METHODS OF DEVELOPING EDUCATIONAL ELECTRONIC RESOURCES

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Abstract

The article provides analytical information on the importance and role of creating and using modern electronic educational resources in the educational process, including electronic textbooks and manuals, electronic lecture texts and Recommendations and solutions are given in the form of presentations, virtual computer models of laboratory work, electronic comments on inspection results, computer tests, etc.

Keywords: Electronic textbook, distance education technologies, electronic educational resources, local electronic publication, information communication technologies, multimedia.

INTRODUCTION

This article analyzes possible methods for creating educational electronic resources in the educational process in a higher educational institution.

Electronic educational resources (EER) are a very important learning tool when studying a large number of subjects in higher education. They play one of the main roles in the training courses for specialists.

The structure of an electronic educational resource is the most important aspect. In building the structure of any educational resource, the main thing is to establish relationships between them and highlight its components. An electronic educational resource is also considered as an interactive software and holistic learning system [9]. In this case, it is advisable to conduct a study of the structure of the electronic textbook from different points of view: assessment of the content of educational material, reflection of didactic and methodological functions, and from the standpoint of implementation. Many researchers consider the reflection of the content of the course in a traditional textbook, as well as the function of such a textbook.

To study the structure of a textbook, it is imperative to find out its more important components and analyze them as part of the meta structure. The system of teaching aids is such a meta-structure. The role of electronic educational resources as the core of learning tools is not only preserved, this resource is also able to replace collections of reference literature, exercises and tasks, visual aids, manuals for independent work, and even imitate natural objects. Along with this, an electronic educational resource implements such a function as managing the process of presenting educational material. This means that EER is a multifunctional system that can not only replace traditional teaching aids, but also expand their capabilities.

MATERIALS AND METHODS

Such a concept as the structure of a textbook component can be transferred to an electronic educational resource. Necessary structural, closely interconnected with other components of this textbook, it performs its functions only by its inherent means and has a certain form; this is what is meant by the structural component of the textbook. An important structure of the textbook system is: extra -text

components, texts, components for managing the presentation of educational material. Traditionally, "Text is the "basic skeleton" of a textbook, it reveals its content, provides a consistent presentation of the material and complete, as well as the argumentation of all educational material; a text is a carrier of basic information that determines the volume and essence of the content of education" [8]. The text can be: additional, main, explanatory. Extra- textual components are designed to serve the text, facilitate its understanding, organize its assimilation, and contribute to the motivation of learning. The apparatus for organizing assimilation - questions and tasks, the corresponding answers to them, systematizing and generalizing tables, illustrative material, which is presented in the form of drawings, maps, diagrams, photographs, etc., are also needed.

Containing: a table of contents, headings of sections, paragraphs, name and subject indexes, it is necessary to ensure a quick search for the necessary information; as well as for the system for managing the procedure for presenting educational information, which is implemented through hypertext or in the form of a student-teacher dialogue management system, all these are components of managing the presentation of educational material. which contain the apparatus of orientation.

From all of the above, it follows that, as a form of implementing the content of educational material, the structure of an electronic educational resource should differ significantly from the structure of a traditional textbook by strengthening the role of non- textual components, as well as the emergence of a special system for managing the procedure for presenting educational information. The fact that the system of concepts being studied forms a hierarchical structure that unites them into a single system is assumed to be a feature of the teaching of disciplines.

When using a training software module, it is possible to reflect certain concepts and related representations. The relationship of such modules as part of the EER should correspond to the logical relationships that exist between the concepts. According to the levels within the disciplinary abstraction, modules must aggregate. Each module-paragraph, in turn, must consist of a set of standard blocks. The module must contain:

– information section, setting out the basics of theoretical material,

– an illustrative section that contains all the necessary information in an illustrative form,

– the control section, which contains a system of control questions and tasks, it provides control of the student's knowledge of this section of the educational material.

The authors of software implementations of e-learning tools are mainly limited to descriptions of specific interfaces. But the presence of a falling hierarchical menu does not determine its didactic qualities, it reflects only the hierarchy of the content of the educational material, that is, the "external, visualized" structure of the EER. The user interface is an analogue of the orientation apparatus of a conventional book textbook. Computer programs are much more complicated than the internal structure of the EC. It should be determined by partial orders, based on the required didactic properties of the electronic educational publication. In this case, links between individual elements can be established by the type of hypertext links. They predetermine a non-linear hierarchical structure of relations. To build a hierarchy, the criterion of presenting the material sequentially is used. Of particular importance in the electronic educational publication is the system of tasks. In such cases, the following structure is assumed.

In the form of three levels of the task hierarchy, interactions of two or more concepts at different levels of the course structure should be defined, depending on the specification of the concept itself, or:

1) tasks that specify each of the concepts being studied;

2) tasks that reflect the interconnections of the logical nature of the concepts of one within the disciplinary level of abstraction (i.e., single-level connections);

3) tasks that reflect the concepts of different levels of abstraction within disciplinary levels, interconnected logically. Each of these tasks contains a complex of several examples that provide a

gradual increase in the level of knowledge acquisition:

- an example that gives a primary acquaintance with a new element of educational material and ensures the formation of knowledge-acquaintances",

- a typical example, provides the formation of knowledge-"copies",

- an example that requires the formation of knowledge - "heuristics" (the level of heuristic activity) and independent processing of the orienting basis of actions known to the student.

The fourth level of this hierarchy, which corresponds to productive and creative activities, is excluded for reasons of ease of implementation.

RESULT AND DISCUSSION

The software implementation and design of an electronic resource is hampered by the fact that it not only provides theoretical reference material, but also provides the possibility of controlled training actions, subject to interactive feedback. An electronic educational resource must ensure the continuity and completeness of the didactic learning cycle for each given fragment of the content of the academic discipline. It is customary to single out the following stages in the development of an ESM [7]:

1. Form a creative team;

2. Determine the goals and content of training;

3. Develop a psychological and pedagogical resource scenario;

4. Programmatically implement the resource;

5. Test and debug and test the developed resource.

The electronic educational resource functions within the framework of the methodological system of teaching this subject quite effectively, which, along with the goals and content, also includes questions of the methodology and form of education. It is advisable to specify the methodology and form of education and the development process of an electronic educational resource should be supplemented with the relevant sections:

1. Determine the goals and content of training,

2. Form a methodology, determine the forms of training,

3. Develop a script for an electronic educational resource,

4. Programmatically implement an electronic educational resource,

5. Test and debug and test the developed electronic educational resource. Create supporting documentation.

To create an ESM, it is most expedient to use instrumental systems. Of course, their use somewhat reduces, in some cases, the effectiveness of the created ESM, however, the use of programming languages for resource development as an alternative will improve the efficiency of the developed system. But the cost of such development increases significantly and becomes more complicated. According to the results of the research, we can conclude that if the cost of development increases. That it significantly overlaps the efficiency, which is obtained in the end.

The main advantage of these tools is that they do not require knowledge of programming languages from the user. Such systems include a number of industrial systems such as "ELearning 3000", " Moodle ", " Hyper -method" and a number of others. Based on the proposed methods, an electronic educational textbook on the discipline "Computer networks, Internet and multimedia technologies" was developed for first-year students. It has been successfully tested in a practical educational process.

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