

## USE OF ELECTRONIC INFORMATION EDUCATIONAL RESOURCES IN IMPROVING THE EFFICIENCY OF BIOLOGICAL SCIENCE TEACHING

Saparov Kalandar Abdullayevich

Tashkent named after Nizami State Pedagogical University

Department of "Zoology and Anatomy". Professor, Doctor of Biological Sciences

Sanayeva Munisa Ilamonovna

Tashkent State in the name of Nizomi

Researcher of Pedagogical University

### Abstract

This article describes the rapid development of information systems and telecommunication technologies in the developed countries of the world, the reforms being carried out in this regard in our republic, and the issues of using electronic information and educational resources in biology education. Opinions on the role and importance of electronic information educational resources in ensuring educational effectiveness are also presented.

**Keywords:** educational process, information system, biology education, electronic information educational resources, modern innovative technologies, perception and knowledge process, educational efficiency, information sources, interactive education.

### Introduction

The rapid development of information systems and telecommunication technologies in the developed countries of the world expands the possibilities of using electronic information and educational resources and has a positive effect on the increase in the quality and efficiency of education. Human civilization's step into the information society is teaching people to carry out professional activities in the modern automated information environment and to protect themselves in this environment. It should be noted that informatization, as well as information and communication technologies, are considered as one of the main directions of modernization of the education system today. This situation is not limited to the rapid development of techniques and technologies, but is characterized by the need to achieve a serious increase in the potential of working with information, which is becoming the main value due to fundamental changes related to the development of the information society.

In our republic, a number of reforms are being carried out on the issues of further improvement of the education system and the introduction of modern innovative technologies. In particular, in the Resolution of the President of the Republic of Uzbekistan dated February 27, 2020 "On measures to further develop the field of pedagogical education" No. PQ-4623 [1] education and training methods, information and communication technologies and foreign languages, training professional pedagogues with the skills of using modern pedagogical technologies in the educational

process, ensuring the harmony of education, science and production in the field improvement, training of competitive personnel, effective organization of scientific and innovative activities is defined as one of the priorities of the development of the field of pedagogy.

Also, in the fourth priority direction of the Development Strategy of the New Uzbekistan for 2022-2026 of the President of the Republic of Uzbekistan called "Fair social policy management, development of human capital", improving the quality of education in schools, knowledge of pedagogues and personnel and the task of bringing the qualification to the international level [2]. In the decision of the Cabinet of Ministers of the Republic of Uzbekistan No. 187 of April 6, 2017, "increasing the quality of education by widely introducing modern and innovative pedagogical methods of teaching and information and communication technologies into the educational process; priority tasks such as "creating conditions for students to receive high-level education, to form and develop their creative abilities" [3].

In this regard, it is important to further improve the didactic principles of using electronic information educational resources in biology education of secondary schools. The introduction of the most advanced electronic information and educational resources into the educational processes organized in general education schools operating in our country is one of the urgent issues. In particular, electronic information educational resources are of great importance in increasing the effectiveness of teaching biology, in increasing the biological competence and knowledge potential of students, and in ensuring their humanistic attitude to nature [4].

According to the results of the analysis, it was found that there are a number of problems in the creation and use of electronic resources in the biology education of secondary schools of our republic. One of the main reasons for these problems is the insufficient level of scientific-methodical knowledge and qualification of science teachers in using electronic information educational resources, as well as the insufficient scientific-methodological support of teaching biology.

The effective use of electronic information educational resources in biology classes has a positive effect on students' thorough assimilation of biological knowledge, and also increases the effectiveness of the educational process. In this process, it is necessary to pay attention to the following:

- presentation of studied educational information in the form of animation, audio and video;
- creating a creative environment for the interactive cooperation of the teacher and students during the learning process, in which students become a full participant in the process of perception and knowledge;
- the ability to work independently with various external information sources;
- continuous monitoring and evaluation of knowledge and skills acquired by students in the educational process through online testing systems [5].

Didactic requirements for creating and using electronic information educational resources and methodological requirements are closely related. Methodological

requirements for educational electronic publications and resources, specific features of a specific subject, focused on the development and use of information technology tools for computer technologies, the characteristics of the relevant subject, the composition of its conceptual apparatus, the methods of studying its laws, modern requires taking into account the possibilities of introducing information processing technologies [6]. Therefore, electronic information educational resources related to biological science should meet the following methodological requirements:

1. The diversity of real technical systems and devices, in connection with the complexity of working with them, should be based on the interdependence and influence of conceptual, figurative and effective components of students' thinking ability.
2. Electronic information and educational resources for biology education should ensure the reflection of the system of scientific concepts in the field of education in a multi-level hierarchical form, each of which corresponds to the level of abstraction within a certain discipline, and also one of these concepts it is necessary to ensure that the level logical relations are taken into account.
3. In order to gradually increase the interdisciplinary level of abstraction of students' knowledge at the level of assimilation of electronic learning resources, which is sufficient for students to perform algorithmic, heuristic activities, provide students with various supervised training sessions. to create the possibility of transfer [7, 8].

The use of electronic information educational resources in biology classes is a modern teaching tool for more effective organization of the educational process. In addition, it creates an opportunity for students to get acquainted with new concepts in a more precise form, to get information about objects with the help of various videos and photos, and to combine the presented material in interesting ways [9]. All this significantly increases students' interest in learning. Also, in the classroom, the teacher manages to control the activity of each student, to attract his attention, a calm, friendly and mutual support environment in the classroom allows for successful completion of tasks. For this purpose, it is recommended to use the following e-learning tools:

- 1) electronic textbooks and manuals;
- 2) interactive boards;
- 3) electronic encyclopedias and reference books;
- 4) simulators and test programs;
- 5) educational resources of the Internet;
- 6) video and audio equipment;

The main forms of using these tools are:

- 1) direct use in the course of the lesson;
- 2) use in the organization of extracurricular educational activities.

When using the above-mentioned information technology tools, depending on the goals and tasks of the lesson, they can be used in the following cases:

- 1) learning new material;
- 2) systematization of knowledge;
- 3) performing practical tasks;

4) control of knowledge and skills.

According to the researchers, one of the important tasks in biology education is to develop students' practical knowledge, skills and competences related to the use of modern information technology tools, as well as the ability to independently acquire new knowledge, and to teach them how to organize their labor activities on a scientific basis in the future.

In the application of electronic information educational resources to the biology education process, specific didactic requirements are set for educational information. One of these requirements is the requirement of flexibility. This means adaptation to the individual capabilities of the student. Adaptive demand is the adaptation of the student's knowledge, skills and abilities, as well as psychological characteristics, in the organization of the biology educational process using electronic educational resources [10].

It is recommended to distinguish three levels of adaptation in the use of electronic information educational resources. The first level of adaptation is the ability of students to choose an individual pace that suits their learning. The second level of adaptation includes determining the situation of the student, as a result, its content and teaching methodology are proposed.

The third level of adaptation is based on an open approach that does not mean classifying potential users, that is, it is based on the desire to develop as many options as possible for its use in the largest contingent of students [11].

According to the majority of pedagogical scientists, lessons using electronic information educational resources are rich in information, visual, interactive, efficient use of time, learning at the own pace of each student, And the teacher has the opportunity to carry out differentiated and individualized education with students, as well as creates a basis for monitoring and evaluating the results in teaching [12].

The requirement of interactive education means that the student should interact with electronic information and educational resources during the learning process. Electronic information and educational resources should provide dialogue and exchange of ideas. An important component of the organization of communication is the mandatory response of electronic educational resources to the actions of the teacher and students. Feedback tools monitor and correct the student's behavior, provide recommendations for further work, clarify information and provide continuous information. It provides the results of case analysis with recommendations for improving the level of knowledge of communication tools during monitoring to diagnose errors and deficiencies based on study results.

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