LINGUISTIC SUPPORT AS A KEY ELEMENT IN THE DEVELOPMENT OF DISTANCE MULTIMEDIA EDUCATIONAL SYSTEMS: COMPOSITION AND STRUCTURE

O SUPORTE LINGUÍSTICO COMO ELEMENTO-CHAVE NO DESENVOLVIMENTO DE SISTEMAS EDUCACIONAIS MULTIMÍDIA A DISTÂNCIA: COMPOSIÇÃO E ESTRUTURA

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ABSTRACT

Objective: of the article is distance multimedia learning systems.

Methods: To solve the tasks and test the working hypotheses, the study used a set of theoretical methods and techniques adequate to the nature of the object under study: methods of system analysis, which were used at the stage of identifying the problem area, determining its relevance, setting goals and developing solutions; methods of terminological analysis, which were used in a comprehensive study of various scientific works on the research problem; methods of algorithmization and programming used to develop a data description format; methods of empirical research to obtain data on the functioning of the pattern recognition system and the automated assessment system.

Results: The concept of a distance multimedia learning system is defined and the application of distance multimedia learning systems in higher education in the field of

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design is considered; the structure and composition of distance multimedia learning systems are studied; specific features of learning using distance multimedia learning systems are studied and identified; the specifics of user personalization in the multimedia space are considered; a format for describing data in distance multimedia learning systems is developed; principles of using a didactic model of a multimedia component in the linguistic support of distance multimedia learning systems are introduced.

Conclusion: The definition of the concept of distance multimedia learning systems is given, the relevance of distance multimedia learning systems in relation to the educational environment is analyzed, methods of organizing distance education are studied, the principles of working with the learning system are structured; distance multimedia learning systems, the influence of multimedia on the student are structurally studied, options for the development of e-learning by means of multimedia, virtual and augmented reality, artificial intelligence technologies and neural networks are shown; the importance of independent work both in the multimedia system and for learning in the field of creative areas of learning is determined; principles and stages of creating distance learning complexes are developed, a number of criteria for assessing the quality of learning systems are derived, the importance of developing usability, adaptability and interactivity of the system is analyzed, and the composition of the specialists necessary to improve the quality of developing distance multimedia learning systems in the field of creative areas of learning is determined; principles for creating distance multimedia learning systems have been formulated, a set of linguistic support tools has been proposed: an information model of an image recognition system, an automated assessment model, a data description format has been developed to enable automated monitoring of creative practical assignments of students.

Keywords: Education; Distance Multimedia Learning Systems; Terminological Analysis; Linguistic Support.

RESUMO

Objetivo: do artigo são sistemas de ensino multimídia a distância.

Métodos: Para resolver as tarefas e testar as hipóteses de trabalho, o estudo utilizou um conjunto de métodos e técnicas teóricas adequadas à natureza do objeto em estudo: métodos de análise de sistemas, que foram utilizados na fase de identificação da área do problema, determinação de sua relevância, definição de metas e desenvolvimento de soluções; métodos de análise terminológica, que foram utilizados em um estudo abrangente de vários trabalhos científicos sobre o problema de pesquisa; métodos de algoritmização e programação utilizados para desenvolver um formato de descrição de dados; métodos de pesquisa empírica para obter dados sobre o funcionamento do sistema de reconhecimento de padrões e do sistema de avaliação automatizado.

Resultados: O conceito de um sistema de ensino multimídia a distância é definido e a aplicação de sistemas de ensino multimídia a distância no ensino superior no campo do design é considerada; a estrutura e a composição de sistemas de ensino multimídia a distância são estudadas; características específicas do aprendizado usando sistemas de ensino multimídia a distância são estudadas e identificadas; as especificidades da personalização do usuário no espaço multimídia são consideradas; um formato para descrever dados em sistemas de ensino multimídia a distância é

desenvolvido; princípios de uso de um modelo didático de um componente multimídia no suporte linguístico de sistemas de ensino multimídia a distância são introduzidos.

Conclusão: A definição do conceito de sistemas de ensino multimídia à distância é dada, a relevância dos sistemas de ensino multimídia à distância em relação ao ambiente educacional é analisada, métodos de organização do ensino à distância são estudados, os princípios de trabalho com o sistema de aprendizagem são estruturados; sistemas de ensino multimídia à distância, a influência da multimídia no aluno são estudados estruturalmente, opções para o desenvolvimento de e-learning por meio de multimídia, realidade virtual e aumentada, tecnologias de inteligência artificial e redes neurais são mostradas; a importância do trabalho independente tanto no sistema multimídia quanto para o aprendizado no campo das áreas criativas de aprendizagem é determinada; princípios e etapas de criação de complexos de ensino à distância são desenvolvidos, uma série de critérios para avaliar a qualidade dos sistemas de aprendizagem são derivados, a importância do desenvolvimento da usabilidade, adaptabilidade e interatividade do sistema é analisada e a composição dos especialistas necessários para melhorar a qualidade do desenvolvimento de sistemas de ensino multimídia à distância no campo das áreas criativas de aprendizagem é determinada; foram formulados princípios para a criação de sistemas de ensino multimídia a distância, um conjunto de ferramentas de suporte linguístico foi proposto: um modelo de informação de um sistema de reconhecimento de imagem, um modelo de avaliação automatizado, um formato de descrição de dados foi desenvolvido para permitir o monitoramento automatizado de tarefas práticas criativas dos alunos.

Palavras-chave: Educação; Sistemas de Aprendizagem Multimídia a Distância; Análise Terminológica; Suporte Linguístico.

1 INTRODUCTION

Modern information technology tools have taken an important 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. One of the most popular forms has become distance learning. Distance education allows, on the basis of multimedia tools, to analyze the personal qualities of a student, the level of his knowledge in the process of obtaining knowledge, and also ensures personalization of training. The possibility of implementing the learning process without stopping professional activity and the independence of the student from the location of the educational institution have significantly increased the role of this form of training. Such training is most relevant and in demand among socially vulnerable groups of the population and those for whom separation from their main activity is not possible (disabled people, military personnel, housewives, etc.). Territorial and temporal

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independence, the possibility of real immersion of students in the information technology educational environment based on the use of multimedia tools in the learning process have led both to the widespread use of distance learning and to the need to study and understand the educational tasks that arise in its course. The solution of distance learning problems is especially relevant 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 known as e-Learning is becoming increasingly popular - (according to the definition of 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 sharing and collaboration. Thus, the development of distance education is inextricably linked with the introduction of new computer technologies in the learning process, in particular, multimedia systems, and in the context of e-Learning - distance multimedia learning systems. Distance multimedia learning systems are complex learning systems for providing the educational process based on multimedia and telecommunications.

Currently, the greatest development and distribution have been received by distance learning systems focused on natural science and technical areas of education. The largest number of distance learning university courses have been created and implemented in the field of information and communication technologies, management, and the study of foreign languages.

At the same time, today the processes of development and application of distance multimedia learning systems in the educational process in creative areas of training do not meet modern requirements in terms of their pace and scale. This is especially true for higher humanitarian education, which, unlike university training of technical specialists, is equipped to a much lesser extent with the technical and human resources necessary for the creation of distance multimedia learning systems. As a result, today distance educational technologies have not yet been widely used in the training of specialists in the humanities, including music, choreography, painting, design (Zahrebniuk, Y., Zheliaskov, V., Romanyshyn, I., Varekh, N., & Yakymenko, P., 2021). The greatest difficulty in creating distance multimedia learning systems for creative areas of training is the development of automated control in the implementation of professional competencies of students. In the distance multimedia

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learning systems presented on the market of educational technologies, there is no automated control of the creative tasks being performed, and, consequently, there are no assessment tools for educational results. As a rule, practice is assessed remotely and "manually", using feedback from the mentor or tutor and the student, which significantly increases the time for checking and evaluating creative practical tasks.

The greatest difficulties in creating automated control of distance multimedia learning systems arise when developing such a system component as linguistic support (Herman, V., Vesolovskyi, O., Pysmenna, I., Kolodyazhna, A., & Mnozhynska, R., 2024). Linguistic support tools accompany the entire process of creating distance multimedia learning systems and determine the composition and structure of the multimedia system. The creation of a data description format for outputting information for the purpose of automated control of students' creative assignments will improve the technology of distance learning e-Learning in the field of creative disciplines.

The significant educational potential of multimedia technologies is noted in the works of philosophers, sociologists, cultural scientists, teachers, linguists, and philologists (Bers, T.H., & Smith, K.E., 1991), (Chesnut, C. E., Hitchcock, J. H. & Onwuegbuzie, A. J., 2018), (Creswell, J. W., 2014), (Douglass, J. A., Thomson, G. & Zhao, C.-M., 2012), (Harvey, L., Drew, S. & Smith, M.,2006), (Nicometo, C., Anderson, K., Nathans-Kelly, T., Courter, S., & McGlamery, T., 2010), (Hodis, F. A., & Hodis, G. M., 2022), (Hodis, G.M., Bardhan, R.N., & Hodis, F.A., 2015), (Hodis, F. A., & Hodis, G. M., 2015), (Habermas, J., 1981), revealing the socio-cultural nature of multimedia. At the same time, different groups of researchers agree that the role of telecommunication technologies in education is only increasing.

Linguistic support (LS) of educational multimedia systems is still one of the most important problems that require resolution. This is the distribution of funds and resources for the creation of distance learning courses, methods and technology for creating such systems, criteria for assessing educational results (Lin, A. R., 2021), (Lin, A. R., Dawes, N., Simpkins, S. D., & Gaskin, E. R., 2020), (Liu, Y. Y., Simpkins, S. D., & Lin, A. R., 2018), (Lin, AR, Simpkins, SD, Gaskin, ER, & Menjívar, C., 2016), (Lin, A. R., Lawrence, J. F., Snow, C. E., & Taylor, K., 2016).

The most widespread and, to a large extent, generally accepted definition of linguistic support for training systems can fully include the following: LS is a set of natural and information retrieval languages, methods, means of indexing and searching for information for interaction between personnel, users and the system.

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The object of the article is distance multimedia learning systems.

Subject of the article: linguistic support for distance multimedia learning systems.

The purpose of this work is to develop linguistic support for automated control of distance multimedia learning systems.

2 METHODS

The methodological basis of the article was:

theories, concepts and leading ideas of informatization of education; provisions of the theory of information processes and systems.

In the course of the work, the authors' works in the field of linguistics, pedagogy and information technology were studied.

Research methods. To solve the tasks and test the working hypotheses, the study used a set of theoretical methods and techniques adequate to the nature of the object under study:

- methods of system analysis, which were used at the stage of identifying the problem area, determining its relevance, setting goals and developing solutions;

- methods of terminological analysis, which were used in a comprehensive study of various scientific works on the research problem;

- methods of algorithmization and programming used to develop a data description format;

- methods of empirical research to obtain data on the functioning of the pattern recognition system and the automated assessment system.

3 RESULTS AND DISCUSSIONS

Innovative processes in modern education are aimed at developing 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 becomes not only accessible, but also exciting, because multimedia systems are created at the junction of many knowledge and areas. A modern distance multimedia learning system is a synthesis of vivid audio-visual images, animation, video, practical and game components, etc. Education is aimed at a personality-oriented approach; the main task is the need to prepare students for subsequent independent learning, life, work, outside of a mentor, teacher, etc. Stimulation of creative potential creates a new space for the formation of a wide range of skills. There is an accumulation of life experience and mobilization of knowledge, contributing to the knowledge of something new. Distance education provides new opportunities for the consumer, for example, the opportunity to study international programs. Leading universities in the world offer distance learning of their programs, their various versions in different languages of the world. Today, you can get a diploma from these universities, studying in your country at home, in a convenient mode. Many universities are trying to use satellite communication resources to broadcast their programs to needy and lagging countries; the main areas of study are IT technologies, management, multimedia, computer development, etc.

Distance education in creative professions is dual in its development. Technical progress has reached a high level, but the question of whether a computer is able to evaluate creativity is extremely controversial.

Of course, the algorithms of modern machines, artificial intelligence, neural networks are capable of high performance in any field, but the issue of ethics in assessing the quality of creativity is too complex and controversial.

It is important to note the advantages that distance education has generated.

Mass distribution. At the same time, the same course can be available to thousands of students from different parts of the country (Fabian, M., Tur, O., Yablonska, O., Rumiantseva, A., Oliinyk, H., & Sukhlenko, I., 2022).

The globalization of distance education allows you to transfer accumulated experience and knowledge. Databases are created everywhere, which can be accessed without restrictions. Using the accumulated experience based on the experience of many generations, multimedia has made it possible to embody this knowledge in data libraries that can be available to students around the clock.

Access to electronic databases. This characteristic is one of the key factors in the development of computers. The more information is loaded into the network, the "smarter" the computers become.

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Distance education forms a new unified learning environment. Such examples include online universities that combine many taps, programs, systems, etc.

Open borders. Distance education is not tied to a territory or location.

An important property that contributes to the popularity of using multimedia systems for training is the property of interactivity. Interactivity means the level of relationship between the system and the student. Interactivity allows the student to enter into an active learning process in the system, thereby creating a process of dynamic dialogue. Due to the interactive capabilities of interaction with the system, involvement in the learning process increases, the motivation of the student grows, the development of creative thinking increases, and the creative potential of the student is formed. At the psycho-emotional level, interactive interaction allows the student to feel success.

These positive properties are not the only ones that can be highlighted; thus, it should be noted that:

Distance learning contributes to the organization of independent work of the student, which determines the formation of new personal qualities, 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, takes notes, solves problems and exercises; in the case of a provided connection with a mentor, all work is structured in such a way as to stimulate the student to independently advance in the subject of study, overcoming tasks. Critical and creative thinking is developed in students (Gumeniuk, O., Durnov, Y., Shkuratenko, O., Kumeda, T., & Savytskyi, R., 2021). When technology is available to a student, it is easy to check the reality of facts or prove them, look at them from different angles and draw their own conclusions. Such achievements are extremely important for understanding the responsibility in one's professionalism and future professional growth. This will allow competent orientation in innovations, and will also serve to acquire the skill of flexibility in accepting new things.

Along with the 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 the lack of contact with the teacher; for many students, it is the energy and importance of the teacher that motivates them, and

without emotional stress, they lose interest in the subject, or give up at the first difficulties.

Self-discipline is a factor that students must overcome when there is no control from 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 classes. Training in the system is very often based on theoretical materials, and the studied material is not practiced.

Problems with the knowledge control system. Also, a global disadvantage of distance learning. Without a system for assessing practical assignments, the system essentially does not meet the basic standards of training.

At the moment, not all academic disciplines can be studied using a computer in full and autonomously.

The problem of user authentication. There is a high probability that the wrong person may be at the other end of the computer, since the program does not require confirmation by video or biometric data.

Development of training systems. Today, this problem is due to two aspects: high cost and complexity of development. There are also not enough funds allocated for the development of these technologies. Training systems are not fully funded due to the mistrust of investors and the state, but every year this situation is changing and the perception of e-learning is improving.

The pros and cons of modern distance learning are due to the development of information technology. Particular influence is exerted by the high cost and technical complexity of the implementation of modern distance multimedia training systems. But it should be noted that technology has had a strong influence on online learning. For example, VR and AR (virtual and augmented reality) gave rise 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 demonstrate a clear tendency towards the convergence of real and virtual environments, the reason for which lies in the emergence of new multimedia technologies and tools. By replacing traditional interaction with a computer by means of graphic interfaces with virtual reality, another principle of communication is formed,

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in which virtual objects materialize and act as control organs, receiving physical characteristics and properties comparable to the real environment. Human-machine interfaces organized in this way allow the creation of interactive educational virtual spaces that act as simulators, modeling educational situations as close to reality as possible.

Thus, Distance Education is rightfully considered a promising direction of development in the field of educational services, meeting the basic needs of the population, the 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 imaginative thinking.

The multimedia component of modern distance learning systems ensures a high level of knowledge acquisition due to the synthesis of means of influencing human perception: audiovisual, dynamic content, etc.

Multimedia is of decisive importance in choosing a training system, offering advanced methods: VR and AR technologies, simulators, simulations, virtual forms of information - all this is the prospect of developing distance multimedia training systems. Distance learning corresponds to the strategic task of education within the framework of the direction of individual independent educational activity. This approach is considered to correspond to the growing type of society and the best development of the individual.

Let's formulate the criteria for evaluating training systems: functionality, teaching methods, diversity of multimedia content, uniqueness and reliability of the material, ease of use, knowledge assessment system, accessibility, adaptability, interactivity, technical accuracy of implementation, design solution, updatable, stable, safe, learning outcome. These criteria are an important aspect for improving the quality of training system development at all stages.

It is 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. Such specialists include:

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Facilitator (curator), moderator, consultant or invigilator. Each specialist has their own function of assistance in the learning process.

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

Teacher. The teacher is responsible for preparing relevant information that must be processed for effective delivery to the virtual space of the network.

Designer. Responsible for creating a single 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 exciting interactive data, creates a shell of an intuitive interface, which allows the end user to effectively interact with the system.

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

Game interaction specialist. Develops a scenario for presenting materials. Multimedia content has many forms of expression: text, graphics, infographics, 3D graphics, video, simulators, etc. Interaction specialists work ahead of the curve, they analyze user behavior and predict options for their interaction in the training system.

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

Programmer. The work of programmers is an important final step, but, in fact, maintaining the system constantly requires the work of all members of the development team.

Thus, 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 the ease of use of the material and interaction with the system, and programmers should optimize the system, make it fast and responsive. An important part of the study is devoted to technologies and their application in distance multimedia learning systems. It is based on knowledge of technologies that can 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., can ensure the functioning of automatic review of graphic works of students studying in distance systems in the future, this is

a matter of the foreseeable future. Neural networks of machine learning are already used in various fields today, 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 distribute the process of working with large amounts of information step by step. The principle of object recognition:

- image definition;
- distribution of the image into points (pixels);
- connection of points into lines;
- construction of simple figures from points and lines;
- composition of complex objects from figures, points and lines, etc.

Machine learning can guarantee the creation of such an automated program that can analyze and present data from the analysis of creative work according to compositional laws, based on the Big Data work system.

Based on the example of expert systems operation, for solving the problem of autonomous training in creative specialties, using linguistic tools, in this chapter the data in the format of linguistic support were described, theoretical data defining the tasks of control and assessment in training were structured. To automate the process of reviewing graphic works in distance learning programs the following were developed:

- pattern recognition system;
- automated assessment system;
- processed data output system – data description format.

Data description format is an important component of the study on automation of the review and assessment process in distance learning of graphic design. Data description format is the result of the work done by the pattern recognition system and the assessment system. Any knowledge control process has a certain set of objects, characteristics, methods that determine the components of control. For us the basis was compositional patterns (rhythm, symmetry, asymmetry, contrast, nuance, compositional center, methods of highlighting the c.c., accent, proportions, scale, etc.) (Mergelov, N., Zazovskaya, E., Fazuldinova, N., Petrov, D., Dolgikh, A., Matskovsky,

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V., & Dobryansky, A., 2024). The data description format is the data that the computer has analyzed, found and evaluated using the automated evaluation system (the system recognizes the details of graphic works and compares them with the existing database, which stores thousands of examples of works, with comments from teachers, analysis and additional information). We will formalize and describe this data.

For our study, a knowledge base has been formed in which the formation of classes of characteristics is applicable: enumeration. This approach is also called the method of comparison with the standard, it is focused on finding common features with those described in the class (Habermas, J.,1992). The enumeration method combines complex information into classes. Such a database with a set of samples, labels, tags will use controlled neural networks based on this data and examples.

Images for samples were structured, on these examples the machine will study the criteria of characteristics for future analysis. When processing an image, the computer sees only pixels, and each pixel will contain the necessary information (color, tone), then the pixels will be combined into lines, which will simplify the reading of information, then into simple shapes and figures. The verification algorithm will look for similarities along the boundaries of objects in images and the image being studied.

Thus, by loading examples (standards) into the database for "training" the computer, we will set a number of characteristics that the computer will use in the future when searching for certain criteria for graphic work (Giddens, A., 1991), (Fabian, M., Kuzmenko, N., Zamrozevych-Shadrina, S., Perevozniuk, V., Tolcheyeva, T., & Kramarenko, I., 2022).

By loading standard images into the database, giving them certain characteristics, recording information in a form readable by the computer, we will be able to assemble an effective database to which the computer will resort each time it recognizes and evaluates the work, so it will have options for standard display, for example, the compositional center, and the program will correlate images with these options, interpolating the evaluation options in the range of 100 points. By processing the image in this way, relying on reference examples, on bad examples, learning and gaining experience, the computer will continue to learn, which means that with each new interaction it will be able to give an assessment of the processed image with an increasingly more accurate probability.

It is by relying on these patterns that we can describe the mechanism for assessing the work, its structural elements, ordered in the format of familiar

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assessment criteria. And the format of the data description will describe what was analyzed during the review of the graphic image.

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 an advanced technology for the development of this research. But we should not forget that, in addition to the constant and deep "training" of computer programs, it is necessary to shift the focus of attention towards uncontrolled teaching methods that should imitate human behavior and thinking. The existence of such a system in teaching creative specialties will expand the range of disciplines for distance learning and improve their quality. An important point will be third-party teaching methodologies to simplify the process of mastering creative specialties in practice. At the development stage, it is necessary to break down the material according to the principle of hierarchy, where the information will be divided from general topics to clarifying ones, thereby branching out, but not fragmenting, having one structural line. Such material is easier to program and edit algorithms. Each topic at any stage of study should have an additional block, which can be supplemented with information, questions, cases, exercises, etc. This will increase assimilation and improve control over academic performance. Such an algorithm for presenting the material will be better structured at the stage of presentation in various forms of multimedia.

Defining the basic principles of development and distributing responsibilities between the development team, who must work in tandem at all stages of development, will allow creating comprehensive training systems aimed at a wide range of users (Fabian, M., Tur, O., Yablonska, O., Rumiantseva, A., Oliinyk, H., & Sukhlenko, I., 2022).

A clear process of interaction between methodology and technology on the way to developing distance multimedia training systems will increase the level of efficiency, speed of development, with proper distribution of competencies.

Modern information technologies, such as pattern recognition systems, machine learning and neural networks, are able to automate complex processes of data analysis and processing.

Pattern recognition technology allows a computer to continuously learn and collect data to form a database necessary for the possibility of creating an automatic system for reviewing and evaluating graphic images.

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An automated evaluation system for graphic images is an important step towards creating distance learning systems in the field of graphic design.

The data description format allows formalizing knowledge for the possibility of interaction between a computer and a person, to obtain data in a natural language format. Linguistic support for distance multimedia learning systems in creative specialties can create systems that are close to reality and to solving problems in a given subject area.

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 has become completely different over the past half century, and the pace of its development is constantly accelerating. Education - as an engine of progress and the foundation of the future, demonstrates the guidelines of society, its development and aspirations.

Multimedia distance learning systems are an innovation that has significantly influenced the educational process. Analysis of the educational services market shows that the demand for distance learning is growing. In the course of the work, the relevance of distance multimedia learning systems in relation to the educational environment was analyzed, methods of organizing distance education were studied, the principles of working with the training system were structured (Kronivets, T., Yakovenko, O., Tymoshenko, Y., et al, 2023). Distance multimedia learning systems are full-capacity training systems of the full spectrum: theory - practice - control. It should be noted that the problem of the methodology of organizing distance learning using multimedia systems, their use and creation is a constantly and rapidly developing process. Multimedia systems allow you to switch to independent acquisition of knowledge, which is also economically beneficial for the educational system as a whole. Multimedia systems can improve and speed up the learning process. Many studies show that the use of multimedia systems motivates learning and individualizes its process - this is the specificity of using multimedia in the learning process. Criteria for evaluating distance multimedia learning systems have been developed. An important aspect of modern learning systems is not only the aesthetics of graphic design, but also the ergonomics of the user interface. Good design affects perception. The design should be consistent with the goals of the learning system at each stage,

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based on user experience and convenience; all elements, graphics should work together. Competent design can simplify the process of interaction with the learning system. The student will concentrate on the creative learning process, and not waste time to understand the system. Adaptive design guides the student, speeds up the memorization process, intelligent design forms images and connections between visual elements. Research shows that memorization is enhanced if the student is able to combine data into groups that can be analyzed. In turn, an overloaded interface creates a problem of perception and switches attention to itself.

The stages and principles of developing distance multimedia learning systems are formulated, including the composition of the development team is proposed. The creation of distance multimedia learning systems is a complex process that requires highly qualified teamwork, as well as high economic costs. The identified principles allow dividing areas of competence between specialists at the design stage, as well as ensuring a continuous assembly process, because understanding the functioning of the system ensures the solution of didactic problems.

The demand for distance learning in creative specialties, in particular the profession of graphic design, is a sought-after area. However, during the analysis of the market for distance learning programs, it was revealed that the systems do not meet the consumer's demand for full distance support. It was proposed to turn to relevant technologies, such as machine learning, deep learning, computer pattern recognition, etc.

The organization of review, control and assessment does not meet the criteria for the autonomy of the system. Knowledge control is the most important aspect of e-learning. Control helps to record the achieved learning results. Control is an important tool for organizing educational activities, as it helps to evaluate the acquired knowledge, skills, abilities and respond to gaps in training in a timely manner. The objectives of control can be called:

-        preparing students for new knowledge;
-        monitoring the acquisition of knowledge.

Distance learning of creative specialties in most cases is not provided with an autonomous control function, due to the complexity and high cost of the development process. The paper studies the possibilities of linguistic support for distance multimedia learning systems for working in the direction of automatic review of graphic works. In

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order to practically implement the possibility of remote review of graphic works, we use machine learning technologies.

Machine learning is a technology that can solve complex problems of creating, providing distance learning systems during development. The creation of a pattern recognition system, an automated assessment system proposed in the study, necessary for creating a function for automatic review of students' graphic works, are also based on the work of neural networks. To implement the work of such systems, a data description format has been created that allows you to interact with a computer and receive analysis data from it. Teaching with the help of multimedia and current information technologies has a huge potential for improving the process of distance learning. The key role in improving the quality and accessibility of distance learning depends on the technologies of the information environment and the possibilities of integrating analytical and control tools into the system. Such pedagogical innovations are capable of solving the problems that society sets before us in the field of education.

An interesting innovation of modern distance multimedia learning systems can be called "emotional informatics" - this is the ability of computing technology, in the process of learning a student, to recognize his emotions and adjust the course of study. Distance learning uses technology for the benefit and improvement of the process: flexible displays, remote presence devices, 3D - a breakthrough and future distance education. Distance education has firmly entered the education system, and despite the common opinions about the quality of this format, distance learning occupies an important niche for the future of education and will expand its boundaries and strengthen its positions. It is the high degree of technologization of distance education that makes it an important part of the educational system, both higher professional education and retraining courses, additional training, school and preschool education.

4 CONCLUSIONS

Thus, for the creation and full functioning of distance multimedia learning systems, it is necessary to distribute powers between specialists in different fields of knowledge (teachers, interaction specialists, linguists, ux/ui designers, content managers, programmers, etc.) in the process of developing and launching systems for their effective use. The key roles of specialists at different stages of development,

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design and maintenance of distance multimedia learning systems are considered in detail.

For the creation and effective functioning of distance multimedia learning systems, it is necessary to use the following evaluation criteria: functionality, teaching methods, diversity of multimedia educational content, uniqueness and reliability of the material, ease of use, knowledge assessment system, accessibility, adaptability, interactivity, technical accuracy of implementation, design solution, updateability, stability, security, automation of control, which ensures optimal system performance, its productivity and profitability. These criteria are applicable both at the design stage and at the stage of evaluating distance multimedia learning systems when choosing education and direction. The main principles necessary for the development of effective distance multimedia learning systems are: multi-component nature, volume, parity, variability and publicity. Each principle includes the main components of distance multimedia learning systems:

carefully selected, structured according to a certain algorithm, educational material that contains various multimedia methods of training and control;

software tools that are responsible for the functioning of the system;

linguistic tools necessary for the functioning of the system components and providing structuring and format for describing data.

The conceptual model of automated control of students' creative tasks, which include the author's graphic objects (images), requires the following functional systems:

pattern recognition system. The system that applies machine learning technologies for pattern recognition, "accumulating" experience and learning. Using a recurrent neural network for class formation of initial characteristics as its basis, it provides flexibility with a high degree of variability.

automated assessment system. The automated assessment system is built on two parts: recognition of a certain criterion and assessment of this criterion. For this system to work, it is necessary to create a database containing reference examples with comments.

data description format. The data description format interprets the work done by the pattern recognition system and the assessment system.

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The information and linguistic model, on the basis of which automated control and assessment of students' creative works containing graphic elements is carried out, namely structuring, description and coding of the results of analysis by computer means is presented in the form of a data description format.

The essence and content of the following concepts are specified: distance multimedia educational systems; linguistic support for distance multimedia learning systems; automated control of creative practical tasks.

The general theoretical and methodological foundations for the development and application of distance multimedia educational systems in the field of creative areas of education are identified: the principles for creating distance multimedia learning systems and the criteria for assessing educational results are proposed; the ways of improving the conceptual model for designing distance multimedia learning systems are characterized; the composition of the team of developers of distance multimedia learning systems is determined.

The main principles of information analysis for the algorithm of its processing in distance multimedia learning systems are structured.

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