

USING MULTIMEDIA TECHNOLOGIES IN THE TEACHING PROCESS OF HIGHER MEDICAL EDUCATIONAL INSTITUTIONS

Introduction. The acceleration of technological progress caused by the rapid development of information technologies is fundamentally changing the image of modern society. The nature of these changes affects different areas of human activity and consists in expanding information space of human existence. Undoubtedly, information technologies (hereinafter – IT) cause the transformation of society and its institutions. In this context, the sphere of education, whose task is to ensure favourable conditions for rapid adaptation of a person to the information society, and accomplishment of a person's potential, including the professional one, is no exception. Orientation of education at accomplishing the potential of an individual results in the advent of innovative educational technologies, including the leading role of the IT and computer technology (hereinafter – CT) [1].

Problems of informatization of education have already been considered in the works of M. Zhaldak, N. Morze, O. Spivakovskiy, M. Shkil and others. Some issues of the use of information technologies in medicine have been analyzed in the works of A. Bogomolov, V. Helman, A. Safronov, V. Vasilkov. The basics of using the new information technologies in educational process have been represented in the works of Yu. Baranovsky, J. Vahramenko, B. Hershunsky. The pedagogical fundamentals of the problem of medical science development and the content of university training of future doctors have been provided by the works of H.S. Batischev, V.A. Dmytriyenko, I.S. Ladenko, V.A. Lektorsky.

Despite a number of studies on the problem of using multimedia technologies in the educational process of Ukraine, the issues of their implementation in the context of professional training, including the use of modern computer technology in the educational process in higher medical educational institutions still have not been sufficiently considered.

The aim of the study is the scientific substantiation for the efficiency of multimedia technologies in training of future doctors.

Results and discussion. Computerization and informatization of higher education are the priority directions in the development of education under conditions of transition to information society. New learning environment with new information technologies is characterized by flexibility, openness, accessibility; it provides students with the possibility of free choice of content, time and forms of learning; it develops students' cognitive interest, creative thinking, forms the "ability to work in the computer environment" [2].

The learning process of students in higher educational institutions is characterized by certain specific features related to the fact that in certain circumstances, the future doctor may be required to demonstrate not only expertise for effective clinical work, but also educational and organizational skills, ability to navigate in today's information space [3, p. 113].

Multimedia technologies (hereinafter – MT) constitute one of the innovative areas that are used in classroom environment. In a broad sense, researchers define MT as the spectrum of information technologies that utilize a variety of software and hardware means for the most effective impact on the user.

The widespread use of MT is able to dramatically increase the effectiveness of active learning methods for all forms of educational process: during students' self-training, at lectures, at seminars, during practical and laboratory work.

Multimedia training tools used in the educational process of medical schools should be relevant in terms of psychological, pedagogical and methodological requirements (Figure 1).

It has been experimentally established that during oral presentation of the material, listener perceives and processes up to one thousand of conventional units of information, while after "connection" of visual organs – up to 100 thousands of these units [4, p. 107]. Therefore, high

efficiency of MT in education has been clearly demonstrated, since visual and auditory perception of the material is the basis of MT.

Using multimedia means ensures effective flow of perceptual and mnemonic processes; it develops cognitive activity of students by modelling, simulating typical situations of professional orientation.

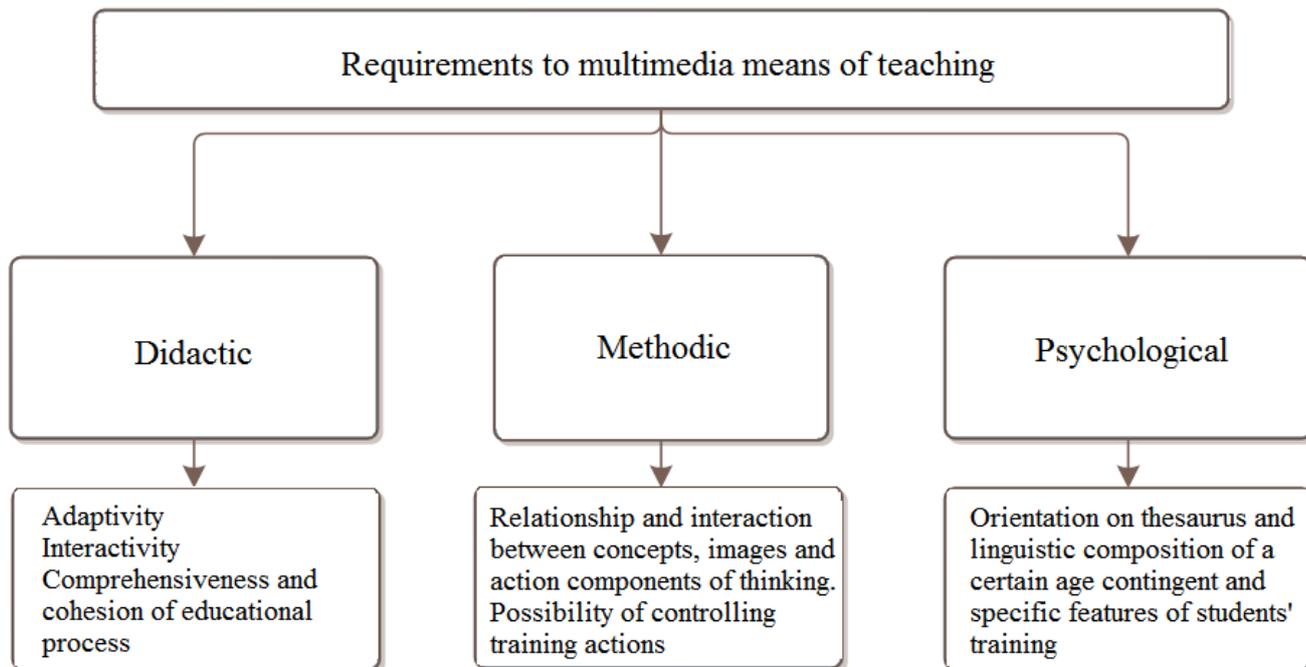


Figure 1. Requirements to multimedia in the teaching process

Graphic series, including creative thinking, helps students to perceive the educational material comprehensively; they have the opportunity to combine theoretical and demonstration material (Figure 2). It is known that almost 80% of information is perceived by sight, and only 20% – by mental efforts of memory. Visual information of illustrations allows the significant reduction in verbal description; it promotes better and deeper mastering of the material.

At present, lecture serves as an organizational form of training – a specific way of interaction between teacher and students, in which a wide variety of content and teaching methods is implemented. The purpose of any lecture is to introduce new concepts in the complex of links between the already known and new material. Understanding the lecture’s material is a complex mental process, based on the art of perceptual knowledge – the skills that promote successful functioning both in the society and in professional life [4, p. 107]. Using multimedia in the lecture form for training future doctors is due to the peculiarities of subjects and tasks that require to include into the content of training the material of significant amount and diverse information, the assimilation quality of which is only possible upon condition of multi-sensory stimulation of students’ perceptual areas. We consider it appropriate to develop a branched presentation that enables, if necessary to “adapt” to the mood of the audience and take into account the students’ contingent of a certain direction of training.

The essence of presentation’s positive effect is to implement the principle of demonstrativeness; stimulation of memorizing the lecture’s material; conscious mastering the phenomena and processes under consideration; concentration through virtual diversity; time saving; increasing the volume and improving the quality of presentation of educational material [5, p. 107].

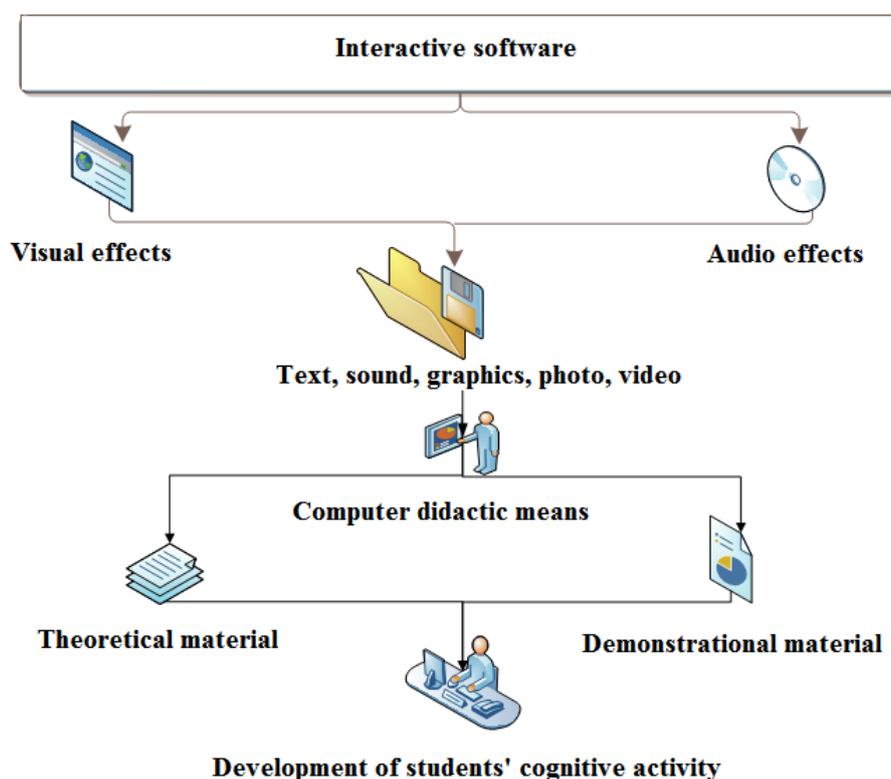


Figure 2. The development of students' cognitive activity by means of multimedia

The advantages of lectures with the use of IT consist in the ability to visualize certain processes and phenomena, to simulate complex experiments, to develop mental abilities of students and others. In addition, the multimedia presentation allows engaging multiple channels of perception, thus achieving the integration of information delivered by different senses. Thus, there is the possibility of introducing a large number of graphic images that require certain amount of knowledge in anatomy, biology. It serves as a motivating factor for students, confirming the presence of interdisciplinary integration [6, p. 56]. Multimedia lecture enables you to organize the audience's attention in a phase of its biological reduction (25-30 minutes after the beginning, and last minutes of the lecture) through the aesthetic use of slides and by appropriately applied animation and sound effects. In addition, the use of multimedia presentations can significantly increase the informativeness of lecture, repeat the most difficult moments of lecture (trivial redundancy), promote accessibility and perception of information by the parallel presentation of information in different modalities: visual and auditory, repeat (review) the material of previous lectures, create a comfortable working environment for the lecturer.

MT enables to use the training material based on the topic's content and the laws of psychological interaction. Such technologies can increase the informative educational material via video demonstration of different cases of medical practice in dynamics, not only displaying the static shots. The examples of such cases are emergency medical care, the study of structure of organs and biological tissues, analysis of physiological changes in the process of functioning. Such a presentation of educational information during lectures, practical classes and laboratory work in the study of complex structures (for example, the structure of biological membranes, hemodynamics, the structure of muscle fibers, etc.) renders the material more accessible.

Multimedia illustrative materials, in addition to supporting the ability to learn, enable to consider various phenomena in the complex multilevel entirety. Thanks to these illustrations, numerous bilateral connections are formed in the human brain (Figure 3).

Multimedia lecture possesses a hypertext nature: information is structured and linearly generalized, the knowledge is integrated. Hypertextuality promotes deep penetration into the content of the material, facilitates the balance in understanding the information. Slide presentation

teaches to structure and interpret information, activates creativity of students, makes it possible to form conditions for alternative solutions and implement interactive connections. Technology of presentation at multimedia lecture activates the students' creativity and develops convergent and divergent thinking, since during the lectures they are introduced to the active cognitive process [7, p. 237].

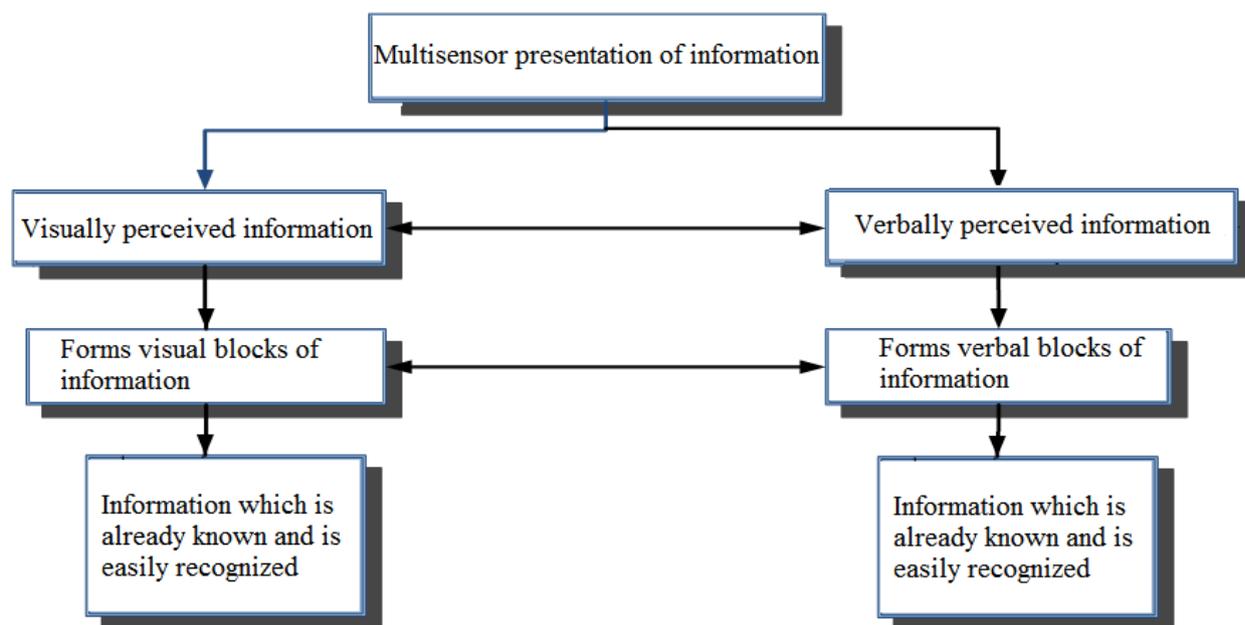


Figure 3. The multilevel system of new connections and blocks of information.

Conclusions. In terms of higher education, there is a problem of professional training of future specialists, which in addition to professional skills, should be focused on the modern information space. The requirements of the information society are posed in front of medical education as well. MT as a way to implement the content of the curriculum is one of the most promising means of informatization in educational process at medical universities. Multimedia lecture is one of such forms. The degree of mastering the material during the lecture sessions depends on many factors, but the most effective one is the use of complex audio-visual means by which the human brain learns information better. Multimedia materials allow to model and simulate complex biological processes of the human body, to represent a large number of graphic images simultaneously. Multimedia means form the complex multi-level connections in the human brain and thereby activate the creativity of students and develop their cognitive activity.

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Аннотация

В статье сделан краткий обзор проблемы информатизации образования, в частности рассматриваются вопросы целесообразности использования мультимедийных технологий в учебном процессе будущих медиков. Актуальность проблемы связана с новыми требованиями, которые ставит перед врачами информационное общество. Мультимедийные технологии (МТ) выступают комплексом информационных технологий, которые включают программные и технические средства с целью активного воздействия на пользователя. Такие технологии широко используются в учебном процессе, в частности на лекционных занятиях и на этапе самостоятельной подготовки студентов. Мультимедийные презентации на лекциях позволяют симулировать физические и биологические эксперименты и явления, развивают познавательную активность студентов, позволяют моделировать сложные ситуации профессионального направления. Они дают возможность сочетать теоретический и демонстрационный материал, визуальные и аудио-эффекты в единое дидактическое средство. Также использование МТ значительно повышает информативность лекции за счет одновременного представления информации и в визуальной, и в слуховой модальности, учитывая многоуровневые связи в учебном материале. Перечисленные возможности способствуют лучшему усвоению информации студентами и созданию благоприятных условий работы преподавателю.

Ключевые слова: информационные технологии, компьютерные технологии, мультимедийные технологии, мультимедийные лекции, познавательная деятельность.

Abstract

The article presents a brief overview of the problem of education informatization, in particular it considers the issue of the feasibility of multimedia technologies in training future physicians. The urgency of the problem is associated with the new requirements which doctors face in the information society. Multimedia technologies (MT) are the complex of information technologies which include software and hardware for the purpose of active exposure to the user. Such technologies are widely used in the educational process, in particular at lectures and on the stage of students' self-study. Multimedia presentations at lectures allow to simulate the physical and biological experiments and phenomena that develop cognitive activity of students, and to simulate complex professional situations. They provide an opportunity to combine theoretical and demonstration material, visual and audio effects in a single didactic means. Furthermore, the use of MT significantly increases the information content of the lecture by the simultaneous presentation of information in the visual and auditory modalities, taking into account the multi-level links in the training material. These capabilities promote better assimilation of information by students and create the favorable conditions for teacher's work.

Keywords: information technologies, computer technologies, multimedia technologies, multimedia lectures, cognitive activity.