

Scientific And Methodical Bases Of The Use Of Electronic Educational Resources In Teaching Biology In General Educational Schools

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Abstract

The use of multimedia materials makes it possible to present educational material as a system of bright reference images filled with exhaustive structured information in an algorithmic order. These materials can be used in biology classes, using a computer and projector, as well as to improve the quality of education using electronic education in biology education.

Key words: *media, media resources, information technology, biology, the educational process, media materials, the Internet, ICT, innovative methods, pedagogy, students*

1. Introduction

Modern approaches to the learning process, the fundamental reform carried out today in the teaching of all subjects, are inextricably linked with the use of modern innovations and interactive tools in the educational process, the professional competence of teachers, the intellectual potential of students.

The main requirement that society puts forward to the educational process is the need to connect learning and life in a market economy and prepare students for effective activities. The results of education should not be evaluated by indicators of the success of mastering knowledge, but by the degree of preparedness of a person for successful and independent activities outside the education system and recorded in the form of a certain set of competencies and competencies.

The introduction of a competency-based approach is an important condition for improving the quality of education. The essence of the competency-based approach in teaching is not to increase the student's awareness in various subject areas, but to help him learn to solve problems independently in new and unexpected situations. A competency-based approach enhances the practical orientation of education, emphasizes the need to gain experience, the ability to put knowledge into practice. Competence is formed in the course of a variety of cognitive, communicative, practical, creative activities of students.

The above goals and objectives require the creation of a modern computerized educational environment that provides for the targeted use, along with educational and methodological complexes, of electronic resources aimed at the formation of basic and subject competencies in biology for students developing the development of skills in using information technologies.

General requirements for the development of a new generation of educational and methodological complexes in general subjects are reflected in the State educational standards for general secondary and secondary specialized, vocational education.

Visual aids that serve to increase the effectiveness of teaching scientific disciplines are created on the basis of specific practical programs. Teachers are required to prepare such software tools and to possess

the competencies of their implementation, in this issue there is a need to attract programmers directly. In many cases, electronic tools are created that combine scientific sources on an integration basis in two scientific disciplines.

If each student is able to independently use a computer, then opportunities are expanding to introduce him to the world of inventions and research. Modern education mainly relies on training programs, visual presentation techniques, and computing operations using computers and mobile devices.

In any study, it is impossible to do without electronic educational resources, electronic tools and technologies for their use, therefore, an informative learning environment is considered as an effective scientific and practical tool.

The use of high-quality electronic tools and the correct connection to the educational process create optimal conditions for students to receive the necessary information, process it, master basic and subject competencies, control them, develop creative abilities, introduce additions and changes to the educational process, and constantly check educational results. In addition, opportunities are created for diagnosing and predicting student activities, developing recommendations for designing future lessons, determining the order of educational and cognitive activities of students aimed at consolidating certain information.

Efficiency in biology classes in most cases is achieved due to the observance of didactic laws and the targeted introduction of scientifically based forms, methods and techniques into the educational process. Students are introduced to the animal world, their way of life, reproduction and development through the receipt of scientific information from a textbook and teaching aids.

The teaching of biology at school requires the visualization of training, since the structure of living organisms and the physiological processes that occur in them cause difficulties for perception without visualization.

The activation of the educational process is carried out on the basis of innovative approaches in the education system, through the use of modern technologies and programmed teaching aids, tests and other non-traditional teaching aids. Electronic learning tools also help students become more active in many subjects.

The use of electronic tools in biology classes is associated with new methods for their implementation. The use of electronic educational resources in biology is associated with the fulfillment of certain conditions:

the visibility and variety of the information provided (color illustrations, audio-video recordings, animation and other types); implementation of feedback (a system of tests to determine the degree of assimilation, providing quick control); training in self-control skills in order to actively and accelerate the assimilation of training materials; the constant "maintenance" of teaching aids and the enrichment of new information, that is, the purpose of electronic teaching aids is to synthesize the main educational material with additional new information with the prospect of its possible use in the future.

Electronic resources can be used both frontally on the big screen, and individually for each, if the preparedness of students and the material equipment of the office allow. Each student, working individually, chooses his own pace of work for mastering the material and level.

The use of electronic educational resources in biology education also provides the solution to educational problems. With the help of electronic educational resources, the effectiveness of assimilation of educational material in biology, the development and consolidation of vital skills, is achieved:

1) provides visibility and accessibility of the presentation of the most difficult topics and concepts, for example, familiarization with external and internal processes taking place in the animal's body, it becomes possible to visually observe and track them (through a monitor); 2) specific methods of studying the structure and location of organs in animal organisms are organized; 3) the use of CD and DVD prefixes with the showing of short science-fiction films directly related to the animal habitat, helps students to formulate concepts about the animal's lifestyle, distribution area, animal species, interaction and relationship with nature; 4) the integration of electronic resources in the educational process contributes to the development of self-knowledge acquisition skills.

Based on the results of the study, a didactic model of the effective use of electronic educational resources and its introduction into the educational process was created (Fig. 1).

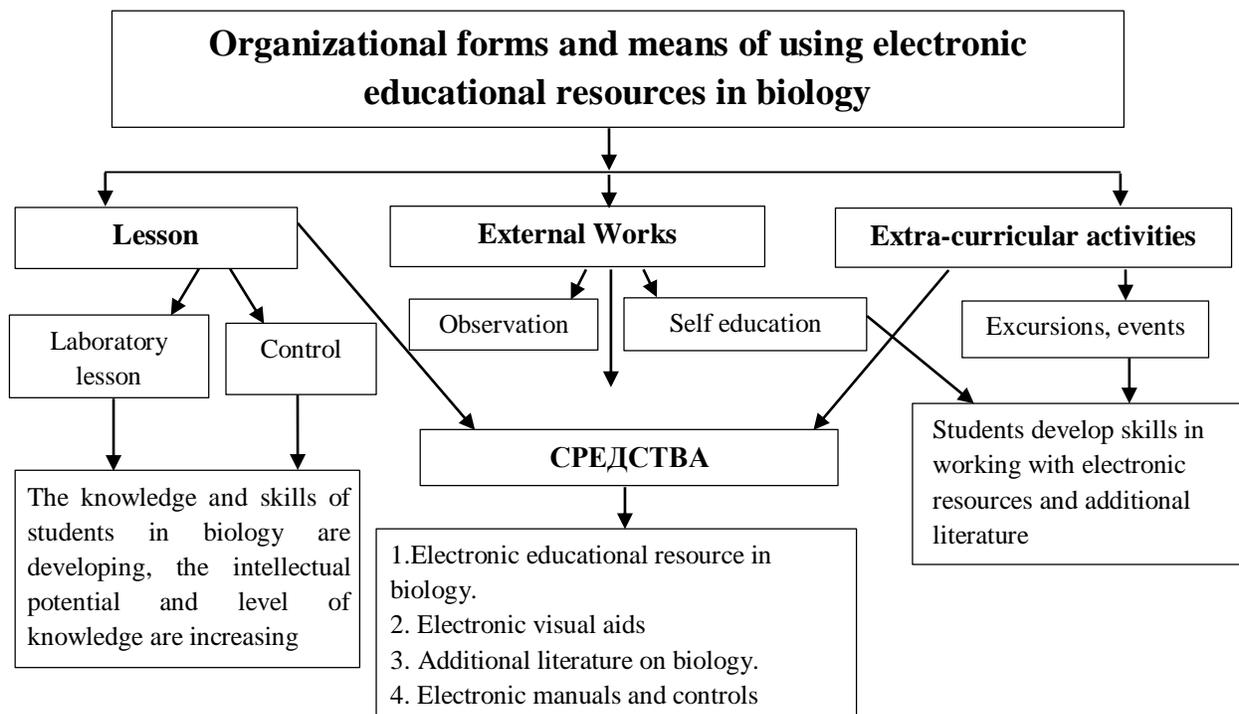


Fig. 1. Model for the use of electronic educational resources in biology

Prepared electronic educational resources were introduced into the educational process in biology in secondary schools. Particular attention was paid to the choice of topics, taking into account the competency-based approach and focusing on international standards in assessing the quality of education.

The level of development of students' knowledge and skills within the framework of the topic studied depends on how the quality and quantity of visual aids meets the requirements and objectives of teaching biology at a particular stage. Thanks to electronic resources, it is possible to present a color image of animals, their external and internal structure, functioning systems, the diversity of species of the animal world, and more.

When choosing the elements of the didactic system used in teaching technology, it is necessary to take into account the nature and orientation of the educational and cognitive activities of students. Practice shows that, as a rule, 7-8 minutes of the lesson are allotted to the theoretical part, then discussion follows, work in small groups is organized in order to consolidate knowledge. In the first 7-8 minutes, the highest efficiency of assimilation is observed, then the motivation for cognition weakens (over the next 15

minutes). There is a need to keep the attention of students for as long as possible.

The main difference between this program and the main ones is that it incorporates a set of materials in a multimedia format on all topics of the section - on morphological and physiological processes in the animal organism, presented in a series of animations, videos, drawings, and infographic information.

The textbook “Biology”, “Red Book” of Uzbekistan in PDF format has been placed in the educational resource for independent study, while biology lessons are supplemented with interesting information about classes of animals or individual animals in the unit for biology classes in class 7, “World of Amazing Animals”. These materials can be accessed when organizing extracurricular biology classes

It should be recognized that the created program aimed at increasing the effectiveness of biology lessons is not without some shortcomings. Along with the widespread introduction of technological elements in the modern educational process, one must also remember innovative methods of increasing the effectiveness of biological education.

As for extracurricular and extracurricular work in biology, its main content is the presentation of additional information about the morphological and anatomical structure of animals, the functioning of life support systems. Extracurricular activities are aimed at consolidating theoretical knowledge and practical skills.

In the process of extracurricular activities, it is advisable to organize short-term observations of the development of animals at different stages of their life. For example, the breeding season (by observing the fish in the aquarium, or the moment the egg is opened and the chicken or chick canary is born, the development and growth of the kitten or puppy).

Students using living examples can follow the behavior and development of animals in different periods, such observations will help to form a sense of love for nature among schoolchildren and a desire to protect and protect the animal and plant world. Electronic educational resources are an effective means of innovation, helping to enrich students' theoretical knowledge and practical skills, and form research skills in them.

In order to prepare students for the international system of assessing knowledge in educational institutions of the secondary education system, one should focus on the parameters of the PISA, TIMSS systems, where it is proposed to use a complex of computerized test tasks in several educational subjects. In this regard, there is a need to develop a didactic system for the use of computerized non-standard biology tests for lessons, extracurricular and extracurricular activities.

We have prepared blocks of non-standard tasks. The tasks are designed in such a way that they maximally develop the critical thinking of students from the basic to a more complex level, including: 1) analysis: compare, solve a problem, research, classify; 2) synthesis: choose, evaluate, comment, express your opinion, sort, arrange by rank and degree; 3) assessment: create, invent, compose, develop. The program proved that the use of non-standard tasks in comparison with standard tasks has multiple correct answers, extensive knowledge and abilities of students, as well as the study of the morphology and physiological process of the body. Mostly these tests are designed for students to self-assess. Working with custom tests requires some explanation. Non-standard tasks contribute to the development of logical thinking, oral and written speech, which will lead to a higher quality of knowledge.

The didactic system of students' knowledge control allows applying phased integrated control, which provides verification of the formation of knowledge and ability to solve biological tasks throughout the entire training period, and at the final stage (see Fig. 2).

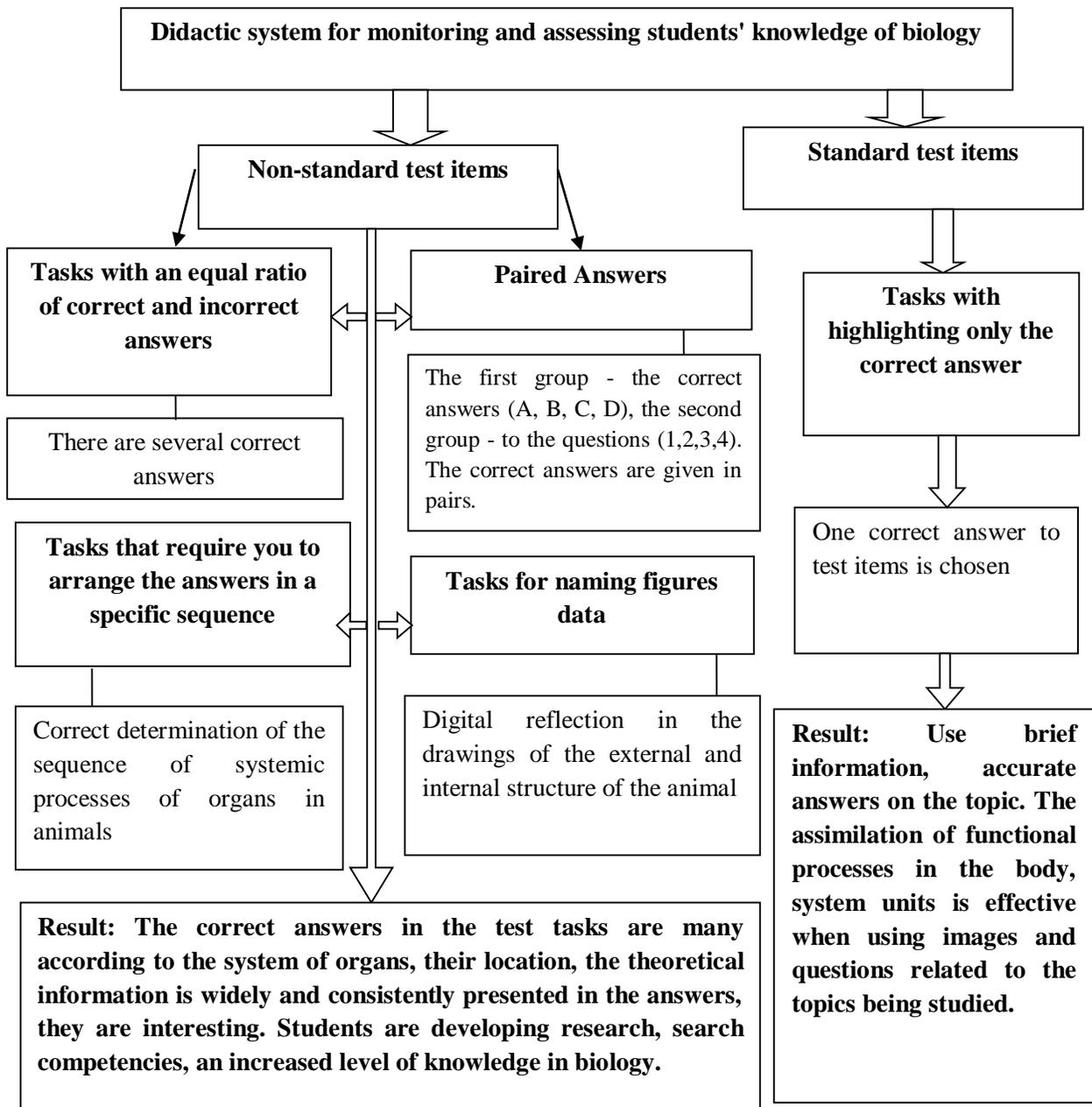


Fig. 2. The didactic system for monitoring and evaluating students' knowledge of biology

Using computer tests allows you to quickly and easily control students' knowledge of the topic studied in the lesson, evaluate students and free up teacher time, at the end of testing, the results are summarized and the student sees the percentage of test completion and accordingly evaluates the degree of knowledge acquisition on this topic.

The main directions of increasing the effectiveness of biology lessons through the use of electronic educational resources are identified, which allows us to draw the following conclusions.

2. Conclusion

1. The use of electronic educational resources, visual materials, contribute to the perception of educational material to enhance the educational and cognitive activities of students, the formation

of their basic and subject competencies related to the content of biological education, is important to improve the effectiveness of biology lessons.

2. The didactic model and methodological system developed on the basis of the results of the study and introduced into the educational process in biology provide an opportunity to demonstrate systematic training material that allows students to conduct direct observations of complex digestible biological processes inaccessible to human vision, using electronic learning resources.
3. Based on the didactic requirements, e-learning resources have been developed on the subject “Biology” for secondary schools for classes, extracurricular and extracurricular activities that contribute to the development of students' knowledge and skills.
4. The results of the experiment convince that the improvement of the system of effective use of electronic educational resources in biology education and their widespread introduction contribute to the successful manifestation of students' independent activities.

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