Multimedia Technologies As A Basis For The Development Of Modern It Education In Ukraine

Nataliia Seiko [†]**, Mykola-Oleg Yershov**[††]**, Anna Sakhnenko**[†††]**, Marina Shevchenko** [††††]**,**
Roman Bezsmertnyi[††††]**, Inna Kostyrya** [††††]

maxnik8888@gmail.com

[†] Department of Social Technology, Ivan Franko Zhytomyr State University, Ukraine
[††] Postgraduate Student at the Pedagogy Department, Ivan Franko Zhytomyr State University, Ukraine
[†††] Department of Physical Education, Sumy National Agrarian University, Ukraine
[††††] Department of the International Relations, Kyiv National University of Culture and Arts, Ukraine

Summary
This article analyzes the state and development of multimedia technologies in the educational process. The reasons for the emergence of multimedia educational technologies are shown. The definition of the concept of "multimedia education" is given. The advantages and disadvantages of teaching using multimedia technologies are presented.
The article, based on multimedia technologies, provides one of the ways to solve the problem of lack of classroom time for the presentation of all educational material in the process of teaching engineering students. The creation and application of educational videos in education is discussed, an example of teaching electrical engineering is given; the requirements for the development of video lessons, their advantages and importance in the educational process are indicated.
Key words:
Innovative teaching, Higher education, Teaching technology, Multimedia technologies.

1. Introduction

Modern society is characterized by qualitative socio-economic and cultural changes associated with the introduction of information technology in all areas of education and science, production, management, business, culture. The terms "multimedia", "multimedia technologies" (or "multimedia technologies"), "multimedia resources", "multimedia products", "educational multimedia", "multimedia teaching aids", "multimedia visualization" are often used in the information environment. information ", etc.
Let us first consider one of the main concepts of this article - the concept of "multimedia", its nature and distinctive features, what is its role and value for educational purposes. We will also reveal the features of our study aimed at developing a methodological system for teaching future

teachers to use information technology, especially multimedia. After all, at present there is a problem of improving the training of future teachers for the design, development of modern teaching aids - teaching multimedia.
The term "multimedia" is Latinism, which came from English-language sources in the original transcription; comes from the combination of English words - "multy" (folding, consisting of many parts) and "media" (environment, means). Hence, literally, "multimedia" means "multi-medium", "poly-environment" [1-4].
We define the term "multimedia" as a computer technology that allows you to present content through a combination of different types of information - both through traditional static information (text, graphics) and through dynamic (animation, speech, music, video). Multimedia is a single digital space, in syncretic form representing different ways and types of information presentation.
The term "multimedia" also refers to the end product made on the basis of multimedia technology, and multimedia tools and shells, and modern computer equipment (the presence of a DVD-ROM drive in the computer; audio and productive video card; the presence of a large amount of memory, productive processor, monitor resolution and more).

2. Theoretical Consideration

Note the important features of multimedia resources (including educational resources) in contrast to non-multimedia:
- information in them is presented in digital form and can be contained in different types (in the form of text, sound, graphics, animation, video) and in different combinations of these types in one resource;
- information in them is organized on the basis of hypertext technology and hypermedia technology;

- the information in them is presented interactively that provides an opportunity of active interaction of a resource, the program, service (on the one hand) and the person-user (on the other hand), their mutual influence. This is an essential feature of multimedia resources.

Due to the simultaneous impact on the user of graphic, audio and visual information, multimedia tools have a large emotional, spectacular charge, so they are actively used in educational practice [2, 3]. At the same time, thanks to the ability to visually, spectacularly present information, educational multimedia allows to implement the fundamental principle of clarity in learning at a qualitatively new level.

Multimedia is also actively used in other information institutions, in business and advertising, in the entertainment and leisure industry, ie. where it is necessary to effectively transfer large amounts of information per unit time. It can be concluded that in the emerging information society, the educational, cultural and social role of multimedia is increasing, the age of multimedia digital culture is coming, in which people gain knowledge, learn in a new form - through a multimedia resource. In general, "the fundamental difference between the information society and the industrial one is that the main thing in it is not the desire to saturate the production of goods from all available raw materials, but the wealth of knowledge gained from information multimedia resources to maximize the use of advanced technology to meet material and spiritual needs. society "[6].

Multimedia technology qualitatively changes the ways of formation of visual information on the basis of synthesis of media (graphics, animation, video, sound, text), dynamics, interactivity, modeling. At the same time, for educational purposes, multimedia allows you to create a more progressive, environmentally friendly, ergonomic environment for displaying educational content, its visual interactive modeling and research (because man by nature perceives more than 90% of information about the environment visually). The mechanism of multimedia visualization is based on a syncretic combination of emotional, informative and aesthetic components, in unity giving educational effect; it makes the performance exciting, arouses increased interest and attention from the audience. The hypermedia construction of educational multimedia provides a personality-oriented, developmental nature of learning.

Extraordinary expressiveness, entertainment of multimedia are important when working with a new generation of video, easily absorbing knowledge through the works of screen computer culture. After all, just as oral primitive culture gave way to handwritten, later - printed, so the latter loses its dominance with the development of screen computer culture in the era of mediatization of the information space. Having a whole arsenal of means more expressive than text, she operates not with words, but with audiovisual images. Computer multimedia culture forms in students the readiness, predisposition to perceive, learn about the world through the visual representation of information based on new information technologies, readiness to work in the emerging information society.

Accordingly, if earlier in the educational activity the main thing was the verbal dialogue of the student and the teacher, now the audiovisual dialogue when working on the computer comes to the fore. Such visual-sensory activity becomes an integral part of human learning and self-development.

In the conditions of active development and penetration of multimedia technologies into education, the fundamental didactic principles of learning (the principle of clarity of learning, accessibility to learning) thanks to multimedia technologies became possible to implement at a qualitatively new level. Moreover, new information technologies in education should not be considered as a direct replacement of the existing pedagogical foundations, but as qualitatively new opportunities to increase their effectiveness.

Thanks to multimedia technology, the principle of clarity in learning has become possible to implement through the method of multimedia visualization of content, ie. through interactive multimedia visualization of educational information.

This way of visualizing information can be considered as a new visual method of learning. It is based on the fact that the main source of knowledge, the means of cognition are multimedia visual images of the studied objects, presented to the student through the screen in an interactive-intellectual mode. Assimilation of educational content occurs through their emotional and sensory perception, combined with interactive actions on them.

It follows that a fundamentally new type of educational visualization can be used in teaching - multimedia visualization. We called it "interactively staged intellectual clarity for emotional-sensory cognition." It clearly presents the material in the form of computer visualization (it is a didactically new form of visual representation of knowledge). Its main didactic unit is a multimedia audiovisual image.

Thus, multimedia visualization is a system of multimedia images of the studied objects and phenomena modeled for educational purposes and presented by means of the screen. The system has a hypermedia architecture that allows you to build a flexible individual trajectory of its study. Its constituent images, as well as any models, clearly reflect first of all those qualities of the studied which are important for opening of its essence according to tasks of training; at the same time in interactive and intellectual mode, in the form staged for screen display (emotionally spectacular, dynamic, divided in time according to a scenario technique of giving of material

and management of attention), in the integrated format (synthesis of graphics, sound, video, animation, text).

Our research is aimed at developing a methodological system for teaching future teachers to use information technology, especially multimedia. In general, in these conditions of informatization of society, the most important direction of modernization of education is the preparation of future teachers for life and professional activity in the information society, a competent teacher with a high level of information culture, able to effectively apply new information and multimedia technologies.

In educational practice, when teaching multimedia technologies at the university to students of various fields of training (pedagogical and non-pedagogical areas) in the course "Multimedia", as a rule, the following aspects are studied: general issues of hardware and software of multimedia technologies; technologies for creating multimedia products; applied tasks for the development of specific software tools and the development of multimedia products based on them; features of using individual multimedia products or on the Internet, etc.

Let's highlight the features of the organization of training of students of pedagogical directions of preparation for the development of educational multimedia. After all, it is obvious that future teachers will have to work in the age of multimedia culture. It is important for them to know the possibilities, didactic potential of multimedia, to be able to implement it, it is important to know the technologies of creating effective multimedia teaching aids and technologies of multimedia visualization. For a modern teacher, mastering these technologies becomes a prerequisite for the effectiveness of his professional activity.

However, a number of authors studying the phenomenon of educational multimedia note its insufficient development from the standpoint of pedagogy, psychology and methods of teaching the development of educational multimedia.

Our study of the current system of training future teachers to develop multimedia forms of knowledge transfer (primarily means of interactive multimedia visualization of educational information) has also shown that technocracy still dominates here. First of all, the software and hardware aspects of multimedia are considered; techniques for working with computer software are considered an end in themselves. It is rare to create multimedia products with predefined properties for the implementation of certain methods of teaching and solving didactic problems. In their development, the emphasis is not on learning, not on helping the student, but on the technology of software implementation [1].

It is also often recommended to use the old methodology for the development of fundamentally new educational multimedia tools. As a result, the created multimedia manuals simply duplicate the content of printed manuals in electronic form, do not realize the potential of multimedia as a qualitatively new means of learning, the potential of new information technologies.

More often than not, in the learning process, attention is not paid to how one should first design, simulate, and stage the content of a multimedia product with an orientation to the screen language. A systematic approach to the design of multimedia (from the point of view of pedagogy, methodology, psychology, ergonomics, design), creative dramatization of its form with an orientation to the language of the screen to obtain a didactically effective new teaching tool [5] is not disclosed.

Therefore, on the part of the students being trained - future teachers, the formation of multimedia content occurs, as a rule, spontaneously-intuitively. The trainees do not comprehend the holistic picture of the process of developing multimedia visualization tools, which guarantees the receipt of really useful, professionally significant tools, they do not get the fundamental foundations of the area under consideration.

The situation is aggravated by the lack of systematic, scientifically grounded teaching methods for converting information from book-text forms to screen multimedia forms.

This forms in students a fragmentary, clip-like thinking and leads to the preparation of superficial users of the benefits of automation, who do not bother themselves with a creative search for appropriate forms of presenting educational material, intellectual reflections on planning activities in order to obtain really didactically effective products.

As a result, more often future teachers, possessing the skills of working with software, cannot efficiently organize their activities to create didactically valuable visual teaching aids that effectively convey educational content using the method of multimedia visualization, which implements the principle of visibility at a qualitatively new level.

Hence the aforementioned problem of improving the training of future teachers for design, the development of modern teaching multimedia tools (primarily tools for interactive multimedia visualization of educational information, effectively implementing the principle of visibility in teaching).

Therefore, the task that we carry out is the development of the content and technology of training future teachers of professional training in the design of effective teaching multimedia tools, multimedia support for classes, interactively visualizing educational content; overcoming the prevailing technocratic approach in this area of education.

So, within the framework of the special course program "Multimedia teaching tools" developed by us, students master multimedia technologies in the process of studying the following issues (educational topics):

1) multimedia as a phenomenon in culture and education; the possibilities of multimedia as a hypertext and hypermedia system, as a form of collective consciousness and information retrieval environment, as a means of electronic interactive communication (on the example of the Internet); didactic potential of multimedia, implementation of the principle of visibility in teaching;

2) the essence, strategy of a systematic approach to the design of educational multimedia;

3) principles, techniques for structuring information for multimedia; techniques for converting a book text into a laconic structured text, followed by the creation of a multidimensional hypertext base for multimedia; the principles of converting a book text into a language of images, into a culture of a multimedia screen;

4) general issues of computer design; determination of a single style, color and graphic solution for the product (development of the concept of a graphical interface for a multimedia product);

Offering creative assignments to students and organizing their creative projects to develop educational multimedia products:

5) collection of information, its structuring for building into a hypertext structure;

6) development of a multimedia pedagogical scenario (the basics of multimedia pedagogical design) based on a systematic approach;

7) Internet search or photography, scanning of photographs, illustrations and other types of graphics and obtaining graphic resources; importing them from different formats to the required format;

8) subsequent targeted processing of graphics for a multimedia product;

9) principles, technology of creating a system of hypermedia links of individual components of the product into a single whole;

10) filling frames with laconic structured text;

11) inclusion of video fragments, soundtrack;

12) testing the work of the developed product [4, 5].

Note that technologies for processing digital graphics, video, sound, technologies for working with various multimedia editor programs are considered primarily in other academic disciplines listed above ("Multimedia", "Computer Graphics", "Pedagogical software", "Information technology in education "). At the same time, with a small number of academic hours, we believe that when studying these technologies, first of all, one should consider the technologies for processing graphics and animation, as one of the main tools for creating multimedia, the minimum necessary means of visual non-verbal transmission of information in multimedia.

The specified special course "Multimedia teaching aids", dedicated to pedagogical design and development of multimedia teaching aids, interactively visualizing educational content, effectively implementing the principle of visibility, as well as dedicated to the use of information technology in education, is intended for students of various forms of education (full-time, part-time and through the developed electronic version of the course - distance).

Conclusions

Thus, we can conclude that the main thing in a multimedia presentation for a teacher is thesis, and for students - clarity. Currently, multimedia encyclopedias have been created in many school disciplines and educational areas. Game situational simulators and multimedia training systems have been developed that allow organizing the educational process using new teaching methods.

Multimedia technologies can be applied in the context of a wide variety of learning styles and be perceived by a wide variety of people: some prefer to learn through reading, others through listening, others through watching videos, etc.

The use of multimedia technologies allows us to make the learning process flexible in relation to social and cultural differences between students, their individual styles and pace of learning, and their interests.

Thus, multimedia technologies enrich the learning process, make learning more effective, and also contribute to the formation of cognitive interest among students.

References

[1]   Brookhart, S. M. Évaluer pour faire apprendre. Dans Ménard, L. et St-Pierre, L. Se former à la pédagogie de l'enseignement supérieur. Montréal : Chenelière-Éducation, 2010. No available online.

[2]   Cuq, J.P. Dictionnaire de didactique du français langue étrangère et seconde. Paris: Clé internationale, 2003. Available at: https://www.worldcat.org/title/dictionnaire-de-didactique-du-francais-langue-etrangere-et-seconde/oclc/76811758.

[3]   Remond, M. Evaluer l'activité de lecture. Les Journées de l'Observatoire : La lecture de 8 à 11 ans. Paris : Observatoire National de la Lecture, 2001. Available at: http://veille-et-analyses.ens-lyon.fr/DA-Veille/20-september-2006_EN.pdf.

[4]   Vecchi, G. Evaluer sans dévaluer. Paris: Hachette, 2014. Available at: https://dumas.ccsd.cnrs.fr/dumas-01312936/document

[5]   Vergnaud, G. Psychologie du développement cognitif et évaluation des compétences. L'activité évaluative

réinterrogée. Regards scolaires et socioprofessionnels. Bruxelles : de Boeck Université, 2001. Available at: https://www.erudit.org/en/journals/mee/1900-v1-n1-mee02554/1036765ar/abstract/.

[6] Rieger, C. R. How (not) to be rude: Facilitating the acquisition of L2 (im)politeness. Intercultural Pragmatics. 2018, V. 15, Issue 5, p. 651–691. Available at: https://www.degruyter.com/document/doi/10.1515/ip-2018-0023/html.

[7] Ogiermann, E. Politeness and in-directness across cultures: A comparison of English, German, Polish requests. Journal of Politeness Research. Language, Behaviour, Cultur., 2009. V. 5. Issue 2. p. 189–216. Available at: https://www.academia.edu/6422196/Ogiermann_E._2009_Politeness_and_indirectness_across_cultures_A_comparison_of_English_German_Polish_requests._Journal_of_Politeness_Research_5_2_189-216.