

The Role and Possibilities of Multimedia Technologies in Education

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Abstract: The article discusses various approaches to the definition of the concept of "multimedia", as well as the didactic functions and properties of multimedia, which are an integral part of the theory and methodology of teaching. The development of multimedia educational technologies is analyzed. The reasons for the appearance of multimedia technologies in education, the differences in learning technologies when using multimedia, the advantages of learning technologies when using multimedia are shown.

Keywords: education, multimedia education, multimedia, didactic functions, didactic properties, multimedia technologies, presentation, slide, text, graphics, audio, video, computer.

I. INTRODUCTION

One of the priority tasks in training is the introduction of information and communication technologies, the creation of electronic educational resources, the design of telecommunication lessons. It is known that the use of a computer in the educational process is a requirement of reality. Information presentations began to be used in training. Information is one of the key concepts of learning. In modern times, it has taken on a broader meaning. Information directly conveys, from the point of view of learning objectives, the properties of objects. This type of information can include photographs, videos, arbitrary sound, called noise in science. Effective presentation and high-quality processing of information through the use of multimedia learning tools, which significantly affects its effectiveness. A set of teaching aids and technical devices, with the help of which the activities of the teacher and students are managed, facilitate the learning processes and make them more efficient. In this sense, multimedia tools have great potential. [7].

Creation and organization of digital multimedia applications in educational institutions, helps teachers in planning, developing and preparing high-quality multimedia materials to enhance the educational process. Modern multimedia applications use new technologies and are introduced into educational processes. Examples of such applications can be interactive learning programs, simulation and animation applications illustrating complex theories and concepts, web applications, etc. Such applications provide students with the opportunity to complete their tasks in multimedia using digital photos, blogs, marketing videos, videos student life, audio exercises for language disciplines. Multimedia applications also support distance learning. Successful multimedia applications are spreading to other universities in the country [3].

Creating multimedia applications requires high-performance computers with software for editing photo, audio, and video projects. Multimedia programming courses require separate classrooms (lab) for video and audio recordings and photography. And also, in this laboratory it is necessary to have the appropriate color and black-and-white printing equipment. In the Multimedia Programming lessons, students learn how to use these tools to create innovative multimedia educational and web applications. In order to make the most efficient use of new multimedia computer hardware, students are presented with an educational and methodological complex of the course "Multimedia programming" for mastering new multimedia equipment and software.

Applications created by students in the course "Multimedia Programming" are used in the educational process. Students learn how to create multimedia (with video materials) presentations in different areas (subjects). They study to carry out work on the preparation of materials, work on the content of video material for multimedia applications.

Multimedia applications will improve the quality of learning through:

- Creation of quality educational materials
- Helping students visualize complex concepts and theories
- Improving the effectiveness of language learning through interactive audio and video materials
- Quality control through evaluation and feedback for multimedia content
- Integration of training materials with practical tasks
- Use of interdisciplinary teaching materials
- Saving time and effort of teachers and students in the educational process
- Involving students in a more active educational process and keeping them motivated and interested
- Providing opportunities for extracurricular (extracurricular) and distance learning
- The acquisition of useful technical skills by both teachers and students [4].

Now in the country, Moodle, Hemis, Kundalik, etc. systems are used in educational processes. These systems allow you to monitor and manage almost all aspects of the educational process. But these systems work online. When creating exam tasks (especially when writing formulas), there are some difficulties. There is also this question before the course "Multimedia programming".

The creation of a multimedia application through programming aims to develop a more enriching technological learning environment. Given the access of modern students to computers, tablets and smartphones, the successful use of multimedia applications in education is an achievable goal [4].

The main objective of the course "Multimedia programming" is to improve the quality of the educational process. The use of multimedia technologies opens up new opportunities in the organization of the educational process, as well as in the development of the creative abilities of students. For the effective implementation of active learning methods, a large and serious work is needed to equip a sufficient amount of computer equipment, as well as to prepare a methodological and information base in the organization of the educational process. This will ensure the implementation of active learning methods in improving the quality of training specialists, taking into account the increased requirements in the market.

At present, multimedia technologies are one of the most developing areas of new information technologies in the educational process. So the main objective of the course "Multimedia programming" is to make the educational process more efficient, more accessible and more diverse. When using multimedia gadgets, one of the main tasks of society is to ensure the reasonable use of electronic resources. Moreover, a differentiated approach is needed in solving certain problems with the participation of subjects of different ages [1].

RESULTS and DISCUSSIONS

The term "multimedia" appeared in 1965 and was actively used in shows that use different types and forms of information presentation: slides, movies, videos, audio fragments, lighting effects and live music. In the second stage of the use of multimedia, the term multimedia was understood as

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representations based on static or dynamic images from several projectors, accompanied by sound or live music.

Multimedia affected several human senses at once and presented information in various forms: visual, auditory and created a deeper emotional impact. The possibility of influencing the emotional sphere of the human psyche is an important factor in learning, as it contributes to a more effective assimilation of knowledge. Over time, the term "multimedia" included various concepts. Recently, the term "multimedia" has become even more ambiguous [1].

Computers and home video editing software can also be considered as multimedia technologies. Smartphones can also be classified as technical multimedia tools, which send photos with voice signatures with their help. Multimedia continues to evolve. The term "multimedia" is translated as "many media" (many media).

The most complete description of the concept of "multimedia" is listed below:

- technology describing the order of development, operation and application of information processing tools of different types;
- information resource created on the basis of technologies for processing and presenting information of various types;
- computer software, the functioning of which is associated with the processing and presentation of various types of information;
- computer hardware that makes it possible to work with different types of information;
- a special generalizing type of information that combines both traditional static visual (text, graphics) and dynamic information of various types (speech, music, video fragments, animation, etc.).

So, "multimedia" means a range of information technologies that use various software and hardware in order to most effectively influence the user. The use of multimedia due to the simultaneous impact of graphic, sound, photo and video information has a great emotional charge and is actively involved in the entertainment industry, the practice of various institutions, home leisure, education.

Applications of multimedia technology in the field of education significantly increase the effectiveness of learning. It has been experimentally established that when the material is presented orally, the student perceives and is able to process up to one thousand conventional units of information per minute, and when the organs of vision are "connected" up to 100 thousand such units [1].

Multimedia means can be almost any means that can bring various types of information to learning, including traditional, obsolete analog means. Multimedia includes computers and their peripherals. The computer is a universal means of information processing, i.e. one and the same computer to process information of different types (multimedia information) and perform a whole range of operations with information. Therefore, a computer in conjunction with a set of peripheral devices is able to provide the performance of all the functions of technical multimedia tools.

A multimedia computer is a computer on which multimedia applications can fully realize their full potential. A multimedia computer displays graphic and video information, animation, plays various sound accompaniments, music and much more on the monitor screen. Usually, the term "multimedia computer" means the following composition: system unit (power supply, motherboard,

processor, RAM), video adapter, monitor, HDD, keyboard, mouse, DVD / CD-ROM, sound card, modem, TV tuner [2].

The computer will not work without the software. Software can be applied (multimedia encyclopedias, computer games, audio and video players, etc.), specialized for creating application programs (professional graphic editors, 3D graphics editors, sound editors, etc.), instrumental (languages programming, Visual Basic, Delphi, C++, C#, Java, Python, PHP, etc.).

Now most modern computers are sold with integrated drives, sound cards and powerful graphics adapters. To take advantage of all these media-enabled hardware, your computer must be running an operating system such as Windows or Linux.

Application software is also multimedia. For example, computer games, multimedia encyclopedias, video and audio players, programs for creating and viewing presentations, and many others. Multimedia technologies are a promising and popular area of informatics. The created multimedia product contains collections of images, texts and data, accompanied by sound, video, animation and other visual effects, including an interactive interface and other control mechanisms [2].

Multimedia technology has the following advantages and features that are actively used in the presentation of information:

- the ability to enlarge the image or its fragments ("magnifying glass" mode) while maintaining image quality. For example, presentations of works of art and unique historical documents;
- the possibility of image processing by various software tools for research or educational purposes;
- the possibility of extracting "hot words" into the image text or other visual material, for which the immediate receipt of reference or any other explanatory information is carried out (hypertext and hypermedia technologies);
- the possibility of continuous musical or any other audio accompaniment corresponding to a static or dynamic visual sequence;
- the ability to use video fragments from films, video recordings, etc., the "freeze frame" function, frame-by-frame "scrolling" of the video recording;
- the ability to connect to the global Internet;
- the ability to work with various applications (text, graphic and sound editors, cartographic information);
- the ability to create your own galleries from the information provided in the product;
- the ability to automatically view the entire content of the product in the form of a slide show or create an animated and voiced product guide;
- inclusion in the product of game components with informational components;
- the ability to freely navigate through the information and exit to the main menu, to the full table of contents or even out of the program at any point in the product.

There are concepts related to multimedia and the use of appropriate tools. For example, when using multimedia tools, illustration plays an important role. An illustration is the introduction of another type of explanatory or supplementary information (image and sound) into the text or giving examples for a clear and convincing explanation. Using illustrations, multimedia encyclopedias in

educational areas have been created, game situational simulators and multimedia teaching systems have been developed to organize the educational process [5].

Multimedia is an effective educational technology due to the qualities of interactivity, flexibility and integration of various types of information, it has the ability to take into account the individual characteristics of students and helps to increase their motivation.

Interactivity is the most significant advantage of multimedia tools. Interactivity allows you to control the presentation of information: the user can individually change settings, study the results, as well as respond to program requests for specific preferences, set the material feed rate, number of repetitions and other parameters that meet individual needs. This allows you to make flexible multimedia technologies.

Multimedia technologies allow the integration of many types of information. This allows the computer to present information in various forms. For example,

- text (text effects);
- images (scanned photographs, drawings, maps and slides);
- audio (voice recording, sound effects and music);
- video (complex video effects);
- animation (animation simulation).

The direction of multimedia technologies - virtual reality - is rapidly developing. Virtual reality is getting almost real sensations by a person from an unreal world. Modeling such an unreal world is done quite well with a computer. Computer tools create such complete visual, sound and other sensations that the user forgets about the real world around him and plunges into the virtual world with enthusiasm. The special effect of presence is achieved by the possibilities of free movement in virtual reality, as well as the possibilities of influencing this reality. The entrance to virtual reality is carried out through the computer screen, on which this reality can be observed. Moving and influencing the virtual world is usually carried out using the mouse and keyboard.

The WWW works with hypertext technology. The concept of this technology was put forward by Vannevar Bush, Douglas Engelbart and Theodore Nelson, in the 40-60s of the XX century. Nelson's 1987 definition of hypertext is a form of writing that branches or is done on demand. Otherwise, it is non-linear writing, which is more than text (hypertext). i.e., hypertext is a representation of textual information in which readers are given the freedom to navigate in a non-linear manner [7].

Hypertext is the Internet, a multimedia encyclopedia, a reference book, a book with contents and an index, as well as any text in which any links (indications) to other fragments are found. Hypertext offers new possibilities for accessing large and complex sources of multimedia information. The concept of hypermedia is introduced as a technology for presenting information of various types, based on the principles of hypertext. One hypermedia resource combines both the possibility of following hyperlinks and the advantages of using different types of information.

The main source of multimedia resources is the Internet. The Internet provides access to both educational resources containing information of various types (text, graphics, audio, video). Now multimedia and hypermedia technologies have become inseparable from telecommunication technologies, and the worldwide networks have turned into a large and well-structured repository of multimedia information [6].

Electronic mail (E-mail) - a system for storing and forwarding messages between people who have access to a computer network. By means of e-mail, any multimedia information (text documents, images, digital data, sound recordings, etc.) can be transmitted over computer networks. Other popular services that implement the exchange of multimedia information are teleconferences, NetMeeting, automated search for multimedia information (Google, Yandex, Rambler, etc.) and instant messengers.

There are many software tools for designing and developing multimedia applications. Here are some of them:

- Programs for creating and processing images;
- Programs for creating and processing animation, 2D, 3D graphics;
- Programs for creating and processing video images;
- Programs for creating and processing sound;
- Programs for creating presentations;

With the help of the connection of multimedia technologies and development tools, as well as hypertext, hypermedia resources are created. There are a huge number of hypermedia resources and a large number of tool systems for creating these resources. Here are some of them:

- HyperWave
- Microcosm
- Storyspace
- World Wide Web

For the development of hypermedia, programming languages such as SGML, HTML, etc. are used [8,9].

CONCLUSIONS

Everyone knows multimedia technologies are used in almost many areas of activity. Programmers, screenwriters, designers are working on the creation of new projects. The main purposes of using products created in multimedia technologies are:

- promotional and entertaining;
- scientific and educational;
- research - in museums, archives, etc.

In the near future, it will serve on the basis of advanced multimedia computer-aided design (CAD) systems. The promise of nanotechnology will bring multimedia technology to another level in the learning process. Finally, in the near future, multimedia technologies will become an integral part of the daily life of mankind.

In the study of this material, we got acquainted in the process of using multimedia technologies in education, they have the following advantages compared to traditional education:

- use of text, color graphics, animation, sound, hypertext;
- the possibility of constant updating;
- low costs for publication and reproduction;

- the ability to place interactive web elements in it, for example, tests;
- possibility of copying and transferring parts for quoting;
- the possibility of non-linear passage of material due to hyperlinks;
- hyperlink with additional literature in electronic libraries or educational sites.

Multimedia technologies are widely used in educational and organizational-pedagogical activities in almost all educational institutions. This was especially true during the coronavirus pandemic. Classes were planned using a computer or electronic computer knowledge testing became ubiquitous. The use of multimedia technologies in the educational process raises it to a qualitatively new level, positively affects the motivation of students to study, increases their level of consistency and activity in choosing methods for solving the problems they face.

An extensive area of application of multimedia technologies in education is organizational and managerial activity. In the automation of this activity, tools based on multimedia technology are used.

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