Digital Educational Resources and its Importance in Teaching

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ABSTRACT

This article provides information on digital learning resources. It also provides an overview of the requirements for digital learning resources, their types and their importance in the learning process.

Key words: *digital educational resources, dynamic models, interactive modeling, virtual gallery, lesson, learning, demo graphics, Teacher materials.*

I. Introduction

Digital educational resources are photographs, video clips, static and dynamic models, objects of virtual reality and interactive modeling, cartographic materials, sound recordings, symbolic objects and business graphics, text documents and other educational materials necessary for organizing the educational process.

II. Main Part

General requirements for digital educational resources:

Modern Digital educational resources should:

- ¦ focus on modern forms of education, provide high interactivity and multimedia education;
- ¦ ensure the possibility of level differentiation and individualization of teaching, take into account the age characteristics of students and the corresponding differences in cultural experience;
- ¦ propose types of educational activities that orient the student towards gaining experience in solving life problems based on knowledge and skills in this subject;
- ¦ ensure the use of both independent and group work;
- ¦ contain options for educational planning, assuming a modular structure;
- ¦ be based on reliable materials;
- ¦ to exceed the volume of the corresponding sections of the textbook, without expanding, at the same time, the thematic sections;
- ¦ fully reproduced on the declared technical platforms;
- ¦ provide an opportunity to use other programs in parallel with digital educational resources;

- ¦ provide, where it is methodologically appropriate, individual adjustment and preservation of intermediate results of work;
- ¦ have, where necessary, built-in contextual help;
- ¦ have a user-friendly interface.

Tasks of the digital educational resource kit:

The main objectives of the digital educational resource kit are:

➢ helping the teacher prepare for the lesson:

- layout and modeling of a lesson from separate digital objects;
- a large amount of additional and reference information - to deepen knowledge about the subject;
- effective search for information in a set of digital educational resources;
- preparation of control and independent work (possibly by options);
- preparation of creative assignments;
- preparation of lesson plans related to digital objects;
- exchange of results of activity with other teachers via the Internet and portable external memory.

➢ help with the lesson:

- demonstration of prepared digital objects through a multimedia projector;
- use of virtual laboratories and interactive recruitment models in frontal laboratory work mode;
- computer testing of students and assistance in assessing knowledge;
- individual research and creative work of students with digital educational resources in the classroom;

➢ helping the student with homework:

- increasing students' interest in the subject due to a new form of material presentation;
- automated self-control of students at any convenient time;
- a large database of objects for the preparation of speeches, reports, abstracts, presentations, etc .;
- the ability to quickly obtain additional information of an encyclopedic nature;
- development of the creative potential of students in the subject virtual environment;
- assistance to the student in organizing the study of the subject at a pace convenient for him and at the level of assimilation of the material chosen by him, depending on his individual characteristics of perception;
- familiarizing schoolchildren with modern information technologies, the formation of the need to master information technology and constant work with them.

Contents of the digital educational resource kit:

❖ Block for obtaining information: popular science articles, texts of primary sources, textbook fragments (everywhere - with the ability to search in the text), illustrations, animations and other multimedia components, multimedia lessons-presentations.

❖ Virtual gallery: video clips, animations, realistic and synthesized images, sound objects.

❖ Virtual laboratory: interactive models, interactive animations, virtual laboratory;

❖ Reference materials: graphs and diagrams, biographies of scientists, Internet links with annotations.

❖ Dictionary of terms, definitions, laws.

❖ Certification: sets of questions and tasks, tasks for research activities.

Types of digital educational resources

The set of digital educational resources includes the following blocks:

- ✓ interactive components - questions and tasks, control and independent work, interactive models and animations;
- ✓ demo graphics - illustrations, animations, video clips;
- ✓ texts - paragraphs of text, texts with sound, biographies of scientists, tables;
- ✓ Teacher materials - presentations and lessons.
- ✓ Interactive components

Control assignments and self-examination questions are interactive components that allow you to test the student's knowledge. The set of digital educational resources for the textbook includes six types of tasks:

- choice of one answer from several;
- choice of several answer options;
- entering a word or phrase;
- indication of the desired object in the picture (point - n - click);
- dragging and dropping objects and overlapping them (drag - n - drop);
- combined answer (several different types in one problem).

In most types of problems, the computer automatically checks the answer. If the answer is incorrect, a hint comment can be provided and the student can try again to answer the question. The hint text depends on the student's answer.

Control tasks and tasks for self-examination can be used at different stages of the educational process to control and self-control of students in the process of studying the topics of the course, to provide feedback. Here are some examples of using digital educational resources with assignments:

- while explaining the new material, solving the problem and discussing the correct and incorrect approaches to the solution;
- consolidation of educational material: performance of 2 - 3 tasks in 5 - 10 minutes;
- homework or independent completion of tasks by students in the classroom of the teacher's choice;
- preparation for thematic control.

Control, independent work and tests are a selected sequence of 5-10 questions and tasks of various types on the topics of a set of digital educational resources. The student can answer questions sequentially or "jump" from task to task. In a special window, the number of completed tasks and the number of correct answers (estimate as a percentage of the maximum score for this work) are noted. These interactive components allow students to organize self-certification, that is, to test their knowledge without the participation of a teacher.

Interactive models

The use of interactive models significantly speeds up the process of explaining the educational material and increases its quality, especially in classes at the basic level, where there is a shortage of study time and schoolchildren are characterized by a "humanitarian-visual" perception of the content of biological education. The images of phenomena that are formed with the help of models and animations are remembered for a long time.

Computer models easily fit into the lesson and allow the teacher to organize new non-traditional types of student learning activities. As an example, we will give three types of lessons using computer models.

Lesson in problem solving with subsequent computer verification

The teacher offers students, for independent solution in the classroom or as homework, individual tasks, the correctness of the solution of which they can check by setting up computer experiments. Self-verification of the results obtained with the help of a computer experiment enhances the cognitive interest of students, makes their work creative, and in some cases brings it closer in character to scientific research. As a result, many students begin to invent their own problems, solve them, and then check the correctness of their reasoning using computer models. The teacher can deliberately encourage students to such activities, without fear that he will have to solve a "heap" of problems invented by the students, which is usually not enough time. Moreover, the tasks compiled by students can be used in class work or offered to other students for independent study in the form of homework.

Lesson-research

Students are encouraged to independently conduct a small study using a computer model and get the necessary results. Moreover, many models allow such a study to be carried out in just a few minutes. Of course, the teacher formulates research topics and also assists students in the planning and experimentation phases.

Lesson - computer laboratory work

To conduct such a lesson, it is necessary, first of all, to develop appropriate handouts, that is, forms for laboratory work. Tasks in the work forms should be arranged as their complexity increases. At first it makes sense to offer simple introductory tasks and experimental problems, then computational problems and, finally, tasks of a creative and research nature. When answering a question or solving a problem, the student can set up the necessary computer experiment and check his ideas. Students are recommended to first solve the design problems in the traditional way on paper, and then put on a computer experiment to check the correctness of the answer.

Note that tasks of a creative and research nature significantly increase students' interest in studying biology and are an additional motivating factor. For this reason, the lessons of the last two types are especially effective, since students gain knowledge in the process of independent creative work. After all, they need this knowledge to obtain a specific result visible on a computer screen. The teacher in such conditions is only an assistant in the creative process of knowledge formation.

Demo graphics

In the set of digital educational resources, demo graphics are presented with diagrams, graphs, drawings and photographs, portraits of scientists. Graphic objects are not just analogs of traditional illustrations of textbooks, they supplement, didactically enrich the material, form correct ideas about the objects under study.

Texts

"Texts" are illustrated texts in digital form, intended primarily for repetition of textbook material. The electronic form greatly facilitates the search for information in the text. These are brief summaries of the textbook, the formulation of laws, biographies of scientists. Text objects can be organically incorporated into all forms and methods of teaching and used at different stages of the educational process by both teachers and students.

III. Conclusion

Texts with audio commentary can be effective for home review of lesson material by students. They can also be used as components of lectures and presentations while explaining new material. Texts with audio commentary can be useful for children with physical disabilities.

A teacher presentation can be used as a form of lecturing. An effective presentation of the presentation is accompanied by explanations, comments of the teacher: he can pause the presentation of "slides", dwell on important material in more detail, not show all "slides" at once, etc. This form of conducting a lesson-lecture is more effective, as it makes it possible to interest students in the topic, intrigue, make them think, teaches them to draw conclusions.

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