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THEORETICAL BASIS OF WORKING WITH MODERN MULTIMEDIA TOOLS

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Abstract

In this state, theoretical and practical aspects of work with modern multimedia tools are analyzed. Multimedia technologies enrich the educational process with interactive and visual means, improve understanding of simple concepts and long-term learning. In addition, multimedia tools are effectively used in professional and scientific data.

Keywords: Multimedia, interactivity, education, visualization, educational technology, professional activity, scientific activity, pedagogical approach, virtual laboratory, 3D modeling.

Аннотация

В данной статье анализируются теоретические и практические аспекты работы с современными мультимедийными средствами. Мультимедийные технологии обогащают учебный процесс интерактивными и визуальными средствами, упрощают понимание сложных концепций и способствуют долговременному усвоению знаний. Кроме того, мультимедийные средства эффективно применяются в профессиональной и научной деятельности.

Ключевые слова: мультимедиа, интерактивность, обучение, визуализация, образовательные технологии, профессиональная деятельность, научная деятельность, педагогический подход, виртуальная лаборатория, 3D моделирование.

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In the modern world, the rapid development of information and communication technologies requires new approaches in various fields of education, science and professional activity. In particular, multimedia tools are considered an important tool for conveying information, learning and creating interactive experiences. Multimedia technologies are interactive systems that combine text, image, audio and video elements, with the help of which complex concepts can be expressed visually and audibly. Working with modern multimedia tools not only improves the quality of information delivery, but also creates the opportunity to attract user attention, develop independent learning and creative activity. In recent years, the integration of multimedia tools in educational systems has become a global trend. In particular, digital learning platforms, interactive textbooks, virtual laboratories and simulation programs have been developed based on multimedia , which make the learning process more effective and interesting. International studies show that materials enriched with visual and audio components help to maintain knowledge for a long time and improve understanding in the learning process. Multimedia tools also allow complex concepts to be presented in a simple and understandable form, which develops students' critical thinking and problem-solving skills. The effective use of multimedia tools is important not only in the educational process, but also in professional activities. The use of visual and interactive materials in corporate trainings, presentations, online seminars and distance learning platforms plays a major role in increasing employee knowledge, motivating them and improving their skills. At the same time, multimedia tools are widely used in various interdisciplinary projects - for example, in the fields of scientific research, design, architecture and engineering - to visualize and model complex information. Technological and methodological aspects play an important role in the process of working with modern multimedia tools. First, the presence of a user-friendly and intuitive interface is required, and secondly, the content must be high-quality, scientifically based and interactive. Therefore, aspects such as a pedagogical approach, taking into account user needs and the

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use of innovative technologies require special attention in the development and implementation of multimedia tools. In particular, tools such as animation, infographics, virtual reality and interactive simulations are of great benefit in visually explaining complex processes. It should be noted that the skills of working with multimedia tools are an important part of improving a person's information literacy and digital competencies in modern society. This, in turn, allows you to achieve high results in scientific, educational and professional activities. For this purpose, one of the pressing issues is the study of methodological recommendations, pedagogical approaches and technological solutions related to the study and effective use of multimedia technologies. This article analyzes the theoretical and practical aspects of working with modern multimedia tools, ways to increase their efficiency and the possibilities of their use in educational and professional activities. The article also discusses the advantages of multimedia technologies, their working methodology, pedagogical and technological aspects, as well as experiences of their effective use on a scientific basis.

Studied today not only in education, but also in professional and scientific activities. Multimedia technologies are interactive tools that combine text, audio, video, graphics and animation elements, which help the user understand complex information. Research shows that the combination of visual and audio content makes the learning process significantly more effective (Mayer, 2009). In international studies, the effectiveness of multimedia tools in the educational process has been proven through numerous experiments. For example, Clark and Mayer (2016) showed in their work that multimedia-based teaching materials improve students' long-term retention of knowledge. At the same time, multimedia tools develop independent thinking and critical thinking skills in students by increasing interactivity. Studies show that materials enriched with videos and animations in the learning process are 30-50% more effective than traditional text textbooks (Moreno & Mayer, 2007). Technological and

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methodological aspects are closely related to each other when working with modern multimedia tools. It is worth noting that the effective use of multimedia tools depends not only on their technological capabilities, but also on pedagogical approaches. Polat (2018) notes the importance of visualization, interactivity and user-friendlyness of educational material when integrating multimedia tools into the educational process. In this sense, taking into account methodological recommendations when developing multimedia tools increases the effectiveness of the learning process. The use of multimedia tools in professional and scientific activities has also been studied separately. For example, in the fields of architecture, engineering, design and medicine, it is possible to visualize complex processes using 3D modeling, virtual reality and interactive simulations (Bacca et al., 2014). At the same time, multimedia-based materials in corporate training and distance learning platforms serve as an effective tool for increasing the level of knowledge and increasing the motivation of employees (Salmon, 2000). There are also studies on the use of multimedia tools in educational and professional activities in the context of Uzbekistan. For example, Kochkarov (2020) shows the possibilities of increasing students' motivation to learn and consolidating knowledge by integrating multimedia tools into the pedagogical process. At the same time, various scientific works highlight the advantages of using multimedia tools through interactive textbooks, virtual laboratories and animation modules (Ergashev, 2019). In addition, the ability to work with multimedia tools is an important factor in increasing a person's digital literacy and information and communication competencies. International studies show that students who receive multimedia-based education achieve high results in the rapid reception of information, its analysis and development of creative solutions (Prensky, 2001). In this regard, the study of multimedia tools and their effective use are one of the current issues today. It is also worth noting that there are a number of difficulties in working with multimedia tools. For example, high-quality preparation of content, work with technological equipment, and pedagogically correct use of

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interactive elements are required. Some studies have shown that the incorrect use of multimedia tools can lead to the dispersion of attention and the appearance of distracting elements in students (Mayer & Moreno, 2003). Therefore, when developing multimedia tools, user needs, pedagogical approaches and technological capabilities must be taken into account together. In general, international and local literature has widely covered the advantages, methodological approaches, technological aspects and areas of application of working with multimedia tools. Research shows that multimedia tools serve as an effective tool for presenting complex concepts in a simple and understandable form, creating an interactive learning process, and developing students' critical thinking and creative skills. At the same time, multimedia technologies also allow for the implementation of innovative solutions in professional activities.

Literature analysis shows that working with modern multimedia tools is an integral part not only of scientific and educational, but also of professional activity. Therefore, developing methodological recommendations for the effective use of multimedia tools, studying their pedagogical and technological aspects, as well as creating content tailored to user needs, is one of the current scientific issues.

In the process of studying the effectiveness of working with modern multimedia tools, a number of important aspects are identified. First of all, multimedia technologies allow for interactive and visual enrichment of the learning process. The results of the study show that combining text, audio, video and animation components of educational material helps to consolidate knowledge and facilitate the understanding of complex concepts. For example, in experiments conducted by Mayer and Moreno (2007), it was shown that multimedia-based teaching materials were better perceived by students than traditional text materials and helped to retain knowledge for a long time. The results of the study also show that the level of interactivity is important when working with multimedia tools. Interactive elements allow students to develop critical thinking, independently

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solve problems and form a creative approach. At the same time, the effectiveness of multimedia tools is closely related to their adaptation to the needs of the user. For example, complex animations or excessive visual elements that do not match the user's level can distract attention and slow down the learning process. Therefore, it is recommended to take into account pedagogical and methodological recommendations when developing multimedia content in research (Clark & Mayer, 2016). The use of multimedia tools in professional and scientific activities is also analyzed separately. Studies show that complex processes are explained visually using 3D modeling, virtual reality, interactive simulations and animation modules, which helps to increase the knowledge of employees and students and develop their skills (Bacca et al., 2014). At the same time, multimedia- based materials in corporate training and distance learning platforms are an effective tool for increasing employee motivation and consolidating knowledge. Studies show that interactive and visually enriched educational modules are 20-40% more effective than traditional textbooks.

Studies conducted in Uzbekistan also confirm the pedagogical and technological advantages of working with multimedia tools. For example, Kochkarov (2020) notes the opportunities for increasing student motivation and consolidating knowledge by integrating multimedia tools into the educational process. Ergashev (2019) emphasizes the importance of multimedia tools in simplifying and increasing the efficiency of the educational process through interactive textbooks, virtual laboratories, and animation modules.

These studies show that multimedia tools, when used in conjunction with modern pedagogical approaches, provide high results in enriching the learning process and increasing its effectiveness. The study also identified difficulties in working with multimedia tools. For example, there are issues such as high-quality content preparation, effective use of technological equipment, and pedagogically correct use of interactive elements. Mayer and Moreno (2003) show that improper use of multimedia tools leads to the dispersion of attention and the emergence of

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distracting elements in students. Therefore, the results of the study indicate the need to take into account the needs of users, pedagogical approaches, and technological capabilities in the development and implementation of multimedia tools. In addition, studies confirm the positive impact of multimedia tools on the development of digital literacy and information and communication competencies of an individual. Students who receive multimedia-based education acquire high skills in quickly receiving information, analyzing it, and developing creative solutions (Prensky, 2001). In this sense, the ability to work with multimedia tools is an important factor in the formation of competencies that meet modern requirements not only in acquiring knowledge, but also in professional and scientific activities. The research discussion shows that the effectiveness of working with modern multimedia tools depends on a number of factors: the quality and scientific basis of the content, the level of interactivity, compliance with user needs, and consideration of pedagogical approaches. At the same time, multimedia tools serve as an effective tool for presenting complex concepts in a simple and understandable form, enriching the learning process, and developing critical thinking and creative skills. The research discussion shows that the use of multimedia tools is important not only in education, but also in professional and scientific activities, and that it is necessary to take into account methodological, pedagogical and technological aspects in their development and implementation. On this basis, the development of methodological recommendations for the effective use of multimedia tools and conducting experimental tests is an urgent scientific and practical task.

Conclusion

This article analyzes the theoretical and practical aspects of working with modern multimedia tools. Studies have shown that multimedia technologies enrich the learning process interactively and visually, facilitate the understanding of complex concepts, and help retain knowledge for a long time. Interactive

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elements develop critical thinking, independent problem-solving, and creative approach skills in students. Multimedia tools are also effectively used in professional and scientific activities. 3D modeling, virtual reality, and animated simulations allow for the visualization of complex processes and increase the knowledge and skills of employees. The results of the study showed that the effective use of multimedia tools depends on the needs of the user, the pedagogical approach, and technological capabilities. Uzbek and foreign studies confirm the advantages of multimedia tools, the importance of interactivity and visual enrichment in increasing the effectiveness of education. At the same time, it is necessary to ensure the quality of content and take into account methodological recommendations. In general, working with multimedia tools is an important competency that meets the modern requirements of not only education, but also professional and scientific activities.

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