Original Article

Methodology of Using the Opportunities of Virtual Technologies in the Educational Process

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Abstract

Nowadays the content and purpose of education are changing in accordance with the requirements for personnel in society. It is also required that the recipients of education have a high level of competence, as well as modern knowledge. At the same time, along with modern teaching methods, the effective use of technological means is important. Virtual learning technologies are becoming an important factor in solving the educational problems we face today. In the course of our research, methodological aspects of training future specialists in the use of virtual educational technologies were investigated and recommendations were developed.

During the research, the methodic features of teaching how to use virtual technology, for future specialists have been studied and recommendations have been created.

Keywords: Virtual Education, Virtual Education Technologies, Modern Education Methods, Competencies, Competency based Approach to Education.

INTRODUCTION

In the second half of the XX and the beginning of the XXI centuries, as a result of the development of computers, didactic tools in a new form began to be used in the education system. The learning tools developed on the basis of computer technology capabilities are called virtual learning tools. At the same time, the main goal is to achieve high efficiency in the development of students. It is known that when a person reads the source – 10%, when he hears – 20%, when he sees the process – 50% remembers the amount of information. As a result of the capabilities of modern computer technologies, virtual technologies enable students to virtually analyze the object of training.

AIM OF THE RESEARCH

To study the methodological foundations of the use of virtual educational technologies in the process of acquiring modern knowledge and competencies by students. Improve the process of training future specialists in virtual learning technologies, study their problems and develop recommendations. Development of recommendations for the effective use of modern teaching methods and tools.

RESEARCH METHODOLOGY

The necessary didactic means of organizing training in the educational process are selected taking into account such factors as the purpose of training, content, type of training. It is important to identify the factors that need to be taken into account in this process and use the right tools. In the course of the study, methods of observation, comparison, experiment and generalization were used.

THE RESULTS OF THE STUDY

Virtual learning is usually associated with online courses or online environments, but has a much broader scope. Also, the most common forms of virtual learning, through which the organization of the educational process is carried out precisely with the help of information and communication technologies.

Virtual learning can be considered as an organization based, in addition to educational organizational facilities, on the use of

computer technologies and the Internet, virtual audience and virtual reality technologies. In this process, students often team up with the audience in an online environment or train individually. When learning activities are carried out online, the student and the teacher are physically separated, depending on the place, time, or both.

Virtual learning is the process and result of communicative interaction of subjects and objects of education. Virtual learning is available to everyone, and classes allow you to be anywhere and at a time convenient for you. As a result, you choose the time of classes yourself, and classes are free.

To date, it is noted that modern teaching staff, along with their professional knowledge, can effectively use the possibilities of virtual educational technologies.

Virtual learning technologies are widely used in education based on a competence-based approach. Competence-based education is considered as an approach aimed at rethinking and changing traditional ideas about what, when, where, and how a student learns and acquires academic knowledge and skills.[1]

The new economy is the economy of customers-users, therefore, the main factor in the development of the global information and telecommunications industry has become the provision of a new generation of services on a large scale.

Among such urgent tasks are the development of fundamental mechanisms for the integration of education with science and industry, their implementation in practice, individualization of education, independent distance and virtual education system, development and development of knowledge acquisition technology, acceleration of student learning using e-learning based on new pedagogical and information technologies.

The introduction of virtual educational technologies into the process of formation of methodological training of pedagogical personnel in preparing them for innovative pedagogical activity will pave the way for increasing the effectiveness of this process.

Currently, with the use of modern pedagogical and information technologies in the educational process of higher education, teaching materials are also divided into two types.

This is a complex of traditional and educational materials of a new generation.

The traditional teaching materials include textbooks, manuals, methodological guidelines, didactic handouts and visual materials used in the education system.

In addition to traditional materials, new teaching materials may include electronic publications, electronic textbooks, electronic posters, electronic dictionaries of methods based on modern information and pedagogical technologies, educational materials created using interactive methods, multimedia tools, information from the Internet and other visual and technical means. Currently, the need for a new generation of educational materials is increasing, while the importance of the traditional complex of educational and methodological materials is not decreasing.

The use of innovative methods to increase the effectiveness of the computer science lesson the use of virtual educational technologies in the educational process pursues the following didactic goals:

- Orientation of the educational process on the individual, increasing the effectiveness of its acquisition of knowledge, skills and abilities defined by the state educational standard;
- Improvement of professional and pedagogical readiness, methodological readiness of pedagogical personnel, their preparation for innovative pedagogical activity;

Improving the effectiveness of the lesson in teaching computer science and information technology, the use of virtual educational technologies, ensuring active participation in training based on innovative technologies and creating the basis for the acquisition of methodological knowledge, skills and abilities necessary for the use of innovative technologies.

The implementation of the above didactic goals necessitates the professional training of future computer science teachers, the improvement of their methodological training, the use of virtual educational technologies in teaching “computer science and information technology” in secondary schools in order to increase the effectiveness of the lesson.

This requires the use of virtual educational technologies in the formation of methodological training of future computer science teachers, improving the effectiveness of the educational process, preparing them for innovative pedagogical activity.

Therefore, the use of virtual educational technologies in improving the effectiveness of a computer science lesson in the context of innovative technologies, it is necessary to make certain changes to the components of methodological training of a computer science teacher, update its content, and develop ways to use virtual educational technologies in improving the effectiveness of a computer science lesson.

The advantages of the educational and methodological support being created, aimed at solving issues of improving the quality of the educational process through the development and use of virtual educational technologies in teaching computer science and information technology, can be scientifically substantiated, and the results of the application of this educational and methodological software in practice can be analyzed in a test mode.

A virtual educational space is a space in which a student who is widely spreading in the outside world and using his emotional, emotional-intellectual and intellectual abilities can discover his external spheres through his activities.

Virtual Learning environment

It includes information content and communication capabilities of local, corporate and global computer networks organized and used for educational purposes by all participants of the educational process;

Created and developed for effective communication of all participants of the educational process;

Unlike traditional teaching methods, learning has the character of communication, indirect, both remote and traditional, "face to face".

Virtual educational environment, parameters

- Presence of thoughts (level of interactivity);
- An abundance of response capabilities of various nature;
- Linguistic diversity (means of expression);
- Individual orientation.

Virtual educational environment (technologically), the information space of interaction of participants in the educational process, which allows managing information and communication technologies, including computer equipment and complexes, the educational environment and communications of participants.

Virtual educational environment (in the organizational and communicative aspect) is a complex self-reflective change in behavior, behavior of participants in the communicative process in relation to a changing situation) and self-improvement (represents the gradual formation of an effective relationship of the educational process, the relationship between the student and other participants in the educational process.

The virtual educational environment combines a fast-growing, multi-level and multifunctional system:

1. Innovative and traditional technologies characteristic of the interaction of participants in the educational process within the open model of asynchronous individual learning;
2. Information resources: databases and data, libraries, e-learning materials, etc.;
3. Modern software: software booths, electronic communication.

The virtualization of the educational system is based on a technologically informed approach, which consists of virtual information space, virtual educational models, virtual educational technologies, virtual information structures and information effects.

These components represent new educational technologies as an integral part of virtuality. Virtual modeling and virtual technologies create new factors for the connection of visual images with objective reality, which are characterized by such factors as the scale of space, time scale, time inversion, modeling of unrealistic situations. The emergence of information models that include a large information capacity has created additional opportunities for virtual learning.

In higher educational institutions, future specialists are offered the module “virtual educational technologies”, on the basis of which students are provided with knowledge on modern virtual educational technologies.

The purpose of the module "virtual educational technologies": new multimedia tools and technologies in the process of training, retraining and advanced training of future teaching staff, technologies of virtual presence in the educational process (virtual laboratory, simulators, virtual travel, etc.).the use of mobile educational technologies, the Internet and social networks, their capabilities and security, as well as providing and improving knowledge about open educational resources and their capabilities.

Competencies for access to virtual learning technologies require that students first of all have basic competencies in the subject area. These competencies are encouraged by the principle of consistency based on the following stages:

The first stage. Competencies for working with information. Students are stimulated with knowledge and practical skills in the field of information, its types and properties, concepts of information and information, technologies for searching, storing, processing and transmitting information.

The second stage. Competencies in the field of computers, technical devices, software tools for working with information and their use are stimulated.

The third stage. Internet technologies and competencies for their use are encouraged.

The fourth stage. Competencies for working with virtual technologies are stimulated on the basis of the module "virtual learning technology". These competencies are as follows:

- Work with multimedia tools, software and multimedia products;
- Gaining knowledge about the virtual educational environment and tools;
- Work with systems that control the virtual learning process;
- Organization of the educational process based on 3D technologies in an online environment;

- The ability to use mobile learning technologies;
- Be able to work with the Internet and social networks, their capabilities and security requirements;
- Access to open educational resources and their capabilities;
- Effective use of educational programs and training and technical means on the subject related to the field of activity and taught;
- Acquisition of knowledge, skills and abilities for the targeted use of information and communication technologies used in the educational process.
- Possess such competencies as improving professional activity and labor productivity, the use of information and communication technologies in the implementation of innovations in teaching practice.

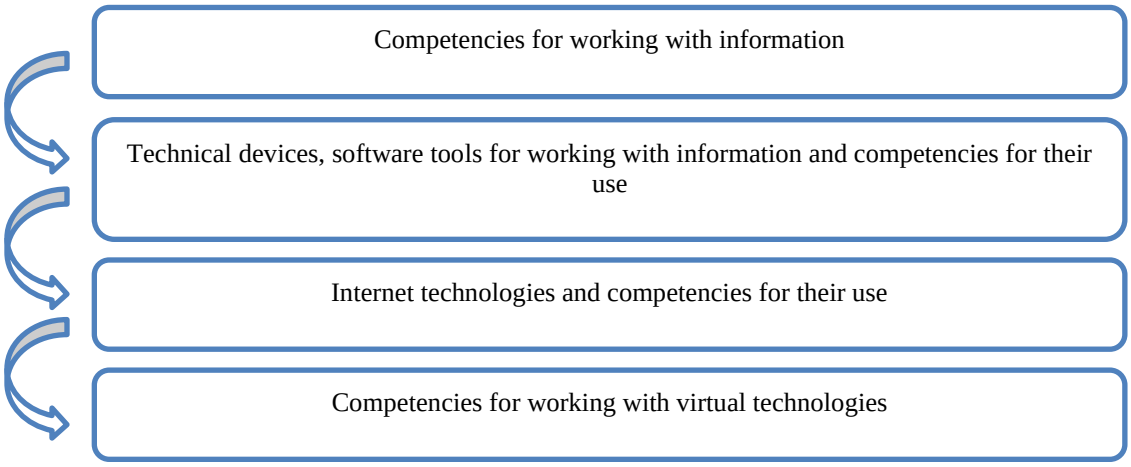

Figure 1. Stages of development of competencies for working with virtual technologies

While investigating the issue, it was determined that the use of virtual learning by developers during training, technologies used to improve professional qualifications, will lead to the following increased efficiency:

- Companies with a high level of development of the use of virtual learning in the acquisition of knowledge. The average level of knowledge of an employee directly affects the speed and safety of work;
- Institutions where work is carried out online via the Internet. The choice of the course of interest, the timing of classes with teachers, the possibility of passing control and control work;
- Carried out using the Internet. Educational institutions where there are several forms of education. Some universities offer courses in the virtual world that will always be of interest to the student.

In the course of our research, criteria were developed for assessing the knowledge and skills that future specialists should acquire within the framework of "virtual educational technologies" as a result of mastering the module "virtual educational technologies", namely:

Table 1. Assessment criteria of the knowledge of intending specialists in "virtual educational technologies"

European Credit Transfer and Accumulation System (ECTS)	By the national assessment system based on 5 points	Assessment criteria
A	5	• Has in-depth knowledge of the multimedia concept and its tools; • Has an idea about multimedia software. • Multimedia carriers. CDROM, CD, DVD, HD DVD, Blu-ray. Multimedia file formats. Application of multimedia. Media industry. Audio files. The method of storing files. Audio and video editing. Multimedia electronic publications (educational films, electronic textbooks). 3D technologies, skills of working with a virtual creature; • Has the skills to work with multimedia applications; • 3D technologies. Has the skills to work with panoramic animation. • Virtual learning environment. Virtual learning systems. The main functions of LMS systems, analysis of LMS systems, software packages that enable the

		organization of the virtual educational environment process, have an idea of the functions of LMS, LMS, Moodle, Atutor, Claroline, OLAT, Efront, Sakai, Doceos, Chamilo, ILIAS, LAMS, Open Elms; • **Has an idea of application, such as: Crocodile Physics, Crocodile Technology, Crocodile Chemistry, Crocodile ICT;** • Work with a virtual learning environment; have skills. • In the process of learning has the ability of using simulators. Has the skills to create panoramic images; • Learning to work with the system interface that controls the virtual learning process. Pedagogical design of educational resources for creating a course in a virtual learning process. Creating training courses with their help. • Has the skills to work in a virtual environment; • Has knowledge of the systems that control the virtual learning process;
B C	4	• Has in-depth knowledge of the multimedia concept and its tools; • Has an idea about multimedia software. • Multimedia carriers. CDROM, CD, DVD, HD DVD, Blu-ray. Multimedia file formats. Application of multimedia. Media industry. Audio files. The method of storing files. Audio and video editing. Multimedia electronic publications (educational films, electronic textbooks). 3D technologies, skills of working with a virtual creature; • Has the skills to work with multimedia applications; • 3D technologies. Has the skills to work with panoramic animation. • Virtual learning environment. Virtual learning systems. The main functions of LMS systems, analysis of LMS systems, software packages that enable the organization of the virtual educational environment process, have an idea of the functions of LMS, LMS, Moodle, Atutor, Claroline, OLAT, Efront, Sakai, Doceos, Chamilo, ILIAS, LAMS, Open Elms; • **Has an idea of application, such as: Crocodile Physics, Crocodile Technology, Crocodile Chemistry, Crocodile ICT;** • Work with a virtual learning environment; have skills. • In the process of learning has the ability of using simulators. Has the skills to create panoramic images;
D E	3	• Has in-depth knowledge of the multimedia concept and its tools; • Has an idea about multimedia software. • Multimedia carriers. CDROM, CD, DVD, HD DVD, Blu-ray. Multimedia file formats. Application of multimedia. Media industry. Audio files. The method of storing files. Audio and video editing. Multimedia electronic publications (educational films, electronic textbooks). 3D technologies, skills of working with a virtual creature; • Has the skills to work with multimedia applications; • 3D technologies. Has the skills to work with panoramic animation. • Virtual learning environment. Virtual learning systems. The main functions of LMS systems, analysis of LMS systems, software packages that enable the organization of the virtual educational environment process, have an idea of the functions of LMS, LMS, Moodle, Atutor, Claroline, OLAT, Efront, Sakai, Doceos, Chamilo, ILIAS, LAMS, Open Elms; • **Has an idea of application, such as: Crocodile Physics, Crocodile Technology, Crocodile Chemistry, Crocodile ICT;**
FX F	2	• Has in-depth knowledge of the multimedia concept and its tools; • Has an idea about multimedia software. • Multimedia carriers. CDROM, CD, DVD, HD DVD, Blu-ray. Multimedia file formats. Application of multimedia. Media industry. Audio files. The method of storing files. Audio and video editing. Multimedia electronic publications (educational films, electronic textbooks). 3D technologies, skills of working with a virtual creature;

Various assessment tools and methods can be used to assess knowledge based on the above criteria. We recommend using mixed learning technologies in this [4].

CONCLUSION

As a conclusion, it should be noted that in the course of our research, the following disadvantages are allowed in the process of providing students with knowledge about virtual technologies:

- Providing knowledge directly about virtual learning technologies without first studying the level of knowledge of students;
- Knowledge in the field of virtual technologies is provided without the presence of basic competencies, such as skills and qualifications for working with Internet technologies.

The above disadvantages negatively affect the quality of education. This is necessary for troubleshooting. First of all, it is necessary to pay attention to the consistency and continuity of training and use modern educational technologies.

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