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Methodology of Using E-Learning Technology in the Study of the Subject "Computer Science"

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Abstract.

The role of both higher and secondary education at the present stage of development of the Republic of Azerbaijan is mainly measured by the tasks set for it, its transition to a democratic and rule-of-law state, to a market economy, the need to overcome the danger of the country lagging behind the world trends of economic and social development. The main goal of the modernization of education is to create a mechanism for the sustainable development of the education system. To achieve this goal, such important tasks as ensuring State guarantees of accessibility and equal opportunities for obtaining a full-fledged education and achieving a new modern quality of preschool, general and vocational education should be solved as a priority, among others. Within the framework of solving these tasks, the concept of modernization of Russian education at the senior level of general education provides for specialized training and the development of distance education. The model of a general education institution with specialized training at the senior level provides for the possibility of various combinations of academic subjects, which will provide a flexible system of specialized training. This system includes the following types of academic subjects: basic general education, specialized and elective. Elective courses are implemented at the expense of the school component of the curriculum and provide "support" for the study of the main profile subjects, as well as serve for intra-profile specialization of training and the construction of individual educational trajectories. Schools are faced with the task of developing elective courses. On the one hand, solving this problem requires highly qualified specialists, which is extremely difficult to provide, especially in rural areas. On the other hand, today schools, including rural ones, get access to high-speed Internet, therefore, we can say that there is a sufficient technical base for the development of distance learning, which will also solve the problems of specialized training.

Keywords: learning motivation, cognitive interest, learning technology, method, problem situation, intellectual board, computer science.

Introduction

Currently, there are many discussions about the new form of education, which received the

name "distance". Also, this form is often called the «educational system of the XXI century». Previously, the main focus was on the sphere of technology, the development of technical means for improving or optimizing issues related to human activity in various spheres and directions. Of course, this bet remains, because every day new technologies appear, but their novelty, to a greater extent, lies in the modernization of already available technologies. Currently, the main attention is concentrated in the information sphere, the process of working with information and its concentration with the help of technologies, therefore this stage was called "telecommunications". This is the area of communication, information of different types and knowledge. This is the relevance of studying this topic. The so-called "distance learning system" is implemented by means of specified technologies. From the point of view of system, it can respond most adequately and flexibly to the needs of humanity in education and ensure the realization of the constitutional right to education of every citizen of the country. Based on the above, it can be concluded that distance learning can prove itself as the most effective system of training and continuous maintenance of a high qualification level of specialists of various profiles. The formation and modern state of the information society, the development of telecommunication technologies, the processes of technological development occurring in our republic and in the world require the application of various approaches, methods and technologies in the field of education.

The most important aspect of these changes is the development of "Teacher-Student" cooperation, which is the most important and key component of the educational process. As you know, in our modern time there have been changes in the traditional activity of the teacher. Now his position is a guide (facilitator), leading position. The success of education and upbringing of the student largely depends on how this tandem of cooperation will be formed, what forms and methods will be used, and on the basis of which modern technologies it will be built [1].

Today, the desire of many schoolchildren, especially high school students, to continue their education in educational institutions that can provide them with a high level of preparation, the possibility of choosing a professional education, is becoming an urgent problem. It is quite obvious that there was a need to create such an educational environment for schoolchildren, which would allow them to receive a full-fledged education at the proper level and profile, without distracting from their studies. This problem is especially acute for rural schools [2].

The development of electronic education is a possible answer to the questions posed. At the base of electronic learning are pedagogical technologies of learning, independence in self-management of schoolchildren in different educational areas, a combination of various forms and methods of interaction between the teacher and the student [3].

Currently, distance courses that provide diverse and deep knowledge in various subject areas have been created and are being successfully developed on the Internet.

It is possible to say with certainty that in modern conditions electronic learning will be followed by a wide introduction of information and communication technologies in the field of education. Therefore, further development of electronic learning technologies is necessary.

Without worrying about the services of existing e-learning centers, we note that it is necessary to look for new approaches to solving this urgent problem.

The purpose and tasks of research. Theoretically justify and experimentally verify the effectiveness of the method of using electronic learning technology when studying the section of the subject "Informatics and ICT"

Today, informational computer technologies can be considered as a new method of knowledge transfer, corresponding to a qualitatively new content of education and student development. This method allows the student to read with interest, find sources of information, educates freedom and responsibility when acquiring new knowledge, and develops the discipline of intellectual activity.

Robert singles out the following main pedagogical goals of using the means of modern information technologies [4, 5]:

1. Intensification of all levels of the educational process due to the application of modern information technology tools:

- increasing the efficiency and quality of the training process;

- increasing cognitive activity;

- deepening interdisciplinary connections;

- increasing the volume and optimizing the search for necessary information.

1. Development of the student’s personality, preparing the individual for comfortable living in the information society:

- development of different types of thinking;

- development of communication abilities;

- developing skills in making optimal decisions or proposing solutions in a difficult situation;

- aesthetic education using computer graphics and multimedia technologies;

- formation of information culture, ability to process information;

- formation of the ability to carry out experimental research activities.

2. Work performed to fulfill the social order of society:

- training of an information literate person;

- user preparation using computer tools;

- implementation of career guidance work in the field of computer science [6].

The effectiveness of computers and information technologies depends on how we use them, on the methods and forms of application of these technologies.

Let's highlight some ICT models used in teaching:

- Output based on multimedia presentation;

- Computer tests;

- Use of electronic training sets;

- Working with electronic textbooks and encyclopedias.

Considering that modern computers make it possible to integrate text, graphics, sound, animation, video clips, high-quality photographs, and fairly large full-screen videos within one program, we will try to systematize where and how to use information technology in computer science lessons:

1. when presenting new material - visualization of knowledge (demonstration and encyclopedic programs, electronic textbooks, presentations);

2. consolidation of the material (training - various training programs, practical work);

3. control and verification system (testing with assessment, which monitors programs);

4. independent work of students (curricula, electronic textbooks, encyclopedias, searching for information on the Internet);

5. conducting integrated lessons using the project method (creating web pages, using modern Internet technologies);

6. teaching the student specific abilities (attention, memory, thinking, etc.);

7. participation in online knowledge competitions and olympiads.

When working skillfully in computer science lessons, it is impossible to do without an electronic assistant, which can take on a significant part of the work. More specifically, I would like to dwell on the use of information computer technologies in the practice of teaching computer science.

A computer in the classroom significantly expands the possibilities for presenting educational information. This allows students to be more motivated to study. In addition, the use of a computer in the classroom eliminates one of the most important causes of negative attitude towards learning - underachievement. The use of computer technology makes it possible to make a lesson truly productive, make the learning process interesting, implement a differentiated approach to learning, and objectively and timely monitor and summarize results.

At the first stages, information technologies are used to create didactic material. For this purpose, the MS Office software package (Word text editor, Microsoft Excel spreadsheets), technology for scanning and processing text and graphic information, and technology for preparing presentations of educational material using Power Point and Active Studio programs are used.

The computer as a means of passive display of multimedia objects has no fundamental novelty in the didactic aspect. Fundamentally new for the educational field is interactivity, thanks to which students can dynamically manage their content in the process of multimedia analysis of objects.

Among the new interactive tools coming to our school, a special place is occupied by electronic interactive whiteboards - a set of equipment that makes the educational process bright, clear, and dynamic. The classic symbols of school life - the blackboard and chalk - are hopelessly outdated. Using an interactive whiteboard in the classroom is not only an opportunity to interest students in interesting material, but also an opportunity for the teacher himself to reconsider his subject.

When working with an interactive whiteboard in computer science lessons, you can use both traditional and innovative tasks and activities. Some of them are: practical work, frontal work (demonstration of finished material), assignments followed by computer testing, didactic games, public discussion with demonstration of the results of students' independent work, organization of control using previously prepared materials (tests, diagrams) and others.

Using an interactive whiteboard has a number of advantages:

- strengthens the provision of materials that allow teachers to work effectively with various local, network information and software and other resources;

- allows you to increase the perception of the material by increasing the number of illustrative materials;

- allows students to quickly perceive information and increases their motivation;

- allows students to participate in group discussions, making discussions even more interesting;

- allows you to test the knowledge of students throughout the class, makes it possible to organize competent student-teacher feedback.

Very often, distance lessons are used for those students who miss classes due to illness, or for disabled children.

Distance learning cannot be used for teaching some special types of creative activities (playing musical instruments, dancing, singing, painting, etc.), where direct contact between student and teacher is required.

To conduct remote lessons in real time (synchronously), it is convenient to use chat (for group classes). For individual lessons you can use ICQ. When conducting distance lessons asynchronously, using E-mail is effective (you can send documents both from teacher to student and back). The technical implementation of a distance learning system is a rather complex software and hardware complex. Several categories of users work with the software: teachers, schoolchildren, authors of educational courses. For each category of system users, its own user interface must be implemented. The main components of a software product for distance learning are: tool(s) for developing educational content (Authoring tools); learning management system (LMS); system of information exchange between participants in the educational process; educational content delivery system.

System components can interact with external school information systems. The object of interaction can be a school student registration system. The introduction of electronic interactive whiteboards makes it possible to significantly intensify and differentiate the

educational process, conduct classes at a new quality level as part of the development of a competency-based approach in the educational environment. However, it should be noted that to successfully use interactive whiteboards, teachers must have computer skills and master special software.

Using educational programs on a CD is one of the most common ways to use a computer for educational purposes. Electronic textbooks, videos, step-by-step animation, and interactive models are widely used in lessons. They are the most important explanatory tools of the teacher.

Another common form of training using information technology is the creation of tests. These tests are always a hit with students because the question database is extensive so it can be updated easily, while students are always trying to take the "perfect" test (because the teacher doesn't interfere in the scoring process). Of course, tests cannot completely replace the usual control and independent work, but due to the information richness of the educational process, test control (more computer-based) allows: more rational use of study time; cover more information; quick feedback from students and determination of the results of studying the material; ensure simultaneous testing of students' knowledge in the classroom and motivate them to prepare for each lesson.

Also, a more interesting way to use information technology in education is to create game programs that can be used for the same purpose. The use of such programs increases students' interest in the subject, turns learning into an exciting process with game elements, and contributes to the development of students' research skills. The class can be divided into teams and games such as Scrabble can be played.

Today, EE is at a high stage of development, so there are many forms of online training and education on the market. There are such forms as “Fast online learning” (using PowerPoint and Flash technologies), modeling of working with applications, modeling business processes, using animated characters, audio, video, and many other interactive elements of the educational process

Many high schools use the Internet extensively to distribute class materials, communicate between instructors and students, and distribute key training tools.

The original concepts of e-learning have undergone some changes. In the first few years, companies were eager to get existing slides and training materials online as quickly as possible. Today's EE programs are very different from instructor-led learning: they are presented and operated as real-time films, online video games, and fully immersive virtual experiences [5].

E-learning, according to one definition, is learning using computers and computer networks. Unlike distance learning (for example, with sending materials by mail), EE takes advantage of all the advantages of modern desktop PCs: graphics, sound, three-dimensional scenes and animations, virtual simulators, etc. Unlike computer-based training (CBT, computer-based training, when the user works one-on-one with a PC), e-learning involves the use of network opportunities: transfer of learning results to the supervisor, opportunities for collaboration, consultation and discussion, exchange of experience, teacher support, and much more.

It is generally accepted that e-learning is synonymous with such terms as computer-assisted learning, network learning, virtual learning, learning using information and electronic technologies [6].

In modern computer science lessons using computer technology, it is not passive learning of information, but its active processing. Students are of great interest in searching for information on a given topic on the Internet. They complete such individual tasks with pleasure and are ready to willingly talk about it in class. Stories raise many questions and engage others in conversation. Both speakers and listeners win.

The role of a creative computer science teacher is no longer limited to the introduction of existing computer technologies into the educational process. Being at the “front line” of the scientific and technical process, the teacher himself has the opportunity to become a developer and tester of new teaching tools: from describing illustrations to producing a software product for a specific lesson.

The approach in which learning is carried out using information and communication technologies is the most realistic way to ensure positive motivation for learning, forming a sustainable cognitive interest of students, improving the quality of knowledge, creating pedagogical conditions for developing students’ abilities, involving them in independent creative work. activity [5, 6].

Conclusion

In conclusion, it should be noted that the strength of a computer is determined by a person and his knowledge. In the process of studying computer science, they must not only learn to work on a computer, but also be able to purposefully use it to understand and create the world around them. The use of information technology in the educational process, although labor-intensive in all respects, justifies all costs and makes learning more fun, interesting and meaningful. Modern pedagogical technologies in combination with modern information technologies can significantly increase the efficiency of the educational process and solve the problems of education comprehensively

References*:*

1. Petrova, N. S., Petrov, A. Yu., & Chumakova, L. A. (2018). Pedagogika sotrudnichestva kak sovremennaya forma vzaimootnoshenii v vuze. *Problemy sovremennogo pedagogicheskogo obrazovaniya*, (61-3), 180-184. (in Russian).
2. Kafarova, O. K., & Alieva, T. S. (2014). Natsional'nyi kurikulum-dokument, opredelyayushchii osnovnye puti razvitiya sistemy obrazovaniya v Azerbaidzhanskoi respublike. In *Problemy sotsial'no-gumanitarnogo obrazovaniya na sovremennom etape modernizatsii rossiiskoi shkoly,* 240-247. (in Russian).
3. Renkas, A. I., Pridatko, A. V., & Sichevskii, N. I. (2011). Internet-tekhnologii kak sredstvo informatsionno-komunikatsionnogo obespecheniya sovremennogo uchebnogo protsessa. *Educational Technology & Society, 12*(3), 466-472. (in Russian).

4. Gasanova, L. K. (2020). Reformirovanie pedagogicheskogo obrazovaniya v Azerbaidzhane i za rubezhom. *Aktual'ni pitannya gumanitarnikh nauk, 30*(3),300-305 https://doi.org/10.24919/2308-4863.3/30.212525

5. Robert, I. V. (2004). Sovremennye informatsionnye tekhnologii v obrazovanii. Moscow. (in Russian).

6. Robert, I. V. (2006). Raspredelennoe izuchenie informatsionnykh i kommunikatsionnykh tekhnologii v obshcheobrazovatel'nykh predmetakh. I*nformatika i obrazovanie*, (5). (in Russian).