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COMPUTER SCIENCE TEACHING OF SCIENCE IN INFORMATION-METHODICAL IMPROVEMENT TOOLS

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ABSTARCT

In order for the teacher to effectively apply digital educational resources in the educational process, first of all, attention should be paid to the appropriate software. Obviously, training by highly qualified specialists: psychologists, science teachers, computer designers and programmers, it is necessary to work together to develop software products intended for the educational purpose. Many large foreign firms and a number of domestic software product manufacturers finance computer learning systems, digital educational resource creation projects in educational institutions and are making their own developments in this area.

The main requirement that must be observed in the design of digital educational resources aimed at use in the educational process is the convenience of the interaction of the student with educational materials. The corresponding properties and requirements of programs are usually defined by the abbreviation HCI (English Human-Computer-Interface – human-computer-interface), understood as “computer programs focused on human interaction”.

The software of the educational process can be divided into several categories:

- instrumental systems for creating digital educational resources;
- multimedia applications;
- test systems;
- automated education systems;
- electronic hyperlink training materials;
- modeling applications;
- means of communication;
- cognitive activity modeling tool;
- information search and transfer systems;
- demonstration-modeling and research programs;
- databases and expert analysis systems;
- control, training and control computer programs.

It should be noted that this systematization is conditional and all types of software intersect with each other. We will describe some of these software categories. Programs that allow the creation of new electronic resources, such as files of different formats, databases, software modules, individual programs and software complexes, are understood as instrumental tools. Such tools can be subject-oriented and hardly depend on specific tasks as well as the specifics of application areas.

The instruments are divided into two groups of instruments. These are:

1) public tools that are focused on web technologies and do not contain expensive special tools;
2) special tools aimed at the development of computer courses.

The main software tools included in the first group are divided into a number of categories according to their purpose:

- HTML and XML editors, including text editors;
- image and presentation graphics editors (vector and raster);
- 3D graphic editors;
- 2D and 3D-programs that show animation and multimedia scenes;
- re-encoders of text and graphic formats;
- sound file editors;
- video files editors;
- multimedia converters and re-encoders;
- animation creation tool;
- mail clients;
- tools for organizing chat, tele -, audio-and video conferencing;
- information search tools.

The easiest way to develop information materials (lectures, doclades, presentations) is the Microsoft Office application, in particular, the use of the Microsoft PowerPoint environment. In terms of the number of animation effects, this program equates with many author's tool multimedia tools

At present, sufficiently ready-made software tools have been developed that allow the creation of modern, very flexible digital educational and control tools, modeling and demonstration programs, sites, electronic hyper address textbooks, etc.

Instrumental systems provide the following opportunities for the teacher:

- preparation of multidisciplinary information (theoretical and demonstration materials, practical tasks, questions for test control);
- creating scenarios to create a specific digital learning tool;
- significantly reduce the time of training digital educational resources and conduct training (group control);
- the implementation of methods of presentation and training of material through the created digital educational resources.

Examples of such integrated instrumental environments of the second group are: WebCT, developed by the American company of the same name; Learning Space - Lotus firm; Asymetrix company TOOLBOOK II; Adobe AuthorWare; Hypermethod system; Distance Learning Studio; eAuthor electronic course designers; “Прометей” system; “Орок” system; “Урок” instrumental system; “БиГОР” system, etc.

Often such environments include not only the functions of developing educational materials, but also other functions inherent in automated educational systems. We present some of them. The ToolBook environment is a set of special authoring tools for creating multimedia applications designed for teaching. It includes ToolBook Instructor, ToolBook Actions Editor, and ToolBook Simulationeditor, with which you can quickly and efficiently create interactive content with a collection of multimedia objects of any format.

The Adobe Author ware environment is the best interactive multimedia educational application development environment today. The Instrumental environment allows you to create interactive tutorials with very interesting network Multimedia in organizational terms.

SunRav Book Office-there is another software environment. SunRav is made up of two programs, Book Editor and SunRav Book Reader, to create and view e-books and textbooks.

With the help of the package, you can create documents in EXE files, CHM, HTML, PDF format, as well as other (using templates). In books, you can take advantage of the full range of modern multimedia formats: audio and video files, images (animated), flash, any OLE objects, etc.
With the help of" Dolphin" - an instrumental environment for designing training courses, the following resources can be created:
- independent study of science-Oum (educational methodological complex);
- electronic textbook - study of theoretical materials;
- conducting practical training in the performance of assignments;
- conduct virtual laboratory work;
- automated knowledge verification system.
Educational and methodological complexes created using the instrumental tool" dolphin" are designed for use in full-time, day-time and distance learning forms.
In general, the concept of multimedia and multimedia tools, in particular, on the one hand, are closely related to the computer processing and presentation of various data, and on the other hand, the productive operation of IT tools has a significant impact on the effectiveness of the educational process.
Multimedia is the name of:
- technology that describes the procedure for the development, operation and application of various types of information processing tools;
- information resource created on the basis of various types of information processing and presentation technologies;
- computer programs related to the processing and presentation of various types of information;
- computer hardware that can work with different types of information;
- a special type of generalizing information that combines traditional static visuals (text, graphics) and various dynamic data (speech, music, video graphics, animation, etc.).
The tools used in the creation of Multimedia products can be divided into:
- static graphic data processing systems;
- systems for creating animated graphics;
- sound recording and editing systems;
- video montage systems;
- systems for integrating text and audiovisual information into a single project.
It should be noted that when creating multimedia hypertext resources and multimedia pages, the following languages and tools are often used for the Internet: hypertext character Language (HTML), Java language, VRML language (Virtual Reality Modeling Language) and CGI (Common Gateway Interface).
There are many multimedia development tools that allow you to create full-featured multimedia applications. Packages such as Adobe Directory or Autoware Professional are considered high-end professional and expensive creation tools, while Front Page, M Power, Hyper Studio and Web Workshop Pro are simple and affordable analogs. A number of companies are developing software tools that work with multimedia. For example, Microsoft has created the DirectX API application to control 3D graphics and sound effects.
Multimedia tools can be distinguished according to the following characteristics:
- environments that do not require programming;

- systems with programming tools;
- systems that involve programming in the style of “visual construction”.

There is experience using HyperCard, LinkWay, ToolBook, Visual Basic, Delphi among others in educational systems ' educational projects, designed to create multimedia projects in education. From the list above, the first three systems have built-in programming languages, although they allow you to create programs and not resort to programming tools. The last two systems on the list are a vivid example of a visual programming environment.

The use of information technology to assess the quality of Education provides a number of advantages over traditional control. First of all, it allows the organization of centralized control, covering the entire contingent of students, as well as making control more objective regardless of the subjectivity of the teacher.

A test system is a part-system or software product of an automated educational system designed to control the level of student mastery of educational material.

There are two main areas of application of test systems:

1) self-testing of students in the process of mastering educational materials;
2) control events organized by the administration of the educational institution and held with the aim of attesting the knowledge of students.

Currently, in the practice of automated testing, control systems are used, consisting of the following Target part-systems:

- creation of tests (strategy for the formation, survey and evaluation of a Bank of questions and tasks);
- testing (asking questions, processing answers);
- monitoring the quality of knowledge of students.

The Ideal test system should be highly intellectual, therefore, in conversation mode, it is necessary to recognize the answers of students and determine their correctness based on the content of the answer, ask additional questions regarding any aspects of the course under study, make recommendations for correcting the shortcomings identified in the student's knowledge.

In the test system, there are several different manifestations of the test, we can cite as an example: answers “yes” or “no”; choosing an option from the list of answers (from the menu); numerical value; answer in the form of a formula (mathematical or chemical); answer in the form of an ordered list; placing basic concepts, working with a graphic image, etc.

Currently, automated educational systems (ATTS) in various educational disciplines are being developed and applied in many educational institutions.

The automated educational system (ATT) is a modern collection of educational materials, designed for development, storage, transmission and access, educational purposes, and based on the use of modern information technology.

Exercise systems are a separate private manifestation of educational systems. Such systems are designed to strengthen the previously studied material, form certain skills and abilities.

They can be an independent tool or access the ATT as a subsystem.

Currently, the electronic hyper appeal textbook is the most common digital educational resource.

Interactive graphics (i.e., communication support mode) can be widely used in modeling applications, allowing the teacher to study the effects of changing parameters on outcomes

while observing the characteristics of the process being studied. Modeling programs can be autonomous, but are often used as part-systems in the ATT.

The development of information telecommunication networks provides a new impetus for the informatization of Education. The Global Internet network provides access to a huge amount of data from different parts of the planet.

Computer communications hardware includes several forms: email, electronic conference, video conferencing, Internet. These tools allow teachers and teachers to share information, collaborate in solving common problems, publish their opinions or comments, solve problems, and participate in their discussion.

The peculiarity of Internet technologies is that they give teachers and students great opportunities to choose the sources of information they need in the educational process:

- basic information hosted on the network's web and FTP servers;
- quick information sent to the client by regular email in accordance with the selected mailing list;
- leading libraries, information, scientific and educational centers, various databases of museums;
- Information in CDs, video and audio cassettes, books and magazines distributed through internet magazines.

Recently, with the development of Information Technology, the use of the internet and corporate intranet networks in remote training has become increasingly popular. The term E-learning (Electronic Learning) is e-learning that provides access to computer curricula using education management systems over an Internet network or corporate intranet networks. Synonymous with ELearning the term WBT (Web-based Training) is training through web technologies.

Software designed to support communication technologies includes:

- tools for organizing access to educational and methodological materials and working with them over the local network or the Internet;
- send training programs, tutorials and assignments in the networks; - organize and conduct tests through the network.

If we talk about tools for building Internet sites, then you can use special editors such as HTML editors, Microsoft FrontPage, Hot Metal, Corel Web Designer, Adobe Dreamweaver and others to create and view web pages.

In place of the conclusion, it is worth noting that the above-mentioned instrumental tools and software tools are the most used tools in the field of Education. Opening their capabilities and effective use in the educational process require the teacher to have an average qualification for the use of Information Technology. Modern tools now have a very perfect and easy-to-use interface that includes information processing, control, visualization, and the like.

The use of these tools opens up unlimited opportunities for both the student and the teacher, and thus the adaptation of the quality of education to World requirements is quick and easy.

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