Technology of Creating Multimedia Electronic Educational and Methodological Complexes for the Course of Computer Science

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ABSTRACT

The article defines the educational and methodological complex (EMC) as one of the types of electronic textbook of modern computer learning tools, discusses the main functions that should be solved by the EMC in the discipline "Informatics" for students of the "Preschool education" direction, and also suggests the main stages of its application.

KEYWORDS: *electronic textbook, educational and methodological complex, hypertext structure, multimedia capabilities, knowledge control.*

The creation and organization of training courses using e-learning tools, especially based on Internet technologies, is a difficult technological and methodological task. At the same time, large labor costs for the development of e-learning tools are often not compensated by their effectiveness due to their rapid obsolescence. However, the industry of computer educational materials is expanding due to their demand and social significance.

In this regard, the development of concepts for the construction and use of multimedia teaching aids that are adequate to modern ideas for the development of education is relevant. One of the most popular computer learning tools has become electronic textbooks that allow you to implement the functions of learning, self-study, and demonstration of the material being studied, training in the application of the studied material, control and self-control, systematization of acquired knowledge and thus being a multi-purpose learning tool.

An electronic textbook is a comprehensive training program that ensures the continuity and completeness of the didactic learning process, provides theoretical material, provides training training activities and controls the level of knowledge, as well as an information retrieval function, mathematical and simulation modeling with computer visualization and service functions, subject to interactive feedback [1].

An electronic textbook - unlike a "paper" one, is a tool for learning and cognition, its structure and content depend on the purpose of its use. He is a tutor, trainer and self-taught. It acquires special significance when used in telecommunication systems.

Many teachers tend to expect an increase in the intensification of the educational process through the use of electronic textbooks, which can affect:

- ✓ increasing focus;
- ✓ increased motivation;
- ✓ increasing the informative capacity of educational content;
- ✓ activation of educational and cognitive activity of trainees;

- ✓ Accelerating the pace of learning activities.

An electronic textbook is effective when:

- ✓ there is almost instant feedback;
- ✓ it is possible to quickly search for the necessary reference information;
- ✓ there are demonstration examples and models;
- ✓ there is control

The democratization of society, including education, the informatization of all spheres of human activity created the prerequisites for the creation of a new generation of textbooks - interactive educational and methodological complexes on electronic media.

A modern educational multimedia complex (EMC) is an integral didactic system consisting of various electronic educational materials, using computer technologies and Internet capabilities and providing training and management of the learning process of students according to individual and optimal curricula [2].

Teaching materials for the discipline "Informatics" for students of the direction "Preschool education" combines the following functions:

Informational: to provide information in the learning process based on using electronic presentations, symbolic and animated objects, business graphics, information databases.

Organizational: organization of purposeful development of educational material on the basis of a differentiated-variative model of the educational process.

Motivational: to motivate the process of conscious mastering of educational material both in the classroom under the guidance of a teacher and outside of school hours.

Transformational: the development of educational material, its interiorization and exteriorization based on modern achievements in scientific and technological progress and accessibility.

Educational: education of a responsible attitude and a creative approach to work; economic culture and business ethics.

Developing: development of professionally important personality traits of trainees, their horizons and intellectual potential.

Coordinating: combining in the information product the possibilities of many teaching aids (hypertexts, diagrams, tables, charts, electronic presentations, etc.), their dosed and consistent presentation.

Systematizing: consistent and logical presentation of educational material, taking into account the possibilities and interests of consumers, sufficient scientific and technological significance.

Integrating: integration of various didactic tools with the possibility of a consistent dosed presentation of the necessary educational material.

Controlling: providing various forms of control of students' knowledge at all stages of the educational process.

Poliative: the possibility of using this educational and methodological complex at all levels of education, in the process of self- and mutual learning, individually and collectively.

In the structure of the developed teaching materials for the discipline "Informatics", five large interconnected blocks can be distinguished (Fig. 1), each of which has its own methodological,

didactic and functional load:

Rice. 1. Block diagram of teaching materials for the discipline "Informatics"

1. Block for the teacher - an electronic methodological manual, which includes the purpose and objectives of the course being studied, the course program; requirements of state standards, guidelines for the use of teaching materials in the educational process; a list of recommended literature, recommendations for practical work with control tasks and testing.
2. Block for students - a theoretical and practical block, which includes a textbook with control questions on each topic; lecture course accompanied by presentations; problem book containing three-level tasks on all topics of the course.
3. Library of useful resources (block of useful resources), which includes links to internal and external information resources.
4. Glossary (dictionary of terms) - containing all the basic concepts used in other blocks;
5. Reference block - user support for UMK.

The development of UMK "Informatics" contains the following steps:

1st stage. Preparation of texts for UMK.

At this stage, first of all, in accordance with the program, the place of the created informational product in the educational process, formulated goals and objectives, and in accordance with the E-selection of literature on the topic was made, a basic textbook was chosen - the basis of the developed teaching materials.

After the selection and analysis of the main and auxiliary material for the preparation of an electronic educational complex in "Informatics", a block diagram of the course is drawn up, consisting of blocks, parts, chapters and paragraphs. Each structural unit is assigned its own name and the layout of logically related structural units is defined. For each paragraph and section of the textbook, control questions (questions for self-examination) are compiled, with the help of which feedback is realized in the learning process.

Each section ends with conclusions and conclusions that correspond to the goals of studying this topic formulated at the beginning. The block for students contains a preface to the textbook and lectures, which indicates the purpose of including this material in the TMC, its compliance with the state educational standard. The stage ends with stylistic editing and control of the reliability, adequacy and relevance of the selected material. 2nd stage. Script writing.
The course script is written on the basis of the materials used in this manual.
According to the developed scenario, EMC "Informatics" should solve the following tasks:

- ensuring a consistent and systematic presentation of educational material with the ability to choose the pace and depth of study;
- management of independent educational work of students;
- quality control of knowledge acquisition;
- Ensuring effective information retrieval.

To solve these problems, the EMC uses a problematic presentation of educational material with two possible ways to consider it: a basic level and a level of increased complexity, which provides for a more in-depth study. The presence of two levels is realized with the help of a clear structuring of the material, the presence of hyperlinks and dosage in the presentation of the material on the screen. The student can choose the level of complexity of the presentation of the educational material and,

accordingly, the level of complexity of the questions in the control (self-control) of the assimilation of the educational material.

For the convenience of navigating through the EMC "Informatics", transitions are provided by hyperlinks within a paragraph, a chapter, and within individual blocks. All used concepts and definitions are explained outside the main text (links open in a new window), and access to them is provided using hyperlinks directly from the text of lectures or a textbook. Work with the dictionary is also provided as with an independent block of teaching materials. The transition to the dictionary is possible from the title page or using the navigation panel from any block of the teaching materials. 3rd stage - quality control of the developed CMD Quality control of performance is carried out in the following areas: content, didactic content, forms of presentation of educational material, design, etc. When choosing the method of designing teaching materials, the emphasis is placed, first of all, on the functionality and priority of educational goals.

Particular attention in the development of UMK "Informatics" is paid to the design of the content of the title page (main page). This page serves as a link between different blocks of the CMD and allows you to go to any of them when you open the CMD. In addition, the title page should give an idea about the course in question as a whole, about the authors and developers, and focus on the effective work of users who do not have much practice in using e-learning tools. For this purpose, the title page contains:

1. Link to information about the educational center where the development was carried out, information about the authors and developers of the electronic educational publication.
2. The name of the course on which the textbook was made.
3. Link to the list (menu) of the main blocks of UMK.
4. Call for help on working with UMK.

Focusing on the proposed placement of UMK "Informatics" on the Internet, it is necessary to provide for the heterogeneity of hardware among the intended users of the educational complex being developed and the variety of software used. Given that most Internet users use the Internet Explorer browser, this particular browser was chosen as the base one when developing the design. The educational multimedia complex in the discipline "Informatics" should have the following qualities:

- developed hypertext structure in the conceptual part of the course (definitions, concepts), as well as in the logical structure of the presentation (sequence, interconnection of parts);
- a user-friendly navigation system that allows him to easily navigate through the course, send emails to the teacher, go to the discussion section;
- Using the multimedia capabilities of modern computers and the Internet (graphic inserts, animation, sound, if necessary, etc.);
- the presence of a knowledge control subsystem built into the textbook;
- breaking down the course into small blocks (pages);
- the presence of a glossary (offline reference materials) and links to a glossary developed for this course, its individual modules or a series of courses;
- links to literary sources, electronic libraries and sources of information on the Internet;
- accessibility - fast loading, without complicating effects;
- Effective feedback with the teacher (e-mail, Web-conferencing, IRC-technologies (chat)) IRC

(Internet Relay Chat) - a tool for real-time communication over the Internet, which gives you the opportunity to talk with other people around the world in direct dialogue mode (most often using a set of phrases on a computer keyboard).

The issue of choosing technologies for the implementation of WCU is quite complicated, it requires the most careful and comprehensive analysis to select an approach to its implementation.

When choosing technologies, consider:

- ✓ user requirements;
- ✓ requirements of the author of the electronic textbook;
- ✓ requirements of the methodologist working on the teaching materials;
- ✓ Requirements for organizing the design and structure of the textbook [3].

All restrictions can be reduced to the following formulation: a modern electronic textbook should be convenient, visual, complete, and modular, with a well-thought-out structure and navigation that meets all methodological requirements, the author's requests, as well as the requirements of support and development, and, in addition, be implemented by the most in a practical way.

Thus, the advent of multimedia tools produces significant changes in education. The media possibilities are endless. Thanks to the feedback and live communication environment, multimedia-based learning systems are amazingly effective and significantly increase the motivation for learning. Teaching materials for the discipline "Informatics" for students of the direction "Primary education" allows not only to ensure the successful assimilation of the program in informatics, but also to form them at a qualitatively new level and in a larger volume, i.e. to ensure the achievement of a new, higher quality of education in higher vocational schools.

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