

Valeriy Mytsenko
(Kirovohrad, Ukraine)

APPLICATION OF MULTIMEDIA IN THE PROCESS OF FORMING FUTURE SPECIALISTS' PROFESSIONAL SKILLS

В статті розглянуто використання мультимедійних технологій у навчальному процесі. Представлені основні види використання комп'ютерних та мультимедійних технологій в освітньому середовищі та наведено класифікацію інформаційних технологій навчання згідно дидактичної спрямованості.

Ключові слова: мультимедійні технології, інформаційне суспільство, системи програмованого навчання, інтелектуальні навчальні системи.

The article discloses the usage of multimedia technologies in the process of teaching and learning. The main ways of computer-based and multimedia technologies in educational environment were presented. The classification of information technologies according to the didactic direction was offered.

Key words: multimedia technologies, information society, systems of programmed instruction, intelligent tutoring systems.

The development of science and technology, the expansion of production and high-tech industries determine the growth of information in various fields of knowledge.

The volume of information doubles every 15 years, which requires a more complex usage of specific information technology. This makes us look for the way to become a new Ukrainian "information society", that is, the one where objects and work results of most of working population are the information and knowledge. The society with powerful development of information technology, communications technology, integrated communication systems, information networks with highly sophisticated features and diverse service. The application of advanced information technology and information techniques leads to radical changes in the socio-economic aspects of the society. There is a growth of conditions for enhanced and effective use of information resources – the most important strategic factor of development. This application allows saving other resources such as raw materials, energy, equipment, human resources, social time, etc. IT and machines play a critical role in the information exchange among people, in compiling and distribution of

information, in the process of intellectualization of society and in the development of its education and culture.

The rapid growth of information has led to controversy: various kinds of information have increased and cover most of different needs, but at the same time there is huge circulation of redundant information. We accumulated huge information capacity but people can not use it at their most because of the physical and technical constraints. The introduction of automated information processing tools can cope with these contradictions.

As a result of the process of informatization there appears information society. This concept was formulated in the late 60's – early 70-ies of XX century by Y. Hayashi [4: 4]. The information society is defined as a society in which the process of computerization provides people with access to reliable information, saves them from routine work, provides a high level of automation. In this case, the product becomes more "information capacious" (it will keep a higher share of innovation, design, telecommunications and information processing capacities). The technological background of the emergence of information society was the invention of the microprocessor technology and a personal computer, networking and communications.

So, educational establishments must not only keep up with the demands of a society, but also to be proactive. The main objective of universities is to train specialists who can live and work in the information society and have highly developed skills in computer technologies. The introduction of computerization in the learning process takes place in three stages [1: 277].

The first stage provided computers to be used solely as an object of study as new technical means for science lessons. Access to computers was limited to a small number of teachers who were specialists in programming and information science. The second stage contemplated using computers during other lessons and in most cases on the basis of specially developed training programmes.

The third stage gave a significant expansion of the scope of personal computers to solve various problems of education quality management.

Computer-based training technologies, as well as computer programmes have varying degrees of complexity and involvement in the learning process. O.I. Agapova, O.A. Krivosheev, A.S. Ushakov identify three levels of computer-based training technology. According to them, "computer technology is a combination of methods, forms and means which influence a human being in the process of development. Educational technology is built on the basis of certain content and must correspond to it. It involves the use of appropriate methods of presentation and assimilation of different types of knowledge with the help of modern computer technology " [1: 278].

Computer technology is the first generation stores in its basis traditional forms and methods of teaching. Reliance is placed on the classic textbooks, but to improve the way of presentation of knowledge and gain control over its mastery we may use a computer.

Computer technology of the second generation was based on the traditional content, which does not use systematic combination of classic and modern forms and methods of teaching. It is supported by traditional textbooks, reference books and teaching aids, as well as advanced computer programmes and educational environment, which were oriented to the processes of a comprehensive study of models of the real world.

Computer-based training technology of the third generation is a unified educational process based on the interdisciplinary non-traditional content, forms, methods and means of education. Computer becomes the most important element at the third stage.

In the long term, according to experts, a classroom should be a laboratory full of computers, audio and video, creating a possibility to work both individually and in small groups. Telecommunications will allow students to use an extensive database, to get in touch with other educational establishments nationally and internationally and to get access to the world famous libraries and information centres.

The teacher's role will be to assist and manage the educational process in its entirety. Recently the developers of computer-based learning technologies have great hopes for the development and practical application of multimedia programs.

The quality and level of their development is largely dependent on the level of creativity of developers, that is, lyricists, artists, experts in video and audio, programmers. In addition, they should possess knowledge in the theory and practice of teaching.

During their classes students can get information from newspapers, television and will be able to interview, write essays, present shows with the help of multimedia computer-based learning technologies. By doing so, they will not only learn the subject well but also will develop their creativity, communication and organizational skills. A unique opportunity to promote and maintain a high level of interest and cognitive development of students will create potential through continuous updated form and methods of teaching.

The forms of organization of multimedia technology in learning process are immense. These may include teleconference, business case-studies, fairs of student creativity, intellectual debates, discussion clubs, etc. As it can be seen from the list of possible forms of multimedia technology, the teacher should not only possess knowledge of computer software, but also have high teaching skills, general cultural background and a high level of creativity. However, the computerization of education still has many unsolved problems of teaching:

- complete implementation of general computer training, selection and design of educational material in accordance with the principles of didactics and specific to the subject;
- the use of computer technology in management and research activities in the field of education;
- solving complex problems directly related to enhanced computer-based learning [1: 281].

The stage which goes prior creating the system of information technology in learning process is the determination of classification criteria for the identification of specific software products and preference on strategy selection.

On the basis of these conditions we recommend the following as conceptual classification features:

1. Didactic orientation.
2. Software implementation.
3. Technical assistance.
4. Subject area of application.

Let us consider classification by didactic orientation. There are several approaches to the classification of components of software and hardware for the didactic orientation.

For example, it is proposed to classify knowledge transferred to students using a computer in the following way: first, there was a division of knowledge into explicit (articulated) and implicit (non-articulated).

Articulated part of knowledge is the knowledge that can be easily structured and can be transmitted to a student with the help of pieces of information (text, graphics, video, etc.). Non-articulated part of knowledge is the component of knowledge which is based on experience, intuition, etc. This part of knowledge covers abilities, skills, intuitive images and other forms of human experience that can not be transferred directly to the learner. This part of knowledge is received by a student in the process of independent cognitive activity while solving practical problems and tasks. Having this classification of knowledge we can classify educational programme complexes. Technologies that are the basis of the above-mentioned systems and which are used to support the learning process of the articulated part of knowledge are declarative. These will include:

- computer tutorials;
- training database;
- test and control programmes;

- other computer tools to store, transmit and validate training information for educational purposes.

The technologies used to create training programmes that support the process of development of non-articulated part of knowledge are procedural. Information technologies of this class do not contain and do not verify knowledge in the form of pieces of information. They are built on the basis of different models. In this case, they include:

- application packages;
- computer simulators;
- laboratory courses;
- software for business case-study;
- expertise and training systems and other computer tools that allow students receive useful information during the investigation of the subject area under study [2: 80].

There is another approach to the classification of the didactic orientation, that is by the type of training. In this case, information training technologies are also divided into two classes:

- systems of programmed instruction;
- intelligent tutoring systems.

Systems of programmed instruction involve students into getting pieces of information (text, graphics, video depending on technical capacities) in certain sequence and provide control of the assimilation of the course at the points defined by a teacher.

Intelligent tutoring systems differ by the following characteristics as adaptation to the student's knowledge, flexibility of the learning process, selection of optimal educational impact, determining the causes of student mistakes. In intelligent tutoring system knowledge is presented in the knowledge databases containing procedural and declarative component.

They are the following:

- the knowledge base of students;

- evaluation of a student's knowledge and the type of project;
- the procedure to form new projects.

The training model is continuously updated during the training process in accordance with the changes reflecting student's performance.

The division of technology development of software into systems of programmed instruction and intelligent tutoring systems can not be strict as both systems may include elements of both.

For the implementation of the intelligent tutoring systems, the following means are used:

- expertise systems;
- hypertext systems;
- geographic information systems;
- multimedia systems;
- case-study oriented systems;
- animation.

The above mentioned separation of technologies of computer training into procedural and declarative, as well as intelligent tutoring systems and systems of programmed instruction derive from the dividing the learning objectives into two classes:

- training the use of specific methods in practice, obtaining and systematization of various data;
- training students to analyse information and its systematization, creativity and research.

Systems of the second class can be used to design courses which are more complex than the systems of the first class. With their help one can teach processes of synthesis, analysis, comparison, analogy, deduction, induction, etc. Both classes of these technologies complement each other.

The following sub-classification of information technologies in education according to didactic orientation is formed on the basis of organization of educational process.

Intelligent tool systems are based on the latest achievements in artificial intelligence and are advanced to develop computer applications designed to problem-solving approach to learning. Traditional tools can be divided into universal and specialized. Universal tools should provide the following functionality:

- input and analysis of the responses;
- formation of logical structure of computer-based training programs;
- support and formation of text and graphic material;
- ensuring the dynamics of images;
- mathematical modelling with visualization of results;
- the organization of hypertext structures;
- the collection and processing of statistical data;
- formation of rated level of knowledge;
- the ability to work in a local area network;
- the functioning of the applied computer training programs in off-line mode;
- sound assistance;
- support of video streams.

Specialized computer-based training programs, depending on their purpose are:

- hypertext and hypermedia are software systems with the capacity to work with fragments of text, sound, graphics and video, with the presence of different ways to find information, and navigation with the multi-screen mode of operation, with the introduction and preservation of comments, bookmarks, interaction with the outer environment;

- modelling software packages of applied software are used for software development and modelling of various processes and objects of physical nature, and also for creation of a variety of computer simulators, including real-time scale;

- programmes for the control of knowledge and testing if the tests are in the form of a set of interrelated tasks of increasing complexity with a wide manner of presentation tasks, with full range of analysis and input of keys which provide collection and processing of individual and group statistics about the results of monitoring and the possibility to work in computing networks;

- support of the lecture material with the possibility to connect dynamic images, audio material, etc.

Selecting the version of classification of information technologies according to the didactic orientation depends on the specifics of the educational establishment and the achieved level of informatization of the learning process.

Software implementation classification. Hardware and software systems can be divided according to:

- the type of tool to create, that is, training programs for various purposes are created by different tools for programming on a high-level language (object-based, using author's tools);

- the type of operating environments;

- the basis of the network, i.e. individual (a personal computer) or group (local or wide area network) which is involved in acquiring knowledge.

Classification according to the type of complex technical assistance. Technical policy in the hardware/software implementation of informatization of educational process is not only the prerogative of a single institution, but also the education system as a whole, as a centralized procurement of information and computer technology is now very successful.

Classification according to subject area of applications is carried out by educational institutions independently on the basis of classic division of subject areas for scientific, general vocational, technical, humanitarian and special [2: 81].

Using the above-mentioned technologies in teaching process, we will immerse the student into the information environment. The concept of "information environment" combines two terms: "environment" and "information".

Hence, it is used to denote extensive, structured, and, most importantly, coordinated, interacting objects. Information environment is not only a conduit for information, but also active principle acting on its participants, and human activity in this case is a part of the communication process. Thus, the information infrastructure created by the society which allows implementing the communication activities on a

scale appropriate to the level of development of the society, consists of publishers, libraries, information centres, data banks, the media, etc.

The concept of information environment is not identical to the notion of the information medium: the one which exists in the same information space, the individual can move from one environment to another. These transitions occur within a single information space. The singularity of the information environment is that any information environment provides an opportunity to obtain necessary data, information, hypotheses, theories, and also the ability to receive information and convert it in the learning process [3: 59].

The usage of the technologies in teaching and control of knowledge will undoubtedly draw the interest of students to the subjects, give a positive effect on the assimilation of new material, reduce the complexity of work of a teacher and thus free up time for creative work and scientific activity.

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INFORMATION ABOUT THE AUTHOR

***Mytsenko Valeriy Ivanovych** – candidate of pedagogical sciences, Dozent,
Head of Foreign Languages Department of Kirovohrad National Technical
University.*