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## **ПІДВИЩЕННЯ ЕФЕКТИВНОСТІ ПРОФЕСІЙНОЇ ДІЯЛЬНОСТІ ЗАСОБАМИ СУЧASНИХ МУЛЬТИМЕДІЙНИХ ТЕХНОЛОГІЙ**

**Анотація.** Сьогодні Україна реформує систему освіти, щоб наблизити її до сучасних соціальних та економічних реалій. Мультимедійні технології є одним із найбільш перспективних напрямів розвитку інформаційних технологій. Із використанням таких технологій з'являються нові можливості реалізації принципово нових форм і методів навчання, які спрямовані на підвищення якості й ефективності навчальної та самостійно-пізнавальної діяльності студентів та учнів. Одним із ключових напрямів є підготовка майбутніх учителів до знання мультимедійних технологій, оскільки вони повинні закласти основу комп’ютерної підготовки учнів та сформувати основні ідеї та навички в галузі мультимедіа. У статті показано можливості ефективного використання мультимедіа для реалізації освітніх та розвивальних функцій навчання у загальноосвітній школі за умов цифровізації освіти. Проаналізовано сучасний стан використання мультимедійних технологій у професійній діяльності вчителя; особливості вивчення теми “Мультимедійні технології” у старших класах профільної школи; наведено приклади використання мультимедійних сервісів для створення інтерактивних вправ та завдань; розроблено сайт із методичними рекомендаціями щодо використання мультимедійних технологій у професійній діяльності для вчителів-предметників; наведено результати апробації, які показують, що мультимедійні технології відкривають нові методичні підходи в системі загальної освіти, дають можливість економити час на уроці, наповнити його інформацією, поєднуючи різноманітні засоби, які будуть сприяти глибшому й усвідомленому засвоєнню навчального матеріалу. Мультимедіа уможливлюють поєднувати вербальну та наочно-чуттєву інформацію, розвивають алгоритмічний стиль мислення, формують уміння ухвалювати оптимальні рішення, діяти варіативно.



**Ключові слова:** мультимедійні технології навчання, автоматизована система навчання, мультимедійна та відеопрезентація, педагогічна діяльність учителя.

## IMPROVING THE EFFICIENCY OF PROFESSIONAL ACTIVITY BY MEANS OF MODERN MULTIMEDIA TECHNOLOGIES

**Abstract.** Ukraine is currently reforming its education system to bring it closer to modern social and economic realities. One of the key areas is to prepare future teachers for the knowledge of multimedia technologies, as they should lay the foundation for computer training of students and form the basic ideas and skills in the field of multimedia. The article shows the possibilities of effective use of multimedia for the implementation of educational and developmental functions of education in secondary school in the context of digitalization of education. The current state of use of multimedia technologies in the professional activity of a teacher is analyzed; features of studying the topic "Multimedia technologies" in the senior classes of the profile school; examples of using multimedia services to create interactive exercises and tasks are given; developed a site with guidelines for the use of multimedia technologies in professional activities for subject teachers; The results of approbation are given, which show that multimedia technologies open new methodological approaches in the system of general education, allow to save lesson time, fill it with information, combining various tools that will promote deeper and more conscious assimilation of educational material. Thus, interactivity, structuring and visualization of information increases the motivation of students, activates their cognitive activity. Summarizing the results of the survey, it can be argued that multimedia technologies open up new methodological approaches in the general education system, save time, fill the lesson with information, and combine various tools that will promote deeper and more conscious learning. Thus, interactivity, structuring and visualization of information increases the motivation of students, activates their cognitive activity.

**Keywords:** multimedia learning technologies, automated learning system, multimedia and video presentations, pedagogical activities of teachers.

### INTRODUCTION

**The problem formulation.** Multimedia technologies are one of the most promising areas of information technology development. With the use of such technologies there are new opportunities for the implementation of fundamentally new forms and methods of teaching, which are aimed at improving the quality and efficiency of educational and self-cognitive activities of students and pupils. The use of multimedia technologies in lectures and practical (laboratory) classes provides an opportunity to diversify the presentation of information, combinations of text, sound, graphics, modeling effects. Therefore, there is a need to develop theoretical foundations for the use of multimedia technologies in the training of future teachers. Also relevant is the search for psychological and pedagogical foundations of the educational process of professional development of teachers, integrating computer and pedagogical technologies that ensure the formation of information competence of teachers, stimulate their interest in learning the didactic properties of ICT disciplines, but also the development and education of students (Abhaya Asthana, 2021).

**Analysis of recent research and publications.** The problem of using information technology in the teaching of general education disciplines is one of the most pressing problems of modern general education. Recently, a number of domestic and foreign researchers have considered in their work the use of computers and information technology in education (S.A. Beshenkov, B.S. Gershunsky, Yu.S. Ivanov, A.A. Kuznetsov, V.V. Monakhov, I.V. Robert, N.V. Sofronova and others). V.I. Andreev, V.B. Bondarevsky, V.K. Dyachenko, V.L. Kan-Kalik, P.L. Kapitsa, and others point to the formation of students' creative activity as a primary necessity in the learning process. (Volkova, 2018, Harkushevs'kyy, 2005). Possibilities of multimedia in the educational process of secondary and higher school have been the subject of research in the works of O.O. Bondareiko, Y.P. Egorova, N.V. Klemeshova, N.P. Petrova, O.G. Smolyapipova, V.A. Starodubtseva, where it is the contradiction between the high educational potential of multimedia tools and insufficient theoretical consideration of the phenomenon of multimedia from the standpoint of pedagogy (Buha, 2005). The results of research by domestic and foreign scholars (including in the international programs DELTA and TEMPUS) lead to the general conclusion that for the introduction of multimedia in most cases hinders the poor organization (didactic and technical aspects) of the educational process. There is no comprehensive approach and systematization of software and teaching aids. Educational software products are usually developed on individual topics of the discipline without providing software support for the entire course (Gladun, Sablina, 2018).

### THE PURPOSE OF THE RESEARCH

Therefore, the purpose of this study was the theoretical justification and identification of psychological and pedagogical conditions for the effective use of multimedia in the implementation of educational and developmental functions of learning in secondary school. As well as the creation and possibility of using multimedia tools to effectively support the educational process in order to organize an interactive learning environment.

### RESEARCH METHODS

Research methods: analysis and synthesis of theoretical sources on the research problem, systematization and generalization of multimedia technology tools; observation, pedagogical experiment, analysis of performance, methods of mathematical processing of experimental data to identify conditions for the effective use of multimedia in the implementation of educational and developmental functions of teaching and learning in secondary school. The



results of the research were tested and implemented in computer science lessons in the 9th and 10th profile classes of the Yakiv gymnasium of the Obertyn village council of the Ivano-Frankivsk district of the Ivano-Frankivsk region.

## **RESULTS OF THE RESEARCH**

Scientists-educators define the preparation of future teachers for the application of new multimedia technologies in professional activities as a comprehensive quality of the future teachers' personality, which is initially manifested in increasing productivity, thinking, skills, expanding and deepening knowledge through multimedia. In the process of informatization of the educational process provide opportunities to choose methods of action, self-control of their actions and forecasting ways to increase productivity. It is necessary to understand the criteria for the appropriateness of the use of multimedia technologies in a particular class - is to increase the effectiveness of learning through the use of multimedia, the possibility of implementing certain learning tools in the form of material objects (originals in natural or artificial conditions), logical and mathematical models (Didactic conditions for the use of multimedia technologies in the educational process of universities, 2012).

Experience has shown that there is no ideal model of learning, but in the process of planning lessons in different classes, teachers should try to find a reasonable relationship between reproductive and creative activities of students. At the same time, the educational process is always more effective, in which visual aids of educational materials are actively used. Today, special attention is paid to interactive teaching methods, which are carried out with the help of educational computer programs that implement activity-based learning methods. The means of implementing this method are software and hardware complexes (computers, multimedia projectors and touch panels), which provide opportunities for organizing educational and cognitive activities through interactive learning (Kademiya, 2010).

Multimedia teaching aids attract students, stimulate their interest, enthusiasm and teach them to think and act independently. The effectiveness and intensity of the impact on the emotions and consciousness of students depends on the skills and style of work of a particular teacher. They need to develop and implement learning tools that combine different types of information environments (text, music, graphics, sounds and realistic images) with activity (interactive) forms of learning to introduce computer visualization and multimedia research. It should be remembered that interactivity can be seen as an interaction between participants in the educational process, indirectly through teaching aids (Lambert, & Cuper, 2008). Recently, "interactive multimedia systems" have become widespread, which are software and methodological complexes that include: texts, sound, static images, animated images, video clips, appropriate means of reproduction; they enable the user (teacher, student) have an actual dialogue with the program using a computer and multimedia hardware - a multimedia projector and a touch (interactive) board. Information and multimedia technologies allow individualizing learning and managing the process of learning. You can choose an individual pace, taking into account the training, the specifics of perception, the needs of each student. The student has the opportunity to return to any part of the text, retake the situation, review test results and analyze them, ie ensure the implementation of the main content of the innovative approach in the educational process - creating a situation of success, that is favorable conditions for learning each child (Sablina, 2017).

At now, with the use of multimedia technologies, the role of the teacher is changing, the main task is to support and guide the process of personal development of students, their creative search and organization of joint work. Under these conditions, it is necessary to review the organizational forms of educational activities developed today - to increase independence, individual and group work, move away from traditional learning, increase the number of research and experimental practices and laboratory work. There are also a number of different technologies that should be used and implemented in lessons, not only when studying the topic of multimedia in high school, but also when studying other topics in computer science or other subjects (Semenova, Lebedeva, & Polezhaeva, 2020).

Among the educational multimedia systems, we will identify the most effective ones that can be used as a visual component of the lesson: computer simulator (reality modeling, can be used for the initial practical development of behavioral skills); automated training system (combined use of computer graphics, animation, live video, sound, other media components, especially in those cases when you need to learn a lot of information); educational films; multimedia presentation; video presentation (visual interactive tools that combine images, video and audio, and thus cover visual and auditory memory, which leads to increased productivity of the lesson), etc. (Molyaninova, 2002).

Of particular importance is the problem of professionalization of teachers in the informatization of modern society, improving their skills in the use of multimedia technologies, as it will allow him to positively influence the organization of the educational process, increase interest and motivation of students, improve learning outcomes. To this end, a pedagogical experiment was conducted, which consisted in the development of guidelines, a site of support for the use of multimedia technologies in professional activities for subject teachers and the development of interactive multimedia tasks and exercises at different stages of the lesson in the profile school. Experimental research was conducted in the Yakiv gymnasium of the Obertyn village council of the Ivano-Frankivsk district of the Ivano-Frankivsk region among students of 9th and 10th profile classes. At the beginning of the experiment, a questionnaire was conducted to assess (Fig. 1) the application of effectiveness multimedia technologies: for students - the perception of new material and the use of acquired knowledge and skills in practice through multimedia; for teachers - to visualize static and dynamic information, to prepare tasks, educational material of any basic discipline.

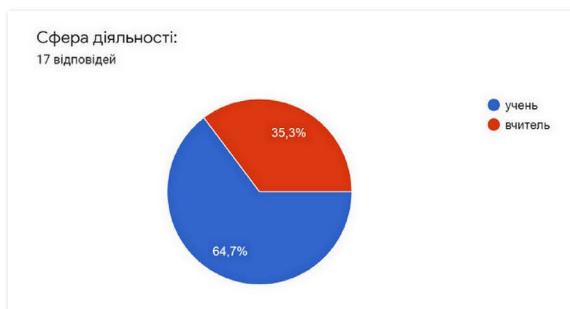


Fig. 1. Survey of respondents

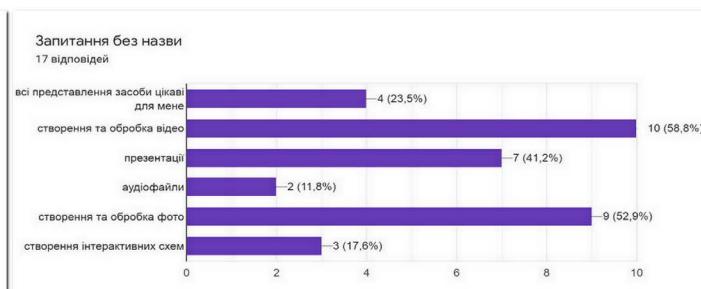


Fig. 2. List of multimedia technologies

The analysis of the survey results showed that the topic of multimedia technologies is relevant and interesting to study among students, and subject teachers expressed a desire to improve their level of information literacy by researching digital multimedia tools (Fig. 2). Therefore, we need to pay more attention to the development of a methodological site for the use of multimedia technologies for teachers, which will help to effectively prepare for lessons in various subjects, because the teacher's example motivates students to study a topic, enhances their cognitive activity. There are many advantages to using multimedia elements in learning: multimedia allows students to present information through several different multimedia, helps students develop creative thinking skills, improves their understanding of the learning material. That is why, during the research with the help of certain multimedia services, different types of tasks and exercises were created and tested, which can be used at all stages of the lesson and can facilitate the study of computer science topics in specialized schools, including while studying the topic "Multimedia Technologies".

The online service Learningapps was used to create interactive tasks. With the help of the service, exercises were created that help students test and consolidate their knowledge on the topic of "Multimedia" in the form of games, which contributes to the formation of their cognitive interest, creative development and creative thinking. To generalize and systematize knowledge on the topic, the following interactive exercises were developed: Tasks for the classification of multimedia devices (<https://cutt.ly/6YhLLmd>), Tasks for the classification of programs (<https://cutt.ly/TYhLV9X>), Tasks for finding terms (<https://cutt.ly/AYhL19G>). This approach makes it possible to differentiate tasks, it is convenient to use for the organization of "inverted" learning, project activities and more. Also, an effective tool in learning new material is the use of interactive videos. With the help of bright videos, you can concisely and at the same time interestingly and meaningfully convey the key content of the program material. Interactive videos are a great tool for quality learning, especially in distance learning. On the basis of such technology, the game project "Quiz" (<https://cutt.ly/9YhL8CU>), was developed and implemented, because today such as this form of learning is gaining popularity, which is relevant and interesting for children of all ages. There are many online services for creating a quiz. We have chosen the program "Movavi Video Editor" to develop the tasks of the educational quiz (<https://cutt.ly/rYhL6oP>). These tasks are convenient to use to summarize knowledge, skills and abilities in the form of a team game. It is interesting for students to answer the questions, because before the presentation of the answer in the team there is an active discussion and debate, and healthy competition develops between the teams. After counting the points in the created letter-task (<https://cutt.ly/1YhZe5n>) for participants, each team receives a certificate of winner or participant. Educational quizzes are a kind of intellectual team building that helps to unite the team, teaches teamwork and have to fun together, is used as a way to refresh basic knowledge or consolidate a new topic.

Modern students cannot imagine their lives without a smartphone. Therefore, the involvement of technologies with using a mobile phone in lessons further motivates them to study relevant topics. Within the framework of the research, a QR-quest (<https://cutt.ly/pYhZirz>) was developed with the aim of studying the concepts of "multimedia", "animation"; practice skills of working with multimedia data; practice skills to work with the online service "Canva"; to develop creative activity of students, computer skills; to cultivate interest in the subject, accuracy, attentiveness, discipline, formation of information culture of students. It consists (<https://cutt.ly/zYhZd5M>) of 5 stages. On each of them you will need to scan a QR code, which encrypts certain information, links to the site or a separate page, where you need to answer questions or do tasks. The use of QR-quests in lessons not only increases the motivation of students, but also provides excellent memory training, develops logic and intelligence.

As the pace of social change begins to exceed the rate of change between generations, society increasingly needs people who strive for self-development and self-learning skills. All this requires constant education of teachers, which means a way of life characterized by flexible thinking, the ability to quickly change position, to abandon the usual ideas, to accept new and unconventional. To generalize the systematization of experience in multimedia, a website (<https://cutt.ly/EYhZzV4>) of methodological assistance was created. The site contains useful sections to support subject teachers. On the site there is an opportunity to get acquainted with methodical manuals for work with multimedia services, development of summaries of lessons on multimedia, didactic exercises and useful links. There are also clear instructions for using the services and the results of students' work in multimedia editors. After approbation of tasks, interactive exercises and creation of own tasks, students passed a survey-reflection. 19 children took part in the survey, from the results of the survey it can be concluded that the use of multimedia technologies helped increase students' interest in learning



the subject, their willingness to be creative, the need for new knowledge and a sense of independence. Summarizing the results of the survey, it can be argued that multimedia technologies open up new methodological approaches in the general education system, save time, fill the lesson with information, combining various tools that will promote deeper and more conscious learning. Thus, interactivity, structuring and visualization of information increases the motivation of students, activates their cognitive activity.

### **CONCLUSIONS AND PROSPECTS OF FURTHER RESEARCH**

Experience in the use of multimedia technologies in the classroom has shown that they can increase the effectiveness of learning. These technologies reduce the time of preparation of tasks of the appropriate level, take into account the individual characteristics of students, maintain the required pace of learning and more. They open new ways for the development of thinking, provide an opportunity for active learning. Information and multimedia technologies allow individualizing learning and managing the learning process. Multimedia allows you to combine verbal and visual-sensory information, develop an algorithmic style of thinking, form the ability to make optimal decisions, to act variably.

It is also planned to develop a course on the study of multimedia technologies for subject teachers in the future. Because, the teacher first needs resources to help students better understand the topic they are studying. Giving the teacher access to multimedia learning resources will allow him to focus more on teaching the subject, help students understand the topic, discuss and solve learning problems.

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