

THE USE OF ELECTRONIC EDUCATIONAL RESOURCES FOR INDIVIDUALIZATION IN THE PROCESS OF TEACHING ALGEBRA IN SCHOOLS

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ABSTRACT

The article discusses the use of electronic educational resources for individualization in the process of teaching algebra in schools. For the concepts of pedagogical science, which reflect particularly complex phenomena, it is often characteristic that they are used in various, sometimes in very uncertain values.

Keywords: Electronic educational resources, individualization, learning algebra in schools.

INTRODUCTION, LITERATURE REVIEW, METHODOLOGY

For the concepts of pedagogical science, which reflect particularly complex phenomena, it is often characteristic that they are used in various, sometimes in very uncertain values. These concepts include "individualization of learning." Analysis of the literature shows that the content of this concept depends on what goals and means are meant when they talk about individualization.

A.A. Kirsanov considers the individualization of educational work as "a system of educational and didactic means corresponding to the goals of the activity and the real cognitive abilities of the collective class, individual students and groups of students, allowing the student to provide educational activities at the level of his potential, taking into account the objectives of learning" [3].

N.V. Kozlov in his work used the concept of "individualization" in the following meaning: "Individualization is learning, in which its methods, techniques and rates are consistent with the child's individual abilities, with the level of development of his abilities; taking into account in the process of learning the individual characteristics of students in all its forms and methods" [4].

Most often, teachers are limited only to additional training sessions with students who have gaps in knowledge, skills, and skills in certain sections of the program. Then, how exactly individualization helps not only to find ways of learning for each student, but also increases the effectiveness of learning in general. This is proved by various experiments conducted on the use of individualization of learning.

I.E. Unt ("Individualization and differentiation of learning") [14] also engaged in the study of the effectiveness of individualization of educational work. The main object of the study was the individualization of educational tasks for independent work of students. The use of individualized independent work contributed to an increase in the efficiency of learning material mastering.

The concept of “individual approach” is also found in the pedagogical literature. An individual approach to the learning process means effective attention to each student of his creative individuality in the conditions of a class-lesson system of training in generally binding curricula and assumes a reasonable combination of front-line, group and individual lessons to improve the quality of training and development of each student.

Based on the definitions of the concepts “individual approach” and “individualization of learning”, it can be concluded that the individual approach is the principle of learning, and the individualization of learning is a special organization of the educational process in a class (group) team that aims to implement this principle.

From all the above, we can distinguish such goals of individualizing the teaching of any school subject, and in particular mathematics: the development and use in teaching of the individual personality traits of the student; development and use in teaching the cognitive interests of each student.

Below are examples of the individualization of teaching mathematics depending on the characteristics of the cognitive interests of schoolchildren: the development and use in teaching of the intellectual abilities and talents of each student; optimal development of learning abilities in each student; preparation for a conscious choice of profession; development of each student's skills in self-study activities.

"In this regard, the teacher of mathematics should study well each of his students in terms of the level of knowledge, learning, effectiveness of interests and abilities" [1].

Consider the international experience of individualization of educational activities of students.

It should be noted that the approaches to individualization of educational activities of students based on the use of electronic learning using distance learning technologies, established in the national school, are in many ways consistent with the approaches implemented in such developed countries as the United Kingdom, USA, Finland and etc.

In 2001, the research program “The Teaching and Learning Research Program” was launched in the UK, aimed at identifying possible areas of individualization of education in schools across the country [7].

In the United States, as in other developed countries, interest in individualized learning is very high. According to the research of the American educational project Tomorrow (Tomorrow), which was attended by hundreds of thousands of primary and secondary school students, more than 52% of respondents said that they like to use information and communication technologies (ICT) in the learning process, as it provides individualized learning: it makes it possible to progress according to their pace and control their learning, supports different levels of development and meets different needs [8].

In Finland, education is now increasingly oriented towards students [5]. Finnish teachers say that the main advantage of their education system is freedom of choice: students choose on their own what subjects to study and at what time. Such freedom of choice causes teachers to have difficulty in “controlling” the progress of students' educational outcomes, as well as doubts that their students make the right choice.

Consider the didactic possibilities of ICT [12], the most significant for the individualization of the educational activities of students in the framework of e-learning. These include: modeling and visualization of information about the studied objects; interactive user interaction and ICT tools; storage of large volumes of information with the possibility of easy access to them; automation of computer processes, information retrieval activities; Automation of the processes of information and methodological support, organizational management of educational activities and control over the results of learning; informational interaction between the participants of the educational process with the help of local and global computer networks.

The most important characteristic of modern electronic educational content is its multimedia content, understood as the synthesis of various types of information - textual, graphic, animation, sound and video, in which various ways of structuring, integrating and presenting it are possible [2, 6]. Multimedia content allows you to go from verbal descriptions to direct audio-visual representations of objects (objects, processes, phenomena).

The second important feature of electronic educational content is its interactivity. Interactive content is electronic content that has the capabilities of establishing various forms of interactive user interaction with its elements [9].

Success in the development and implementation of individualized learning requires equal attention to all components, without which it is impossible: the development of a diverse electronic content, changing methods and forms of educational work, professional development and motivation of teachers to develop and implement with students, their individual curricula, ICT-rich educational environment with the presence of "personal" teaching tools that students can use at home or at school during extracurricular time during - intensive work, and teachers - for the preparation of programs and individualized curricula.

The work on providing the educational process with advanced pedagogical and information technologies is one of the priorities in the second and third stages of the "National Program for Training Personnel" in the Republic of Uzbekistan.

The Decree of the President of the Republic of Uzbekistan dated February 7, 2017 No. UP-4947 "On the Strategy for Action for the Further Development of the Republic of Uzbekistan" identifies priorities for further accelerating the development of the country for 2017–2021. The fourth of the five priority areas in the Strategy of Action is devoted to the **development of the social sphere**. In its fourth "**Development of the sphere of education and science**" the following urgent problems are pointed out: "the continuation of the course of further improving the system of continuing education, increasing the availability of high-quality educational services, and training highly qualified personnel in accordance with the modern needs of the labor market; implementation of targeted measures to strengthen the material and technical base of educational institutions by carrying out work on their construction, reconstruction and overhaul, equipment with modern educational and laboratory equipment, computer equipment, teaching aids; a cardinal improvement in the quality of general secondary education, in-depth study of foreign languages, computer science, other important and sought-after subjects, including mathematics, physics, chemistry, biology;"[13].

RESULTS, DISCUSSION

Today, teaching algebra in general education schools, academic lyceums and vocational colleges, it would be advisable to create and use a variety of electronic educational resources, electronic learning tools that provide visibility and visual support.

Based on this, we have developed an e-learning tool, a multimedia tool, the so-called e-learning complex on the Algebra course for secondary schools (www.edarslik.uz). This, in turn, allows students to acquire more knowledge than a textbook.

This article focuses on the use of electronic educational resources, in particular electronic teaching aids, for teaching topics in the “Square function” section of the algebra course in general education schools.

To use electronic educational resources using the e-learning complex when studying the topic of the subject “Algebra”, you must run the **algebra9.exe** file of the program in the user's folder and the screen will appear.

In this case, there is the **main page** of the e-learning complex, available at the top of the **horizontal - main menu** (sections “**Mundarija**”, “**Dasturlar**”, “**DTS**”, “**Mualliflar**”, “**Mashq**”, “**Yordam**”, “**Chiqish**”) and the menu of the **vertical** - chapters in the lower left corner. Each section contains separate information (all data is displayed at the bottom of the main menu, in a large window). The initial state (vertical menu - list of chapters) is usually displayed when the “**Mundarija**” section is selected from the horizontal row - the main menu. The desired chapter is selected from the chapter menu, and a list of topics to be covered in this chapter appears next to this section. The user can choose from the list of topics in this chapter. To do this, place the cursor over the object, the theme and press the left mouse button once.

From this menu, select the topic “**2-§. $y = x^2$ funksiya**”, as a result, the main window - the page is the full text of the topic. It contains various animations, themed puzzles, images, programs and recorded speech.

The content of this topic is explained by the teacher using the information in the electronic educational resources. These are the basic concepts unfamiliar to the reader, and the basic concepts that they need to know.

This electronic educational resources uses multimedia capabilities, modern information technology, animated images and sounds. To do this, select the “**tasvir**” icon, after which an animated image will appear explaining the square function and the concept of the function $y = x^2$. The student is well assimilated information on the subject through the image on the screen.

It is extremely important to use various channels of perception - hearing, vision, so that any student can understand concepts well. Thus, in the electronic educational resources, the basic concepts of the topic “ **$y = x^2$ funksiya**” are given in a special window with sounds.

Once the topic is completed, you need to select the “**Mashq**” section in the horizontal menu. It offers exercises on this topic to consolidate their knowledge. The teacher can choose several exercises and give the students the task at the end of the lesson.

After completing the topic and doing the exercises, you need to check how the student learned this topic. To assess students' knowledge there is a “test” button at the end of the page. Clicking on it will open a page with tests. You can also select the “Test” section in the horizontal menu. This page has 5 test questions on the topic “ $y = x^2$ funksiya”. Modification of tests (increasing the number or changing questions) depends on the teacher. After completing the test, click the “test natijasini ko’ring” button and see the results.

In the horizontal menu of the upper part of the electronic textbook there is a section “Mundarija”. The next section of “Dasturlar” contains a set of applications (programs) that can be used to solve examples, tasks, and plot some functions.

For example, the equation $y = 3\sin(x) - \cos(x/2)$ is a function and $y = 2$ is a straight line, the problem must be solved. Here two equations are given and the solution is found according to the schedule (Fig. 1).

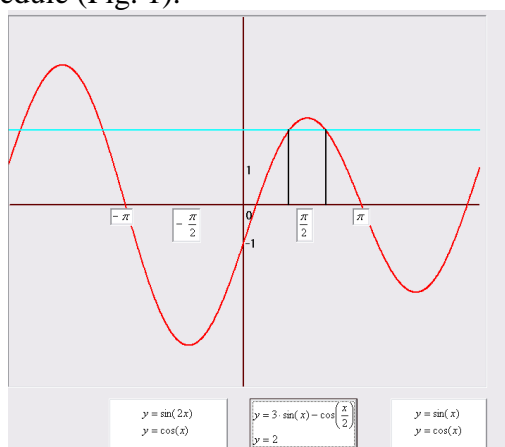


Fig. 1. Type of solution of tasks on schedule

CONCLUSIONS

The peculiarities of students, which should first be considered when individualizing the work, include: the level of mental development of the student, his learning and learning; individual typological features; cognitive interests (against the background of general learning motivation); the speed of passing and understanding of subjects: quickly, slowly.

In this regard, the relevance of the issue of developing scientific and methodological approaches to the individualization of the educational activities of trainees based on the use of e-learning is very high today.

The use of electronic educational resources in mathematics lessons at school expands the capabilities of the teacher in addressing gaps in knowledge among lagging students. As well as teachers can find for themselves many convenient opportunities (tests, animations, multimedia, calendar plans, programs) in the electronic educational complex. This is considered a teaching tool not only for students, but also for teachers. We want to note that the use of electronic educational resources in secondary schools, academic lyceums and vocational colleges develops creativity, thinking, ensures the perception of knowledge, increases students' interest in algebra and provides visibility in the lesson process. And this serves to improve the quality and effectiveness of training.

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