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THE USE OF MULTIMEDIA TECHNOLOGIES FOR THE DEVELOPMENT OF INTELLECTUAL SKILLS OF STUDENTS

Abstract: *The article reveals the possibilities of interactive tests created using multimedia technologies for the development of students intellectual skills. It also considers the use of interactive methods in the classroom as a factor in increasing students interest in the subject, which leads to increased skills in using information technology, time is saved, and more opportunities are created for consolidating and controlling knowledge. The study identified the main competencies for the use of interactive tests for the development of intellectual skills of students of pedagogical higher educational institutions*

Key words: *Information technology, multimedia technology, intellectual skills, interactive tests, logical thinking, imaginative thinking, multimedia interactive tests.*

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Introduction

At present, modern society places high demands on the intellectual viability of young professionals, regardless of the area in which they are employed. A graduate of a modern university entering an independent life in the conditions of the modern labor market and a rapidly changing information space needs to be a competitive employee.

An important task of the education system is the training of highly qualified specialists in demand on the modern market. In this regard, the urgent problem of training specialists who meet the requirements of the modern world, when students should not only gain professional knowledge, operational skills, but also improve educational and intellectual skills (for example, the ability to think creatively, independently replenish their knowledge in the process of work, improving their skills, quickly adapt to the changing conditions of the modern world, etc.).

The process of the students mental (cognitive) development is, on the one hand, through the assimilation of knowledge, and on the other, through the mastery of mental (intellectual) skills.

However, in working with students more time is devoted to the formation of a specific baggage of knowledge, and the development of mental abilities remains without proper attention.

This is confirmed by studies conducted in different samples, which indicate that intellectual skills are not sufficiently formed not only among schoolchildren but also among university students.

It is proved that the success of mastering intellectual skills does not depend on age, but on the type of training [1].

The use of multimedia tools in the learning process will trigger new forms of logical, mnemonic and creative activity. This can be seen as the historical development of the mental processes of the person.

Education involves enriching students with the intellectual attributes of their culture. Multimedia can be seen as such an intellectual attribute inherent in many cultures. According to L.Vygotsky [2], intelligent tools can facilitate learning in several aspects.

Intellectual skills are manifested in the ability to acquire new knowledge independently, in self-awareness, in the development of appropriate thinking skills and abilities.

Intellectual skills are the ability to work with information and think effectively in modern society. These skills can include:

- the need to use existing knowledge and understand new knowledge.
- the ability to select sources of information for searching new knowledge (encyclopedias, dictionaries, media, and Internet resources).
- be able to find new knowledge (information) from different sources and in different ways (monitoring, reading and listening).
- be able to process the information obtained to obtain the required result (analysis, generalization, classification, comparison, separation of causes and results).
- transfer of information from one form to another (text, tables, graphs, graphs, illustrations) and selection in a convenient format. ability to present information in short or extended form in the process of information processing.

The transition to positive, constructive, scientifically grounded innovation changes in the education system of the republic has led to new problems.

One of these problems is to provide students with advanced technology to develop their intellectual skills.

Doing so will ensure that students can achieve effective results in their future creative, information and educational activities.

Pedagogical conditions for the introduction of multimedia technologies in education can include:

- Creation of a special learning environment aimed at improving the effectiveness of multimedia technologies;
- interactive presentation of educational information aimed at improving the quality of education;
- The use of multimedia technologies aimed at enhancing students' independence and creativity in learning innovation;
- The organization of teacher and student communication on the acquisition of new knowledge through interactive communication with the computer.

According to the famous psychologist O. Tikhomirov [3], in the field of intellectual activity development, the interplay of human, computer and multimedia technologies distinguishes three points:

- replacing;
- filling;
- reorganization.

Reviews literatury

The following have been focused on the development of intellectual skills: G. Gelfman [4], J Piaje [5], D. Shadrikov [6] and others.

Intellectual competence, in my opinion, is that key competency necessary for a future specialist, the mastery of which would allow him to constantly improve himself. According to V.P. Ivanova, "the constant increase of intellectual competence, the growth of individual identity of the mindset provides the formation of a culture of intelligence, a necessary condition for a harmoniously developed personality"[7].

The key basis for the development of professional competencies of a future teacher is his intellectual skills, that is, the ability to carry out various methods of mental activity: to analyze and synthesize, compare, classify and systematize concepts and facts, find a causal relationship, highlight the general, special, individual and other.

According to Olena Martynenko, “The modern pedagogical process requires a fundamental change regarding the teacher’s role in co-operation with the students. He or she would act not only as the bearer of knowledge, but also as the organizer of their cognitive activity. A competent teacher is the main performer in the development of the intellectual potential of the entire nation.

Shifting emphasis on the formation of the subjective competences of pedagogical staff, which will increase the quality of their basic training in general”[8].

Professor Barry Fagin considers in his works the development of critical thinking with the help of computer sciences. According to Barry Fagin, the development of critical thinking determines a persons education. Critical thinking is an important skill for an educated society. Our experience of computer science teachers in an environment with a clear emphasis on critical thinking has prompted us to explore the relationship between them. We describe examples of how critical thinking skills can be developed as part of an informatics curriculum, and suggest future paths where the relationship between critical thinking and computer science is fruitfully explored [9].

Janet G. Donald also addressed the development of intellectual skills in higher education. In her work, Janet G. Donald revealed the phased development of intellectual skills.

Most approaches have, however, paid attention to certain aspects, for example, description or context. In critical thinking, one examines assumptions; in problem solving one lists facts. Exploration, questioning, and goal stating help to establish the general context or parameters in various approaches. All of the approaches refer to intellectual skills at

greater or lesser degrees of generality. Several include different kinds of analysis: of elements; relationships; groups; or structures. Logic or reasoning is referred to frequently as inference, inductive reasoning, deductive logic, or hypothesis formation. The suspension of judgment and impartiality appear to be adjunct skills. One of the most frequently found skills is representation or visualization, where concepts, systems, problems, or procedures are designed, elaborated, restructured or invented. Finally, some process of verification is recommended in the form of seeking evidence or reasons, providing instances or examples, stating qualifications or limits, and using feedback [10].

methodology

Rapid changes in the education system will need to further strengthen the professional training of students in the modeling of the pedagogical process and the formation of the professional competence of future teachers. As a result of applying multimedia technology, which is an effective teaching tool, the student will be able to model the content of the teaching system in his or her future career, effectively and independently solve teaching and methodological issues.

Based on this, as well as our intellectual skills such as analysis, synthesis, generalization, abstraction, and specification on the problem under study, we regard our underlying intellectual skills as part of our research to educate students and enhance their development [11].

This became the basis for active discussion and search for new ways and conditions for developing the intellectual skills of future professionals. Such professionals should not only have general and modern didactics, theoretical and practical skills, and the ability to build different attitudes and relationships to meet new needs of the individual and society in the process, but also to use various innovative technologies, advanced technical and technological expertise, and advanced intellectual skills. Must have the ability to think, professionally oriented multimedia competencies.

In this case, the following are theoretical and practical guidelines for the training process:

- have the skills and knowledge to apply differential psychophysiology in practice;
- creation of information bases, websites, multimedia applications, Web design;
- interest not only in the development of learning material, but also in the development of "intellectual technologies";
- activation of purposeful mental activity; logical, spatial-image thinking aimed at the development and use of multimedia products with a developed complex of intellectual issues;
- development of logical connections;
- formation of the desire for independent learning;
- to master progressive methodologies [12].

In this case, it is advisable to use improvisation and technology. This method can be used to assess the grammar of test tasks. These test tasks force students to think logically to find the right answer or to think intellectually to find the right answer [13].

Control of students knowledge is one of the main elements of assessing the quality of education, an essential component of the pedagogical system and part of the educational process.

Control is one of the most important stages in the learning process. Its proper organization makes it possible to obtain information about the degree of assimilation of material by students, to adjust teaching process.

Testing is a specific system of tasks that helps students determine the level of development of knowledge, skills and abilities [14].

In pedagogy, test tasks have three interconnected tasks: diagnostic, educational and educational.

The diagnostic task is to identify students knowledge, skills and abilities. From the standpoint of objectivity, control of knowledge through testing is superior to other forms of pedagogical control.

The academic task encourages students to become more active in learning the material.

Educational tasks are reflected in the continuity and inevitability of test control. It organizes and directs students' work, helps them overcome their knowledge deficits, and develops a desire to develop their abilities.

Many methodological innovations are associated today with the use of interactive teaching methods and interactive forms of control. “Interactivity” means the ability to interact or be in dialogue mode. Consequently, interactive learning is, first of all, interactive learning [15].

Since the very idea of such training and control arose in the mid-1990s with the advent of the first web browser and the beginning of the development of the Internet, a number of experts interpret this concept as training and control using computer networks and Internet resources.

In terms of vocational education, these forms of control can increase the degree of cognitive activity of students; bring them to the creative level of applying knowledge and skills; increase learning motivation.

Interactive tests increase students interest in learning material. Ready electronic tests are not always appropriate for students in the classroom, program requirements, or training objectives. Therefore, the teacher should be able to create multimedia interactive tests with the use of software to develop students intellectual skills. Students can also be involved in designing tests.

Multimedia interactive tests help to enhance students knowledge in the subject. Students have the opportunity to answer specific questions not only by reading, but by visualizing them. They also learn with great interest the questions presented in audio and video or animation and try to answer them correctly.

This allows multimedia interactive tests to be more effective than traditional tests in enhancing students knowledge. It is possible to develop students intellectual skills by enhancing their knowledge, that is by analyzing, synthesizing, summarizing, abstracting and refining them.

The automated system of student knowledge control includes the following multimedia software: My test, Hot Potatoes, ISpring QuizMaker and others.

Analysis of three of these programs shows that students have more opportunities to develop their intellectual skills in the following programs.

Table 1.

Intellectual Skills	My test	Hot Potatoes	ISpring QuizMaker
Analysis	+	+	+
Synthesis	-	-	+
Summarize	+	+	+
Abstraction	+	-	+
Concrete	-	+	+

As shown in the table above, the ability to develop intellectual skills from these programs by building various tests in the ISpring QuizMaker software is higher than in other programs.

iSpring QuizMaker has the following key features:

- ability to create networked tests (adaptive tests);
- assignments to identify one or more of the correct answers;
- test tasks aimed at filling in understanding;
- open test tasks;
- tasks aimed at identifying similarities;
- compliance tests;
- tasks to identify active areas;
- ability to create tasks to determine the correct sequence.

A window for entering students names and e-mails appears before the test. This information will be used to summarize the results of the student's test results and e-mail.

Of the listed tests, only one correct answer may be created, and tests with more than one correct answer can be created. Adaptation questions as a non-standard test, a test procedure for determining the order, a test for finding an active field. You will need to find a picture to match the answer given in the test below. Here, students learn not only the names of objects, but also their images.

Adaptation tests help students to develop their intellectual skills, that is through these tests students learn to analyze, synthesize, compare, and refine. Adaptation tests may also include tests such as finding a definition or a graphic representation of an object and finding information about it.

There are also tests to find the active areas of the image that are included, so that students have to look for and mark the answer to the question asked.

Examination tests help students to think. Students will need to identify the appropriate procedure for solving the problem they are trying to analyze.

These tests develop students skills in analysis, synthesis, generalization, concretization and abstraction. Through these skills, students can develop intellectual skills that will help them to think logically.

results

Experimental and control groups were selected to carry out the pilot works and determine their effectiveness. Teaching students in the control groups was as usual. In the experimental groups, a lesson on "Multimedia Systems and Technologies" was conducted using the e-learning manual. Lessons from the test and control phase are the same, except for teaching methods.

With the help of the developed test questions at the Tashkent State Pedagogical University named after Nizami were tested for students of the first year of the bachelor degree in 5111000-Professional education (5330400 - Computer graphics and design). A total of 24 students participated in the experiment. Experimental and control groups were selected. Control of students knowledge in the experimental groups was carried out on the basis of multimedia interactive tests, and in the control groups using traditional methods.

In order to compare the learning experiences of the control and control groups, the mean scores on the groups were calculated as $X = \frac{\sum x_i m_j}{N}$. Here xi is the learning rate (price) 2, 3, 4, 5; values. mj - number of repetitions, N - number of students participating in the experiment.

The average value of the effectiveness of the learning process is the arithmetic mean of the scores of the experimental and control groups, that is, the coefficient of effectiveness.

$\eta = \frac{X_E^*}{X_C^*}$ is calculated by the formula.

During the experimental testing, the educational process was monitored for the course “Methods of Teaching Computer Science”. The results obtained during the study are given in table.2.

Table 2.

Groups	**Number of students**		**Level**	**Experimental group**	**Control group**
KGD-102	***Experimental group***	***Control group***			
	12	12	"5" (excellent)	4	2
			“4” (good)	6	5
			“3” (satisfactory)	2	5

On these results, we calculate the average performance.

Mean values in experimental and control groups:

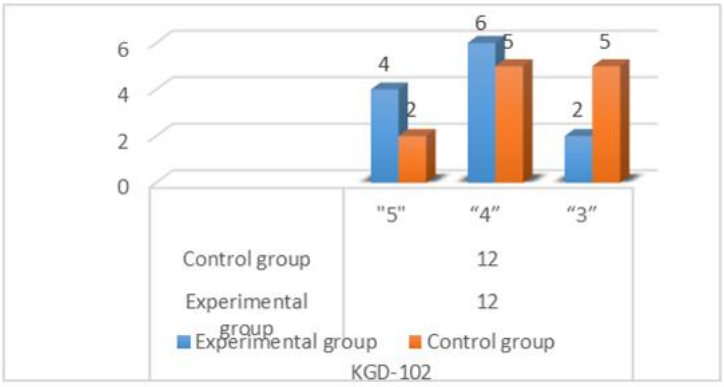
$$\overline{X_E} = \frac{1}{12}[4\cdot 5 + 6\cdot 4 + 2\cdot 3 + 0\cdot 2] = \frac{1}{12}(20+24+6+0) = \frac{50}{12} = 4{,}17$$

$$\overline{X_C} = \frac{1}{12}[2\cdot 5 + 5\cdot 4 + 5\cdot 3 + 0\cdot 2] = \frac{1}{12}(10+20+15+0) = \frac{44}{12} = 3{,}67$$

Efficiency ratio

$$\eta = \frac{4{,}17}{3{,}67} = 1{,}14$$

According to the results of theoretical training, the efficiency of the experimental group is 1.14 times higher.



Picture 1.

The obtained indicators indicate the effectiveness of the development of intellectual skills among students of pedagogical higher educational institutions based on the developed interactive test.

CONCLUSION

Using interactive methods in the classroom increases students' interest in the subject, skills in using information technologies increase, time is saved, more opportunities are created for consolidating and controlling knowledge. Through the introduction of such interactive technologies in the learning process, you can improve the quality of the lesson and achieve accuracy when testing students' knowledge.

The use of interactive tests is aimed at the formation of educational-cognitive, value-semantic, informational and communicative competencies. Conditions are created that allow students to develop the ability to answer the question posed, set goals, make decisions, and formulate the answer. The

competence of personal self-improvement is manifested in the aspect of intellectual self-development, emotional self-regulation, independence and self-esteem. The trainee masters the creative skills of productive activity, masters the methods of action in non-standard situations, heuristic methods for solving problems. Thus, it is undeniable that the use of interactive tests is one of the ways to develop students intellectual skills.

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