FORMS OF USING BIOLOGICAL ELECTRONIC EDUCATIONAL RESOURCES

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Abstract: The article examines the role of the teacher and student in using modern technical tools, the nature, methodology, and content of the educational process, the use of e-learning resources in lessons, and forms of individualization and activation of the educational process within the framework of collective learning.

Key Words: information technology, cognitive, form, photo, video, dynamic model, virtual, interactive.

When using modern technical tools, the role of the teacher and the student, the quality, methodology, and content of the educational process change significantly. The use of e-learning resources in lessons allows for the individualization and activation of the educational process, even within the framework of collective learning. Conducting lessons using information technologies activates students' mental processes: perception, attention, memory, thinking; the awakening of cognitive interest occurs more actively and faster. Therefore, the purpose of my work is to increase the cognitive activity of students in biology lessons, show interest in the subject, and increase the effectiveness of teaching. This goal includes the fulfillment of the following tasks:

- to help develop cognitive interest, increase learning motivation, and develop creativity
- creating appropriate conditions for learning, utilizing the capabilities of ready-made electronic educational resources (EER) in class and outside of class,
- create and implement their own digital educational resources (the CIA) to meet the needs of students.

Electronic educational resources (EER) include photographs, videos, static and dynamic models, objects of virtual reality and interactive modeling, cartographic materials, sound recordings, symbolic objects and working graphs, text documents, and other educational materials (electronic applications) necessary for organizing the educational process, presented in digital form.

ETR functions for the teacher include: demonstrating digital objects; using interactive models of virtual laboratories and training sets; computer tests; the ability to quickly acquire additional information; and developing the creative potential of students.

ETR functions for students include organizing and conducting individual, research, and creative work in this lesson; assisting in preparing assignments; expanding learning interests;

automatic self-management; assisting in organizing instruction at an appropriate pace and level of mastery of the chosen material; and a large object base for preparing lessons, reports, abstracts, and presentations. Students can use ETR:

1) during the lesson according to the teacher's instructions; 2) extracurricular: projects and exam preparation; 3) at home: preparation for classes, subject olympiads (independently).

At the stage of explaining the new material, I use the following types of learning activities: color drawings and photographs. Slide show. Videos. Animations Interactive models and drawings, diagrams. Media presentations.

At the aggregation stage, I use the following learning activity: work on tasks with choice of answer. Working out with treadmills. Conducting virtual laboratory work.

Presentation - presentations - presentation (English: presentation) is a form of presenting information in visual form using visual-auditory means. The presentation includes computer animation, graphics, video, music, and sound combined into a single resource. Usually, the presentation has a storyline, scenario, and structure so that the information is easily perceived.

Why Presentation Is Effective The last decade has been a period of a worldwide computer revolution. Computers have entered our lives significantly. It is difficult to imagine most areas of human activity without a computer. Business, the fastest-changing dynamic type of activity, did not escape this process. In this case, the question arises as to how to convey your information to others in the most convenient and effective manner to facilitate communication with the computer, attract their attention, and interest. As is known, a person receives most of the information through the organs of sight (80%) and hearing (15%) (this is predetermined and effectively used in film and television). Media technologies help these vital sensory organs work simultaneously. We can attract more people's attention by showing a dynamic visual series (slideshow, animation, video) with sound. Therefore, multimedia technologies allow for the most effective presentation of information. Unlike video, multimedia technologies provide information management, meaning they can be interactive. Multimedia presentation provides direct access to information. The user can view all provided information and access the sections that interest them. Getting information doesn't take much effort and time. Unlike other forms of information presentation, multimedia presentation ensures lower reproduction costs and longer retention time, despite containing tens of thousands of pages of text, thousands of images and visuals, several hours of audio and video recordings, animation, and 3D graphics.[1,2,3]

The electronic textbook is created by a creative team consisting of the developer, designer, methodologist, and author of the textbook based on existing State Standards, curricula and programs, and the approved (approved) textbook.

Unlike the traditional textbook, the electronic textbook contains not only text but also resources such as drawings, graphs, formulas, multimedia, animations, videos, control questions and assignments, games, tests, and puzzles. The electronic textbook has a specific structure that includes functions such as search, quick opening, and repetition of the required information.[5]

Figure 1. Examples of Electronic Textbooks

Electronic textbooks can be used both directly in the educational process and for extracurricular independent study.

Introduction to the content of electronic textbooks.

In recent days, the teacher:

- designer-developer of training courses;
- consultant on teaching methods;
- teacher-specialist in interactive presentation of training courses;
- He needs to be an expert in learning outcomes control methods.

When developing the training course, the following must be taken into account:

-the purpose of the courses;
- ways to reach the goal;
- methods of presenting educational materials;
- teaching methods;
-types of learning tasks;
- questions for discussion;
- discussion and ways to organize the discussion;
-interaction methods and communication

Teachers, while possessing skills in using computer technologies, must implement:

- use the visual capabilities of the computer when explaining new educational materials;
- Organizing classes based on internet, educational, and control software products;
- methodological preparation for the lesson, searching for and systematizing additional information, preparing didactic materials;
- Skills in organizing and managing the educational process based on computer technologies.

Using slides as visual materials in an electronic presentation creates extensive opportunities for the teacher. In the electronic presentation of educational material, presenting material based on animations facilitates students' assimilation of the subject and increases its visibility. Demonstration slides can also be given to students as handouts. Students can react and analyze the slides.

This allows students to acquire the following skills:

-converting graphical information into text format or vice versa;
- formulate conclusions and questions on the topic under discussion;

- plan their own learning and learning activities;

The possibilities of information and communication technologies can be effectively used in the development of personalized education, in the formation of students' creative abilities. [4]

Information technologies are the totality of methods and means of collecting, storing, transmitting, and processing information.

In zoology lessons, sets of information can be used - reference books, encyclopedias, virtual museums, geographical and zoological maps, pictures, drawings, animations, texts, statistical and dynamic expressions of visual information, audio images (written sound, music, etc.).

Zoology teachers must possess the following skills to work with information technology tools:

- create work schedules and technological maps,
- preparation of lesson texts and assignments related to practical exercises,
-create methodological guidelines and control questions,
- analysis of learning outcomes,
- to edit lesson texts,
- Imagine animations of dynamically reflected processes for each subject.

Through electronic textbooks, an opportunity is created to use information and educational technologies in teaching. Furthermore, the effective organization of the educational process through electronic resources ensures the achievement of educational goals. Furthermore, it should be noted that if the educational process is not well-organized, advanced pedagogical and information technologies will also be insufficiently effective. [5]

Games are multimedia applications designed to satisfy the needs of rest and entertainment, reduce the stress of the body, and develop specific skills and abilities. Educational games are programs presented in the form of easy games that help the user develop skills and abilities in a specific field.

Media galleries are collections of motion photos accompanied by sound.

Sound applications - Devices that read sound files - Programs that work with digital sounds. Digital sound is the expression of the amplitude of an electrical signal in discrete numbers. The change of images in frames is the procedure for changing images over a specific period of time.

• Panorama is a wide and close-up view that allows you to freely observe a large open area.

• Interactive Gallery - a gallery that allows the user to control (movement over views).

Video Applications - Technology for Creating and Presenting Motion Images. Video image readers are programs that control video films. It's a short videotape showing the production process, natural phenomena, historical realities, and literary scenes.

Virtual laboratory (simulation) - Designed for demonstration and laboratory work in natural and natural sciences that exist in nature but cannot be demonstrated in practice or are

dangerous. One of the goals of creating virtual laboratories is the comprehensive and complete visualization of the learning process, and one of the main tasks is for the student to fully perceive and understand the essence of the learning process.

Figure 2. Examples of video application for 7th grades

The tasks of the virtual laboratory are: - Visual illustration and proof of the correctness of the studied laws; - Ensuring the absolute safety of conducted experiments and air purity in the classroom; - The possibility of conducting experiments individually, which does not affect the development of students' independence, design abilities, and technical skills; - Performing virtual laboratory work during the lesson eliminates barriers between theoretical and practical lessons, which helps improve the quality and effectiveness of instruction and enhance students' independent cognitive activity; - The virtual information and educational laboratory provides extensive opportunities for conducting research experiments and can be used in specific methodologically justified cases in addition to real laboratory equipment; - The computer lab provides students with subjective experience in non-standard and problem situations. - Implementation of open software products and information technologies into the educational process of the educational institution; - Completion of practical assignments within the framework of seminar classes; - The capabilities of virtual laboratories: no need to purchase expensive laboratory equipment; the possibility of modeling processes that are fundamentally impossible to implement in laboratory conditions; safety; time and resource savings; automatic calculation of laboratory results; the possibility of using virtual laboratories in distance learning; the possibility of performing a series of experiments by changing entered parameters, taking into account that control of the virtual process falls under the responsibility of the computer; observation of the conducted laboratory experiment at different timescales. Furthermore, when studying new areas of knowledge through educational modeling in virtual knowledge and educational laboratory conditions, students' independent activity in knowing the events around them increases, along with the ability to independently find solutions to problems arising throughout their lives and the readiness to apply the acquired knowledge in practice. Therefore, the use of virtual laboratories, which help develop students' independence, is an integral part of success in implementing e-learning computer products. The presentation of assignments in electronic form: using audio, video,

animation, arouses great interest in students. The automatic summation of laboratory work results provides convenience for the teacher. Based on the repeated completion of laboratory tasks by students, the process of developing skills and competencies is accelerated. [6] The creation of a computer simulation model in the form of virtual laboratories is as follows: - lack of a need for specially equipped rooms for virtual laboratories; - observation and demonstration of the internal and external properties of the object through a computer simulation model of the processes occurring in laboratory classes; - virtual demonstration of processes that cannot be carried out in laboratory conditions; - widespread use of virtual laboratories in independent study sessions; - modification of parameters (substances, elements, etc.) provided for in laboratory work; - use as a basis for educational materials for the distance learning type;

- creates opportunities such as increasing the efficiency of the educational process and saving on laboratory work. The use of virtual laboratories in biology lessons creates an opportunity to display biological samples on a computer screen, study the complex interactions of organisms with the external environment, and demonstrate processes such as the constantly changing interactions between living organisms and the growth and development of species. Virtual laboratories are very helpful in showing students the physiological processes in living organisms and describing their structure, behavior, and appearance. At the same time, presenting it on a computer screen increases the level of students' mastery of educational materials. Educational materials that reflect a real image provided using a computer provide students with the opportunity to provide a certain amount of information, as it is much more difficult to fully visualize such images through other educational tools. Below, as an example of using virtual laboratories in the educational process, we try to show a computer simulation model of the laboratory work on monitoring the photosynthesis process from the "Botany" course. This virtual laboratory demonstrates the process of photosynthesis. Students can see the intensity of the photosynthesis process carried out on the basis of a virtual laboratory on a computer and interact with it. This, on the one hand, saves material, raw materials, and similar materials spent on demonstration in educational processes related to laboratory work, while on the other hand, provides the opportunity to directly see, observe, think, exchange ideas, and use laboratory work performed on objects in lessons. Expressing such laboratory work as a virtual laboratory is also very convenient in the distance learning system. The reason is that in schools and educational institutions in remote areas, educational-experimental, practical, and laboratory work can be conducted even in the absence of the necessary tools, equipment, materials, and raw materials for studying curriculum topics. It should be noted that conducting laboratory work in this manner based on a virtual laboratory allows for the saving of a range of instruments and materials. [7]

One of the important tasks of educators is to create a specific desire in students to memorize materials, teaching them ways to remember, think, and develop thinking (observation, comparison, analysis). This task must be implemented, first and foremost, in

secondary schools. Clarifying the teaching subjects of existing zoology courses, further enriching all achievements in this field, summarizing them, proving the connection of theory with practice, introducing modern pedagogical technologies into teaching, and developing teaching methodology for general education schools is one of the urgent tasks facing and necessary for the current methodology and pedagogical sciences. The development of computer technology has made it easy, fast, and inexpensive to solve presentation problems in a variety of subjects, particularly in scientific biological subjects. Currently, electronic textbooks and developments are widely used in lessons. These developments will be in the form of multi-colored animations and multimedia in terms of content, breadth of technical capabilities, software, size, and indicators. Such developments, unlike traditional teaching, significantly help students develop visual recall, as well as the ability to visualize and reflect on changing processes related to the subject. It shapes their yearnings for creativity. At this point, let's touch upon the concept of an electronic textbook [8]. An electronic textbook is one of the fundamental elements of the modern educational process and is a development based on modern information technologies, as a methodological complex encompassing all forms and features of traditional textbooks that ensure the study of a lesson or a specific section. These opportunities are mainly:

- Directly reflects natural, biochemical, physiological, chemical, physical processes;
- To visually represent complex objects and processes;
- Texts based on sound, video, and animation elements;
- The sound-temporal expression of texts and comments;
- Mathematical modeling, calculation of processes, and numerical or graphical representation of results;
- Information Control and Evaluation. When using the electronic textbook in the educational process, it can be enriched, supplemented, and the types of controls can be changed by the teacher. Thus, e-books have a good effect in the following cases:

1. If it has a feature of interactivity (practical provision of feedback);
2. Finding the necessary information quickly;
3. Saving time;
4. The predominance of multimedia technologies in texts;
5. Opportunities to update information, etc.

In general, information should combine situations such as knowledge, pedagogical technology, management, organizational technology, and scientific and visual representation based on analytical abilities. Therefore, electronic textbooks are a multimedia product that provides students with a continuous and uninterrupted learning process. The activities of educators are multifaceted, and they must perform the roles of managers, communicators, directors, regulators, and evaluators. As we know, conducting lessons based on information and communication technologies is yielding very good results today. In particular, if lessons are organized using information technologies in teaching zoology, it ensures that students develop interest in the lesson, independent decision-making, independent thinking, and

reasoning. The educational process is organized based on pedagogical and psychological laws, through various forms and methods in the learning process, and through the application of specific didactic principles. This is because student activity performs cognitive, creative, aesthetic, and communicative tasks based on acquiring knowledge and developing skills and abilities during the educational process. [9]

Figure 3. Examples of multimedia for 7th grades

Multimedia resources *(English multi - "very, extensive," media - "medium")* is a resource related to a specific subject that includes sound, graphics, animation, and movement. Multimedia technology allows for the simultaneous use of multiple methods of information presentation (text, graphics, animation, video, and sound). The most important feature of multimedia technology is interaction - the ability to influence the user in the functioning of the information environment. In recent years, many multimedia software products have been created and are being created: encyclopedias, educational programs, computer presentations, etc. Computer Presentations (Computer-Assisted Presentations) Lectures, reports, or other presentations are often used as visual presentation tools, such as posters, manuals, and laboratory experiments. For this purpose, slide projectors, codoscopes, and slides displaying graphic images on the screen are used. The emergence of the computer and multimedia projector has made it possible to prepare and present visual materials in the form of presentations, which include all the necessary aspects for high-quality editing of the speaker's speech, along with audio, video, and animation.

Training through multimedia programs

Figure 4. Examples of interactive simulators on the topic "Water and Land Animals" for 7th grades

helps to systematize the content components of the material extensively, allowing students to freely choose and undergo full or abbreviated training options. The new format of educational tools creates opportunities not only for the emergence of new opportunities for communication and information transfer, but also for the emergence of new problems, solutions, and new intersection points that occupy a different place in modern culture compared to traditional education and specific mass media. The focus of pedagogical science's experiments and practice on the personality-oriented model of education is largely linked to the development of philosophical views that place the human being at the center of their scientific views. Personal training is training that includes:

• Student-centered and considered the most fundamental value of the educational process;

Figure 5. For 7th grades
"Comparison of the Brain of Common Animals"

examples of interactive simulators

- It contributes to the emergence and formation of the student's personal qualities, the development of their thinking, the upbringing of a creative, active, and enterprising individual, the satisfaction of their educational and spiritual needs; the creation of conditions for the development of their intellect, communicative and social abilities, and skills for self-development and self-improvement;

• it is aimed at meeting society's needs for specialists capable of adapting to new social conditions, acquiring new specialties, and acquiring knowledge independently. [9]

To use these electronic information and educational resources in lessons, we will need computer equipment and other technical tools (video projector, codoscope, interactive "electronic" board, DVD player, TV).

As a result, as a result of the effective use of electronic information and educational resources in the educational process, it becomes possible for the student to assimilate the educational material quickly and easily, that is, through sight and hearing, more deeply and perfectly.

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