DISTANCE EDUCATION: THE INTRODUCTION OF NEW COMPUTER TECHNOLOGIES IN THE LEARNING PROCESS

INTRODUCTION

Modern information technology means have taken a significant role in human life, including in the field of education. The development of information technology and telecommunications has led to the emergence of new forms of education and training. Distance learning has become one of the most popular forms. Distance education allows, on the basis of multimedia in the process of acquiring knowledge, to analyze the student’s personal qualities, the level of his knowledge, and also provides the personalization of learning. The possibility of implementing the learning process without interrupting professional activity and the independence of the student from the location of the educational institution have significantly increased the role of this form of education. Such training is most relevant and in demand among socially unprotected segments of the population and those for whom separation from the main activity is not possible (disabled people, military personnel, housewives, etc.). Territorial and temporal independence, the possibility of real immersion of students in the information technology educational environment through the use of multimedia in the learning process led to both the widespread distribution of distance learning and the need to study and understand the educational tasks arising in its course. It is especially important to solve the problems of distance learning in relation to university practice.

Distance learning has shown a high degree of adaptation to both the specifics of group and individual learning. Currently, distance learning technology is gaining more and more popularity, known as e-Learning - (as defined by the European Commission) - the use of new multimedia and Internet technologies to improve the quality of education by improving access to resources and services, as well as remote knowledge exchange and teamwork. Thus, the development of distance education is inextricably linked with the introduction of new computer technologies into the process training, in particular, multimedia systems, and in the context of e-Learning - distance multimedia training systems. Remote multimedia learning systems are integrated learning systems for the educational process based on multimedia and telecommunications.

Currently, the most developed and widespread are distance learning systems focused on natural science and technical areas of study. The largest number of distance learning courses for universities have been created and implemented in the field of information and communication technologies, management, and foreign language learning. At that

At the same time, today the processes of development and application of distance multimedia teaching systems in the educational process in creative areas of education do not meet modern requirements in terms of their pace and scale. This is especially true for higher humanitarian education, which, in contrast to the university training of technical specialists’
profile, is to a much lesser extent equipped with the technical and human resources necessary for the creation of remote multimedia training systems. As a result of this, to date, in the training of specialists in humanitarian specialties, distance educational technologies have not yet been widely used.

The greatest difficulty in creating distance multimedia training systems for creative areas of education is the development of automated control in the implementation of professional competencies of students. In the educational technologies presented on the market for distance multimedia training systems, there is no automated control of the performed creative tasks, and, therefore, there are no evaluative means of educational results. Typically, practice is assessed remotely and "manually", with the help of feedback from a mentor or mentor and a trainee, which significantly increases the time for checking and evaluating creative practical tasks. (IASECHKO, M., IASECHKO, S., SMYRNOVA, I., 2021).

THE INITIAL PRESUPPOSITIONS

In the article, the following research methods were used to solve the set tasks: theoretical (study and analysis of scientific and pedagogical, psychological and pedagogical, reference, specialized literature, regulatory documentation on the topic of research, additional professional advanced training programs; analysis, comparison, classification of the information received and generalization); empirical (pedagogical experiment, observation, questionnaire survey, survey, conversation, testing); mathematical (statistical data processing).

METHODS

Innovative processes in modern education are aimed at the formation of independent cognitive activity in students. Modern interactive technologies have contributed to the development of distance education, and thanks to the creation of multimedia learning systems, the process of independent education is becoming not only affordable, but also exciting, because multimedia systems are created at the intersection of many knowledge and areas. Modern remote multimedia the training system is a synthesis of vivid sound-visual images, animation, video, practice-game component, etc.

Education is focused on a person-centered approach; the main task becomes the need to prepare students for subsequent independent learning, life, work, outside the mentor, teacher, etc. Stimulating creativity creates a new space for the formation of a wide range of skills. There is an accumulation of life experience and a mobilization of knowledge, contributing to the knowledge of new things.

Distance education provides new opportunities for the consumer, for example, the opportunity to study international programs, including MBA. The world’s leading universities offer distance learning of their programs, their various versions in different languages of the world. Today you can get a diploma from these universities, I study in my country at home, in convenient mode. Many universities are trying to use the resources of satellite communications in order to broadcast their programs to countries in need and lagging behind; main areas for learning are IT technologies, management, multimedia, computer mastering and more.

Distance education in creative professions is dual in its development. Technological progress has reached a high level, but the question of whether the computer is able to appreciate creativity is highly controversial. Of course, the algorithms of modern machines, artificial intelligence, neural networks are capable of high performance in any area, but the issue of ethics in assessing the quality of creativity is too complex and contradictory. It is important to note the pluses that distance education has generated (HARRIS, S., SUTTON, R., 1986):

- **Mass distribution.** At the same time, the same course may be available to thousands of students from different parts of the country. The globalization of distance education makes it possible to transfer the accumulated experience and knowledge. Databases are being created everywhere that can be accessed without restrictions. Using the accumulated experience, based on the experience of many generations,
multimedia has allowed this knowledge to be translated into data libraries that can be accessed around the clock learners.

- **Access to electronic databases.** This characteristic is one of the key factors in the development of computers. The more information is uploaded to the network, the smarter computers become.
- **Distance education forms a new unified learning environment.** Examples include online universities that integrate many taps, programs, systems, and more.
- **Open borders.** Distance education is not tied to a territory or location.

The first chapter focuses on the constituent aspects of learning systems. Adaptive multimedia systems have more learning opportunities. The ability to customize the system for the student’s personal qualities allows the system to be used by a wide range of users. This property of the system makes it possible to consider the interests of the student, his level of knowledge, thanks to the adaptability of multimedia technologies and the structuring of information. Consistent presentation of information, interactivity, test and practical components are able to interest the user to a greater extent, improve communication.

An important property that contributes to the popularity of the use of multimedia systems for teaching is the property of interactivity. Interactivity refers to the level of interaction between the system and the student. Interactivity allows the student to enter into an active learning process in the system, thereby creating a dynamic dialogue process. Thanks to the interactive possibilities of interacting with the system, involvement in the learning process increases, the motivation of the student grows, the development of creative thinking rises, and the student’s creative potential is formed. On the psycho-emotional level, interactive interaction allows the student to experience success (BOGOMOLOV, 2007). These positive properties are not the only ones that can be distinguished; so, it should be noted that:

Distance learning contributes to the organization of the student's independent work, which determines the formation of new personality traits, the acquisition of important skills and contributes to the development of motivation and cognition. A student studying in the distance education system works individually with an automated system, analyzes the material received, makes notes, solves problems and exercises; in the case of the envisaged connection with the mentor, all work is structured in such a way as to stimulate the student independently advance in the subject of study, overcoming tasks. Students develop critical and creative thinking. (IASECHKO, M., IASECHKO, S., SMYRNOVA, 2021).

When technology is available to the student, it is easy to check the reality of facts or prove them, look from different angles and draw their own conclusions. Such achievements are essential for understanding responsibility in their professionalism and future professional growth. This will allow a competent orientation in innovations and will also serve to acquire the skill of flexibility in accepting new things.

Along with a large list of advantages that distance multimedia learning systems have, it is important to highlight the list of current disadvantages.

One of the main disadvantages is there is no contact with the teacher; for many students, it is the energy and importance of the teacher that becomes motivation, and without emotional stress they lose interest in the subject, or at the first difficulty they give up.

Self-discipline is a factor that must be overcome students when there is no supervision of a mentor or teacher. Responsibility for educational activities, acquisition of knowledge and skills lies with the student.

**As a rule, students feel a lack of practical training.** Training in the system is very often based on theoretical materials, and the studied material is not practiced.

**Knowledge control system problems.** Also a global lack of distance learning. Lacking a system for assessing practical assignments, the system, in fact, does not correspond to the
basic norms of teaching. At the moment, not all academic disciplines can be studied using a computer in full autonomously.

**User authentication problem.** There is a high probability that the wrong person may be on the other end of the computer since the program does not require confirmation of video or biometric data.

**Development of training systems.** Today, this problem is due to two aspects: high cost and complexity of development. There is also a lack of funds allocated for the development of these technologies. Learning systems are not financed in full, due to the mistrust of investors and the state, but every year this situation changes and the perception improves e-learning (IASECHKO, M., IASECHKO, S., SMYRNAOVA, I., 2021).

The pros and cons of modern distance learning are due to the development of information technology. The high cost and technical complexity of the implementation of modern remote multimedia educational systems has a particular impact. But it should be noted that technology has had a strong impact on online learning. For example, VR and AR (virtual and augmented reality) gave birth to the concept of ALGAE (Adaptive Learning GAme dEsign) - adaptive educational game design. The use of educational games allows you to develop the direction of adaptive learning, since during the game the development of abilities and knowledge is significantly increased. The high level of implementation of ALGAE is demonstrated by many educational role-playing games.

Such projects show a striking trend towards convergence of real and virtual environments, the reason for which lies in the emergence of new multimedia technologies and tools. Replacing the traditional interaction with a computer by means of graphical interfaces with virtual reality, another principle of communication is formed, in which virtual objects materialize and act as controls, obtaining physical characteristics and properties comparable to the real environment. Organized in this way, human-machine interfaces make it possible to create interactive learning virtual spaces that act as simulators, simulating learning situations as close as possible to reality (POLAT, 2021).

**RESULTS AND DISCUSSION**
Distance education is rightfully considered a promising area of development in the field of educational services, responding to the main population needs, quality and level of education. The variety of forms of implementation guarantees wide coverage and popularity:

- Distance education is a popular form of education in modern society;
- Distance education has embodied what makes this area extremely attractive: accessibility, mobility, economic benefits.
- Distance education meets a number of criteria that make this area unique and popular.
- Flexibility and adaptability of training settings, an individual approach, the development of creative and creative thinking.

The multimedia component of modern distance learning systems provides a high level of knowledge assimilation through the synthesis of means of influencing human perception: audiovisual, dynamic content, etc. Multimedia is of decisive importance in the choice of a training system, offering advanced methods: VR and AR technologies, simulators, simulations, virtual forms of information - all this is the prospect for the development of distance multimedia learning systems.

Distance learning meets the strategic objective education in the framework of the direction of individual independent educational activities. This approach is considered appropriate for the growing type of society and the best development of the individual (IASECHKO, KHARLAMOV, SKRYPCHUK, FADYEYEVA, GONTARENKO, SVIATNAIA, 2021).

It was proposed to pay attention to the inclusion of a number of specialists in the development team, without whom it is difficult to imagine a full-fledged team today. These specialists include:
• Facilitator (curator), moderator, consultant, or invigilator. Each specialist has his own function of assistance in the learning process.

• Game engineer. This is a director who simulates situations, actions for a user or a group of users. Using game situations, the program allows you to determine the resources and capabilities of the user in a particular case.

• Educator. On the shoulders of the teacher lies the preparation of relevant information, which must be processed for effective delivery to the virtual space of the network.

• Designer. Responsible for the creation of a unified consistent system of information perception and the convenience of a virtual journey through the training system. It is the designer who carries out the work of combining theoretical materials into fascinating interactive data, creates a shell of an intuitive interface that allows the end user to effectively interact with the system.

• UX / UI specialist. The UX / UI specialist thinks over not only the algorithm for how the user will interact with the system, but also determines how these steps might look. It is the UX / UI specialist who is assigned the task - the interactivity of the system.

• Game interaction specialist. Develops a script for submitting materials. Multimedia content has many forms of expression: text, graphics, infographics, 3D graphics, videos, simulation programs, etc. Interaction specialists work proactively, they analyze user behavior and predict options for his interaction in the training system.

• Linguist. The task of the linguist is to provide the system with those unique language data necessary for the operation of the training system.

• Programmer. The work of the programmers is an important final step, but, in fact, maintaining the system constantly requires the work of all members of the development team (IASECHKO, SHELUKHIN, MARANOV, 2021).

So, teachers should monitor the relevance of information in the system, its adapted form for assimilation, designers should analyze the degree of work with students' materials, determine ease of use material and interaction with the system, and programmers must optimize the system, make it fast and responsive.

An important part of the research is devoted to technologies and their application in distance multimedia learning systems. It is by relying on knowledge about technology that it is possible to automate the process of teaching creative specialties, in particular graphic design, as well as reviewing graphic works in the learning process. Current technologies, such as machine learning, neural networks, etc., may ensure the functioning of automatic reviewing of graphic works of students studying in remote systems in the future, this is a question for the foreseeable future. Neural

Machine learning networks are already used in various fields, most actively used in the field of data science. Such a subsection of machine learning as Big Data clearly demonstrates how neural networks cope with the analysis of large amounts of data. Neural networks stage-by-stage distribute the process for working with large amounts of information. Object recognition principle:

• image definition;
• distribution of the image into points (pixels);
• connecting points in a line;
• construction of simple shapes from points and lines;
• composing complex objects from shapes, points and lines, etc.
• Machine learning can guarantee the creation of such an automated program that will be able to analyze and present data from the analysis of creative work according to compositional laws, based on the Big Data work system.
The development of this research depends on the constant replenishment of the pattern recognition system, the automated assessment system with high-quality, structured, labeled data. Neural networks are the cutting-edge technology for the advancement of this research. But do not forget that, in addition to constant and deep "learning" of computer programs, it is necessary to shift the focus of attention towards uncontrolled teaching methods that should mimic human behavior and thinking.

**CONCLUSION**

Defining the basic principles of development and the distribution of responsibilities between the development team, which should work in tandem at all stages of development, will allow the creation of full-scale training systems targeted at a wide range of users. A clear process of interaction of methodology and technology on the way of developing distance multimedia training systems will increase the level of efficiency, speed of development, with a competent distribution of competencies.

Modern information technologies such as pattern recognition systems, machine learning and neural networks are capable of automating complex data analysis and processing. Pattern recognition technology allows the computer to continuously learn and collect data to form the database needed to be able to create an automatic review and grading system graphic images.

The system of automated assessment of graphic images is an important step towards the creation of distance learning systems in the field of graphic design. Computer technologies have made significant changes not only in the educational process, but also in the social, cultural and other spheres of human life. Information systems have become an integral part of human social life in most areas, which has given rise to a new paradigm in society. It is difficult to underestimate the impact of computerization on human life, which over the past half century has become completely different, and its pace developments are constantly accelerating. Education - as the engine of progress and the foundation of the future, demonstrates the guidelines of society, its development and aspirations.

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Distance education: the introduction of new computer technologies in the learning process

Educação a distância: a introdução de novas tecnologias de informática no processo de aprendizagem

Educación a distancia: la introducción de nuevas tecnologías informáticas en el proceso de aprendizaje

Resumo
O artigo define o conceito de sistema de formação multimédia à distância e considera a utilização de sistemas de formação multimédia à distância no ensino superior na área do design; investigou a estrutura e composição de sistemas multimédia de ensino à distância; identificou as características específicas da aprendizagem por meio de sistemas de aprendizagem multimédia à distância; as especificidades da personalização do usuário no espaço multimédia são consideradas; foi desenvolvido um formato para descrever dados em sistemas de aprendizagem multimédia à distância. Os resultados mostram que o sistema de avaliação automática de imagens gráficas é um passo importante para a criação de sistemas de ensino a distância na área de design gráfico.

Palavras-chave: Ensino inovador. Ensino superior. Tecnologia de ensino.

Abstract
The article defines the concept of distance multimedia training system and consider the use of distance multimedia training systems in higher education in the field of design; investigated the structure and composition of distance learning multimedia systems; identify the specific features of learning using distance multimedia learning systems; the specifics of user personalization in the multimedia space are considered; a format for describing data in distance multimedia learning systems has been developed. The results show that the automatic evaluation system for graphic images is an important step towards the creation of distance learning systems in the field of graphic design.

Keywords: Innovative teaching. Higher education. Teaching technology.

Resumen
El artículo define el concepto de sistema de formación multimedia a distancia y considera el uso de sistemas de formación multimedia a distancia en la educación superior en el campo del diseño; investigó la estructura y composición de los sistemas multimedia de aprendizaje a distancia; se consideran las particularidades de la personalización del usuario en el espacio multimedia; Se ha desarrollado un formato para describir datos en sistemas de aprendizaje multimedia a distancia. Los resultados muestran que el sistema de evaluación automática de imágenes gráficas es un paso importante hacia la creación de sistemas de aprendizaje a distancia en el campo del diseño gráfico.

Palabras-clave: Enseñanza innovadora. Educación superior. Enseñanza de la tecnología.