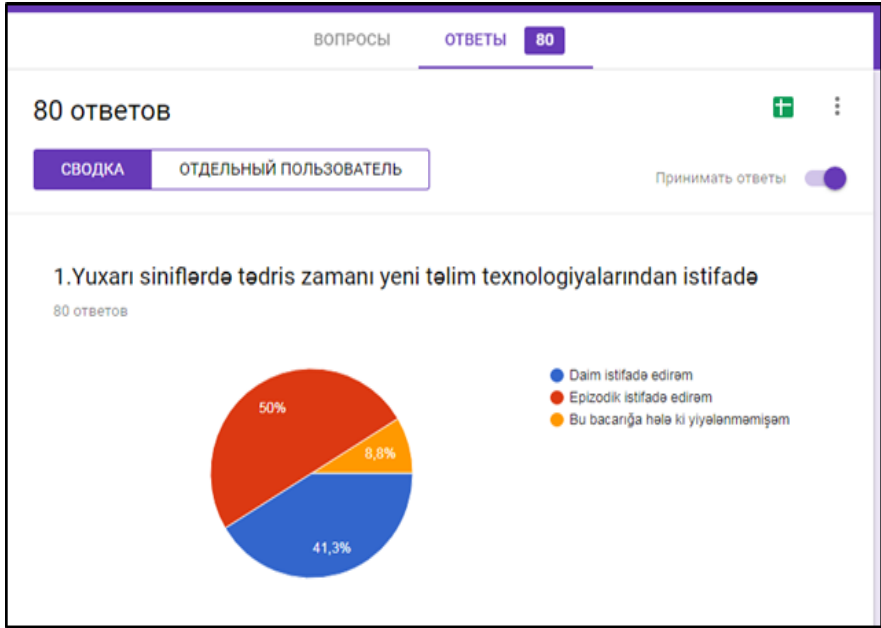


Diagram. Results of the survey conducted among teachers

Chapter II, titled “**Ways to use new learning technologies to increase the cognitive activity of senior students**”, combines three paragraphs entitled “The use of various types of modern lesson as a condition for increasing the cognitive activity of students”, “The role of the use of new learning technologies in other forms of organization of training in increasing cognitive activity”, and “Modern assessment technologies as one of the main means of increasing cognitive activity”.

The first paragraph entitled “The use of various types of modern lesson as a condition for increasing the cognitive activity of students” provides information on active, integrative and non-standard lessons and the following conclusions were made:

- active learning does not deny memory

- active learning has interactivity its own nature;
- active learning technologies develop logical, critical, creative thinking in students;
- using active learning technologies, the teacher achieves the improvement of students ' cognitive activity.

Integrative lessons

- make learning active and entertaining;
- develop students' ability to analyze and synthesize;
- provide a deeper and more comprehensive understanding of the content;
- provide study of two or more different subjects of the same subject;
- coordinate different stages of training;
- stimulate development of high level of achievement and intellectual abilities.

Non-standard lessons are an excellent tool for eliminating cognitive barriers in students who frequently encounter

- emotional;
- motivation;
- communicative barriers.

Finally, the conclusion was reached that, in fact, the purposeful use of modern types of lessons is the main condition for increasing the cognitive activity of students.

The second paragraph entitled “The role of the use of new learning technologies in other forms of organization of training in increasing cognitive activity” talks about the fact that, along with classes, which are the main form of organization of training, other forms of organization of training play an important role in achieving the goals set. Out-of-class work is presented with a new look in line with modern requirements. A number of techniques if used to make the learning interesting, Sinectics is one of them. It is emphasized that this technique is very effective for the development of students' creative abilities. It is emphasized that this technique is very effective for the development of the student's creativity. Thus, the Synectics method rapidly develops logical and creative thinking in students, strengthens the process of assimilation, and the learned knowledge is

not forgotten for a long time.

The algorithm of this technology is as follows:

- 1) *Setting the problem;*
- 2) *Problem analysis and information approach;*
- 3) *Understanding the problem;*
- 4) *Application of different ideas and analogies to solve the problem;*
- 5) *New ideas and analogies related to the problem;*
- 6) *Emergence of a new idea;*
- 7) *Development and concretization of a new idea.*

The purpose of using Ssynectics technology is to develop the creative abilities of students in the process of improving objects and processes. In other words, it is the development of abstract thinking. And this, as we know, is one of the highest steps of cognitivity.

It should be noted that in the research recently, ideas were given regarding the use of Cooperation and Module technologies in modern classes, and their effectiveness and possibilities of use were discussed.

Collaboration technologies is an interactive process that connects two or more participants. So, we will not be mistaken if we say that they are a group of participants united to achieve goals together that they cannot achieve separately.

Module technologies form the skills and habits of students to work independently. They develop independence of thought. There are 3 levels of independence of thought:

1. Diffuse level;
2. Formal level;
3. Creative level.

Module technologies based mainly on independent activity are effective training methods in increasing the cognitive activity of students.

From the above, it can be concluded that, in general, the use of new learning technologies in various forms of training organization has a great role in increasing the cognitive activity of senior students, and systematic organization of work is important from the point of view of the problem.

The third paragraph, entitled “Modern assessment technologies as one of the main means of increasing cognitive activity” provides a justified explanation of how contemporary assessments play a key role in shaping students' identity and enhancing their cognitive performance. At the end of the sub-chapter, the following proposals were made:

1. Carrying out the necessary educational work with teachers;
2. Organization of expert supervision in schools to control how much the questions and tasks in the summative assessment samples prepared by teachers measure the level of assimilation of content standards and their compliance with the age level of students;
3. Provide students with self-assessment, lesson, teacher and peer assessment sheets, and results analysis during school monitoring.

Thus, modern assessment allows comprehensive and systematic monitoring of student development:

- diagnostic evaluation plays a big role in organizing the teacher's future activities correctly;
- self-assessment develops self-awareness in the student.
- the use of assessment samples based on the criteria used in daily classes creates favorable conditions for the realization of the determined learning outcomes.
- summative assessment allows to collect more detailed information about student's knowledge and skills.

Therefore, the correct use of modern assessment increases the cognitive activity of students as a result.

The third chapter entitled **“Organization, conduct and results of experiments”**, combines three paragraphs: “Planning of the experiment”, “Technology of conducting the experiment”, “Generalization and evaluation of the results of the experiments”.

During the planning of the experiments, schools were identified: In the city of Baku №- 30, 34, 144, 251, 282, 285 secondary schools, lyceum named after M.Ibrahimov, №-4 secondary school in Bilasuvar, №20 school in Ganja were

identified. Five subjects were used during the experiments: Azerbaijani language, Literature, History, English, Informatics. The experiments were conducted in 2017-2018.

The experiments covered three stages.

1. Determinant;
2. Educational;
3. Testing.

The tasks set during the preparation phase of the pedagogical experiments were the following:

1. To identify gaps in the use of new learning technologies;
2. To identify the causes that provoke these shortcomings and difficulties;
3. To identify the appropriate pedagogical system for eliminating shortcomings;
4. To determine the appropriate training technology system in order to develop the cognitive activity of the senior students.

The following activities were carried out to carry out the experiments:

- themes for discussion were identified;
- experimental and control classes were identified;
- monitoring was conducted to determine the level of knowledge of students in classrooms.

During the course of the experiment it was found that

a) the use of new learning technologies will increase students' interest in the classroom, making learning more manageable;

b) the students are pleased with the results of their work, their enthusiasm for the subject increases, and they work harder;

(c) students come to the lesson prepared every day, they know that, as usual, their knowledge will be promptly checked today;

(d) information is received about each student in each lesson, the general dynamics of mastering the class is monitored, the necessary assistance is provided;

e) students are more easily aware of new topics in comparison with the previous period, because the previous topics have been studied consistently, the connection between them has been established, gaps in students' knowledge have been gradually

eliminated, thus they have become more prepared for understanding the next topics;

f) in the learning process, time is effectively used, knowledge is given to more students in less time, the time for students to be free in the lesson is reduced, they are constantly in active activities.

This can also be seen in the tables showing the pre- and post-experiment results of literary students (Table 1, 2).

Table 1
The results of experiments on the subject of literature

Schools	Classes	Number of students	Marks				5 and 4, %	Perception in assesment, %	numerical average
			5	4	3	2			
Baku, № 30	Experimental – X	15		3	7	5	20.0	37.0	2.9
	Control-X	21	4	3	9	5	33.3	42.0	3.3
	Experimental –XI	26	3	6	12	5	34.6	50.0	3.3
Baku, № 34	Experimental- X	26	6	7	9	4	50.0	61.0	3.6
	Control-X	27	6	8	10	3	51.9	61.0	3.6
	Experimental- XI	25	6	5	10	4	44.0	60.0	3.5
	Control-XI	26	6	7	11	2	50.0	63.0	3.7
Baku, № 144	Experimental- X	21	4	2	12	3	28.6	44,3	3.3
	Experimental- XI	21	4	5	8	4	42.9	52.0	3.4
	Control-XI	20	5	4	9	2	45.0	58.0	3.6
Baku, № 251	Experimental- X	26	7	6	9	4	50.0	64.0	3.6
	Control-X	25	6	7	8	4	52.0	61.0	3.6
	Experimental- X	26	6	8	8	4	53.8	66	3.6
	Control-XI	26	7	8	9	2	57.7	65	3.8
Baku, № 282	Experimental- X	23	8	5	6	4	56.5	69	3.7
	Control-X	26	8	7	8	3	57.7	68	3.8
	Experimental- XI	13	3	4	3	3	53.8	73	3.5
	Control-XI	21	7	5	7	2	57.1	72	3.8
Baku, № 285	Experimental- X	14	3	3	7	1	42.9	58	3.6
	Control-X	20	6	5	5	4	55.0	64	3.7
	Experimental- XI	22	6	5	8	3	50.0	63	3.6
	Control-XI	22	7	5	7	3	54.5	70	3.7

Table 1 continuation

Baku, № 262	Experimental- X	20	4	5	10	1	45.0	55	3.6
	Control -X	19	6	5	6	2	57.9	55	3.8
	Experimental-XI	16	3	3	8	2	37.5	50.0	3.4
	Control-XI	22	6	5	10	1	50.0	61.0	3.7
Bilasuvar district, lyceum named by M.Ibrahimov	Experimental-X	10	8	2			100.0	90.0	4.8
	Control-X	9	8	1			100.0	93	4.9
	Experimental XI	8	6	2			100.0	89	4.8
	Control- XI	10	8	2			100.0	95	4.8
Bilasuvar district, №4	Experimental-X	20	4	4	10	2	40.0	53	3.5
	Control-X	21	7	5	7	2	57.1	61	3.8
	Experimental- XI	19	5	4	8	2	47.4	60	3.6
	Control-XI	27	8	5	9	5	48.1	60	3.6
Ganja, №20	Experimental-X	23	5	4	11	3	39.1	53	3.5
	Control-X	23	8	4	8	3	52.2	60	3.7
	Experimental- XI	22	4	6	8	4	45.5	58	3.5
	Control-XI	23	6	6	9	2	52.2	60	3.7

Table 2
Experimental and ratio of control class results
in schools on the subject of literature

Schools	Classes	Ratio of results of experimental and control classes	
		K_x	K_y
Baku, №30	X	0.88	1.09
Baku, №34	X	1.00	1.05
	XI	0.95	1.03
Baku, №144	XI	0.94	1.06
Baku, №251	X	1.00	1.03
	XI	0.95	1.03
Baku, №282	X	0.97	1.05
	XI	0.92	1.05
Baku, №285	X	0.97	1.05
	XI	0.97	1.03
Baku, №262	X	0.95	1.03
	XI	0.92	1.03
Bilasuvar district, Lyceum named by M.M.Ibrahimov	II q	0.98	1.00
	III q	1.02	1.02
Bilasuvar district, №4	X	0.92	1.05
	XI	1.00	1.08
Ganja, №20	X	0.95	1.05
	XI	0.95	1.03

Talking about the technology of the experiments, we would like to note that students were taught integrated lessons using Azerbaijani language, English, History, and Literature subjects, non-standard lessons were organized on the epic of “Kitabi Dada Gorgud”, learning technologies which are not commonly used by teacher were used in active/interactive lessons, in other organizational forms of training creativity-focused technologies, especially Sinectics were applied. Senior students were periodically handed out sheets of self-assessment, assessment of others, the results were discussed. Students were given project plans. A teacher who uses projects understands the benefits of using new learning technologies. Thus, during the implementation of projects, students' logical, critical and creative thinking develops. They see any problem and investigate ways to solve it. Finally, they come to a mental conclusion.

There are several systems that help teachers in the selection of methods and techniques for increasing the cognitive activity of students. Among them, the most famous is the cognitive taxonomy of Chicago University professor B.Bloom. Special attention was paid to the stages of analysis, synthesis and evaluation during the development of the project in order to ensure the improvement of students' cognitive activity. Thus, the formation and development of analysis, synthesis and evaluation skills in schoolchildren forms a high-level thinking ability in them. The following list was used to develop high-level thinking skills in students when preparing projects:

1. Separating into types;
2. Comparing;
3. Choosing;
4. Analyzing;
5. Creating;
5. Preparing a diagram;
6. Presenting assumptions;
7. Planning;
8. Preparing a report;
9. Evaluating;

10. Making a decision, etc.

Thus, the analysis of the results of the experiment shows that the use of new learning technologies in the development of logic, critical, creative thinking in students of X-XI classes has been successful.

Research of scientific and pedagogical literature, periodical press, interviews with principals of secondary schools, teachers of various subjects, 10-11th grade students, analysis of pedagogical experiments conducted in different regions of our republic allow us to draw the following conclusions:

1. Theoretical problems of the use of technology in the teaching process of the disciplines in the scientific and pedagogical and scientific-methodological literature have not been fully explored and have not been thoroughly analyzed.
2. The problem of the impact of the use of new technologies in secondary schools has not been extensively studied in the context of schools in the Republic of Azerbaijan.
3. No theoretical or practical considerations regarding the age of the student in the selection of technology and the creation of an effective learning environment through technology have been clarified.
4. Surveys, lessons, and experiments conducted via the Internet suggest that most teachers have difficulty using new learning technologies in a purposeful way.
5. In upper grades, the training does not fulfill its educational, educational and developmental functions.
6. Intra-school assessment does not promote cognitive functioning.

The main reasons for these are:

- most teachers, although they know the names and algorithm of learning technologies, do not sufficiently understand the harmfulness of their use, often use them just for the sake of innovation;
- most teachers have a very low level of knowledge in psychology;

- teachers still have difficulties in preparing assessment samples;
- after the diagnostic assessment, they almost do not make changes to their work plans;
- self-assessment is carried out in very few cases;
- generalization and analysis of the results of diagnostic and self-assessment patterns is hardly given any importance.

The results of the research allow us to say that if new learning technologies are used purposefully, taking into account the age characteristics of the student,

- they will provide
- development of cognitive processes necessary for the development of creative thinking;
- development of vital logical and critical thinking;
- development of the ability to listen to others;
- development of figurative thinking;
- development of the ability to draw mental conclusions.

In the study, many training methods not applied in Azerbaijani schools were shown, their algorithm, ways of application, their effectiveness were informed, hypotheses were tested in practice and positive results were obtained.

Individual, creative, cognitive, reflective features arising from their age characteristics were also kept in the attention in solving such a problem as increasing the cognitive activity of students.

A student will draw a rational conclusion as a result of his own values, personal experience, independent work and ability to judge. To formulate all of this, technology has been proposed in the study, hypotheses have been proposed and tested through experiments. The study showed that the possibilities and ways of using new learning technologies in increasing the cognitive activity of senior students are wide. Various types of classes, other forms of organization of training and the use of modern assessment technologies have a significant impact on improving the cognitive activity of senior students. The study allows the following proposals to be put forward:

1. Activation of cognitive activity of students should be a key factor in teacher focus.

2. The teacher should use modern learning technologies to achieve this goal. They should be used as the main means to achieve the goal, not for the sake of fashion.

3. A modern teacher must know the age characteristics of the student and keep them in focus.

4. The modern paradigm of education should be directed towards the development of personality-oriented education.

5. Training should be provided through the cooperation of all participants in the educational process.

6. The development of cognitive activity should not only be the main goal of training, but also the basic methodological basis of education as a whole.

7. Each teacher should not only introduce students to the subject, but also to develop different mental qualities in them, to form national and universal values in them.

8. Attention should also be given to other forms of training.

9. Teachers should have a thorough knowledge of assessment technologies and be able to use them appropriately.

10. Out-of-school and out-of-class activities should be conducted to promote cognitive activity of students, meetings with different scholars, writers, public and political figures should be organized.

The results of the dissertation work are published in the following articles and theses:

1. “The role of integrated lessons in the development of cognitive activity of students” // Materials of the VII Republican Scientific-Practical Conference “Education Development Strategy and Its Realization”, dedicated to the 92nd anniversary of the National Leader Heydar Aliyev, – Baku, – May 7, 2015. – p. 317-323.

2. “Active Learning: Essence, Characteristics”, International Language and Literature International Scientific-Theoretical Magazine // – Baku: Language and Literature, – 2015, – p. 259–262.

3. About some learning technologies recommended for use in enhancing cognitive activity of pupils // “Materials of the XIX

Republican Conference of doctoral students and young researchers, Ministry of Education of the Republic of Azerbaijan”, – Baku: – April 7-8, 2015. – p. 292-294.

4. “From traditional teaching to active learning” // “Materials of Azerbaijan Education: Modern Approaches” Proceedings of the International Scientific Conference, – Nakhchivan: – June 5-6, 2015, – p. 191-193.

5. “Use of teaching situations to guide students' cognitive activity in a positive way” // “Azerbaijan Language and Literature Teaching”, No.1, Baku-2016, Science and Education. p. 24-31.

6. “Text tests as one of the technologies used to assess student achievement” // “Assessment of Student Achievement: Creating Content and Means”, Materials of the International Scientific Conference, – Baku: – June 25, 2016. – p. 96-98.

7. “The role of assessment technologies in enhancing cognitive activity of high school students”// Pedagogical Approaches in Education: The Past and the Future, Republican Scientific and Practical Conference, – Baku: May 5, 2016, – p. 157–159.

8. “The use of new learning technologies in school practice” // Materials of the 20th National Conference of Doctoral Students and Young Researchers, – Baku: – 2016, May 24-25, – p. 370-372.

9. “Kitabi-Dede Gorgud” Episode and Non-Standard Lessons” // “Priorities of Azerbaijan Education Policy: Contemporary Approaches”, International Scientific Conference, – Nakhchivan: – November 25, 2016, – p. 290-291.

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12. Ways to increase the cognitive activity of senior students // – Baku: Actual problems of studying the humanities, – 2017, № 1, – p. 316-323.

13. “The essence of the concept of modern learning

technologies” // – Baku: – Pedagogical University News, – 2017. №1, – p. 211–217.

14. Роль современной системы оценки при повышении активности сознания учеников высших классов // “Материалы VIII Международной научно-практической конференции”, – Дербент: – 30 июня-2 июля 2017. – с. 208-211.

15. Способы активизации интеллектуальной деятельности старшеклассников в свете нового педагогического мышления // “Материалы IX Международной научно-практической конференции”, – Дербент: – 30 июня-2 июля 2018. – с.142-144.

16. “Contemporary Assessment and Cognitive Activity of Senior Students” // – Baku: “Kurikulum, – 2018. №4, – p. 69-74.

17. “A lesson based on today's success” // “Innovation, quality of education and development”, 4th International Scientific and Practical Conference, – Baku: – December 20, 2018.

18. Transition from memory school to thinking school as a requirement of modern times // International Scientific and Practical Conference” Education: classical and modern approaches”, – Baku: – April 4-5, 2019, – p. 223-226.

19. “Use of new learning technologies as one of the main requirements of 21st century Azerbaijani school” “Education: classical and modern approaches”, International scientific-practical conference” // Baku: – Scientific works, – April 4-5, 2019, – p. 79-88.

20. Age characteristics and training activities of senior students // “Modern scientific research congress-IV”, – Istanbul: – December 16 – 18, 2022. – p. 21-26.

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