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VIDEO-BASED LEARNING IN THE DIGITAL AGE: CHALLENGES AND OPPORTUNITIES

Abstract. The research is devoted to the study of the utmost issue of enhancing the digitalisation of modern education through video-based learning. On the basis of scientific and methodic literature review, legislation and statistics analysis, and observation of best practices the essential findings of the study have been done. The article deals with video as a learning tool. The etymology of the notion "video" is considered. The study reveals the evolution of video as an audiovisual aid in chronological order. The Ukrainian state policy aimed at video-based learning integration, support, and development is scrutinized. A review of a wide range of vivid educational resources (e.g., the English language curriculum, coursebook "Speakout", the activity of All-Ukrainian Online School, scientific and pedagogical project "Intellect", Center for Distance Learning Technologies of Kyiv Borys Hrinchenko University, online platforms Prometheus, EdEra, Diia.Education, application Leya AI) has been done to illustrate the role of video as a pivotal learning tool in the present day. To state the frequency, benefits, and challenges of video use, a questionnaire was designed. A survey was conducted among 67 people, including teenagers, youth, and adults. The findings have showcased the transformation of learning with the aid of video nowadays. The evolution of video has been traced by the development of techniques of its use from 1895 to 2024 including demonstration (e.g. motion pictures, silent movies), explanation (e.g. feature-length movies with sound and colour), engagement (e.g. television, live broadcast real-world scenarios), interaction (e.g. online videos), personalisation (e.g. AI tutors, streaming videos). The didactic value of video-based learning for personal, academic and professional knowledge, skills, and competencies enhancement has been presented in the article. The weaknesses and strengths of using videos for learning have been outlined by the author.

Keywords: video; audiovisual aid; video-based learning; learning tool; personalisation; AI tutors; streaming technology.

1. INTRODUCTION

PROBLEM STATEMENT. The 21st century has witnessed a remarkable transformation in the field of education, driven by the rapid advancement of technology. Educational technologies encompassing a wide range of tools, resources, and approaches enhance and transform learning. The proliferation of digital devices and widespread internet access has opened up new possibilities for delivering and consuming educational content. Online learning platforms, virtual classrooms, and educational apps have become common tools, expanding access to education and offering flexible learning opportunities.

The emergence of new technologies, such as artificial intelligence (AI), machine learning (ML), virtual reality (VR), and augmented reality (AR), is revolutionizing the way we teach and learn. These technologies are enabling personalized learning experiences, immersive simulations, and interactive learning environments. The evolving needs of 21st-century learners, who are digital natives and demand engaging, interactive, and personalized learning experiences, have driven the adoption of new educational technologies. These technologies can be adapted to diverse learning styles, provide real-time feedback and foster collaboration.

The rapid advancement of technology has made the digital transformation of education a pressing need in Ukraine. Recognizing the importance of this transformation, the Ukrainian government has taken steps to implement it. In 2021, the Concept of Digital Transformation of Education and Science for the Period up to 2026 [1] was approved, outlining key priorities and directions for the development of the digital educational environment. The digital transformation of education in Ukraine aims to achieve several key goals: ensure equal access to quality education for all children that involves developing online platforms and courses, as well as providing access to computers and the internet for all students; enhance the quality of education that entails using new technologies to improve teaching and assessment methods, and to create more personalized learning experiences for each student; prepare students for work in the modern world that encompasses developing 21st-century skills such as critical thinking, problem-solving, creativity, and collaboration.

Recent digital skills surveys conducted in Ukraine (2019, 2021, 2023) [2] showcase the following findings. The proportion of individuals with internet access increased by 5.4% compared to 2019. Digital skills among the population have increased by 12.6% compared to 2019 (now only 40.4% have a low level of skills compared to 53%). 58.3% of Ukrainians aged 18-70 are interested in developing digital skills. The level of AI usage among adults is 31%. Internet access has become a necessary attribute of life for 92% of Ukrainians. 72% use the internet for learning and development. 96% of teenagers use the internet. Overall, the research highlights the positive trend of increasing digital literacy and internet usage among Ukrainians.

Meanwhile, video content plays a significant role in the lives of modern youth, as evidenced by statistics. According to YouTube [3], 70% of young users (18-24 years old) watched YouTube every day in 2023. Among social media platforms, TikTok is one of the most popular among young people. In 2023, TikTok reported 1 billion monthly active users, the majority of whom are young people. Instagram also offers a Stories feature that allows users to post short videos. According to Instagram, 500 million people use Stories every day. Netflix is a streaming video platform that is popular among young people. In 2024, Netflix has 277 million paid subscribers worldwide, a significant portion of whom are young people.

ANALYSIS OF RECENT STUDIES AND PUBLICATIONS. A multitude of scientific papers [4] – [8] deal with the issue of using videos in various subject areas (e.g. language learning, science, mathematics, physics, economics, ecology, etc.). In recent research, O. Bigych et al. [4] have considered video as an authentic tool for foreign language teaching. R. Velho et al. [5] have stated the importance of video for science communication. M. Burda et al. [6] have outlined the use of video in learning mathematics by schoolchildren. L. Dorogan-Pisarenko et al. [7] have showcased economists' training through screencasts' use. Z. Xue et al. [8] have investigated the impact of video on the environmental awareness of youth.

The psycho-pedagogical benefits of video-based learning are studied in academic research [9] – [11]. C. Ikram et al. [9] have analysed pedagogical videos. M. Rice et al. [10] have confirmed the significance of television for vocabulary learning. M. Vaganova et al. [11] have presented an analysis of educational videos for higher educational establishments.

Several scientists [12] – [14] outline the significance of YouTube videos for children's socialisation, the engaging start of the lesson, cognitive and emotional resource fulfilment, etc. A. Turgenieva et al. [12] have studied the role of YouTube videos for socialization. B. Abdulla [13] has pointed out YouTube videos as lesson starters. In our recent study [14], we have proved English YouTube video clips to be a resource and cognitive tool for young learners during the Russia-Ukraine war.

The advantages and disadvantages of video gaming are analysed by the academic community [15] – [17]. In some academic papers, J. Parong, S. Hodge, C. Gonzalez Osorio et al. [15] – [17] have scrutinized the cognitive and moral aspects of video gaming.

However, the researchers C. Ikram [9], R. Berk [18], O. Khomyshak [14] emphasize the didactic potential of short videos (clips, abstracts, announcements, etc.) used in the educational process.

A cohort of Ukrainian and foreign studies is devoted to English language learning through video with the aim of foreign language communicative competency development [19] – [21]. Video-based learning aimed at methodic competency shaping of future foreign language teachers has been studied recently [19]. C. Jao et al. [20] have presented the technique of video dubbing for English communicative competency development. M. Hoque et al. [21] have substantiated flipped classroom pedagogy in the English language learning.

Meanwhile, we have not come across a systematic study of video-based learning as an educational technology in present academic papers.

The study aims to analyse the didactic value of video for learning based on its evolution in the digital age.

2. RESEARCH METHODS

In this scientific study, to achieve the outlined aim, the theoretical methods (study of psychological, pedagogical, and methodic teaching literature, generalisation and systematisation, descriptive analysis of the main scientific issues regarding the didactic value of videos) and empirical research methods (observation of best educational practices, questioning teenagers, youth, adults about the effectiveness of using videos, analysis and interpretation of the results of the conducted survey) were used.

A survey of 67 people was conducted. To determine the feasibility of using video for learning the respondents were asked the following questions:

1. What age group are you in?

a) 13-19 b) 20-30 c) 30+

2. Are you currently a student?

a) yes b) no

3. What is your primary learning environment?

a) traditional classroom b) online learning c) self-directed learning

4. How often do you use videos to learn something new?

a) never b) rarely (1-2 times a month) c) occasionally (1-2 times a week) d) frequently (3-4 times a week) e) always

5. For what subjects or topics do you find videos most helpful? (select all that apply)

a) mathematics b) science c) history d) language learning e) creative skills (e.g., art, music) f) soft skills (e.g., communication, public speaking) g) other (please specify)

6. What are the reasons you choose to learn from videos? (select all that apply)

a) they are more engaging than textbooks or lectures b) they can explain complex topics clearly c) I can learn at my own pace and rewind if needed d) videos can demonstrate skills or processes visually e) they can be a fun way to learn f) other (please specify)

7. How do videos typically impact your understanding of a topic?

a) they don't help me learn at all b) they provide a basic understanding c) they help me grasp the main concepts d) they allow me to learn complex details.

8. What challenges do you face while using videos to learn some new information? (select all that apply)

a) accessibility issues b) time consumption c) health issues d) instructional difficulties e) lack of cybersecurity knowledge f) absence of natural interaction f) other (please specify)

3. RESEARCH RESULTS

Video comes from the Latin verb *"videre"* [22], which means *"to see*". It is interesting to note that the word "*video"* was coined in analogy to *"audio"*, which comes from the Latin *"audire"* meaning "*to hear"*. Both terms were created to describe the visual and auditory components of electronic media. So, essentially, *"video"* simply means *"related to seeing"*.

Visual aids have been one of the oldest and most effective methods of knowledge transfer preceding videos long before. Their roots can be traced back to ancient times when people shared knowledge and experiences with future generations through cave drawings and other visual means. In the ancient world, Egyptians used hieroglyphics and drawings to record knowledge, and they created models for teaching crafts and construction. Greek philosophers, such as Aristotle, emphasized the importance of visual aids in learning. They used drawings and models to explain complex concepts. The Romans continued the Greek tradition, using visual aids to teach law, medicine, and other disciplines. In the Middle Ages, visual aids were primarily used in religious schools to illustrate biblical stories. During the Early Modern Period with the development of science and technology, the use of visual aids became more systematic [23, p.15].

Using visual aids is a fundamental principle of didactics, according to which learning is built upon concrete images that are directly perceived by learners. This principle was substantiated by Ya. A. Comenius [24, p. 224], one of the founders of didactics, who emphasized the importance of visual aids in education, stating that everything that can be should be presented to students through the senses. Later, his was developed by J. H. Pestalozzi and K. D. Ushynskyi.

In the 19th century, the emergence of the first textbooks with illustrations, pictures, and diagrams can be traced. A variety of technical aids were developed, such as a phenakistoscope (a spinning cardboard disk with images), a motion picture, and a kinetoscope (a device for viewing through a peephole). The roots of video-based learning can be traced back to the late 19th century when inventors like Thomas Edison and the Lumière brothers experimented with moving images [25]. While these early films were primarily used for entertainment, their potential for education was soon recognized.

In the 20th century the development of cinema (silent movies, feature-length colour movies) and radio opened up new possibilities for the use of audiovisual materials in education [25]. After World War II, the advent of computers, and other technologies greatly expanded the potential of technical devices.

The advent of television in the 1950s ushered in a new era for video-based learning. In the 1960s and 1970s the use of educational television programs, driven by government funding and the expansion of public broadcasting networks increased. Educational television programs, such as "Sesame Street" [10], revolutionized teaching by bringing interactive content into homes and classrooms. These programs played a significant role in promoting literacy, numeracy, and social-emotional learning among children and adults.

The development of home video recorders in the 1970s and 1980s further empowered educators and learners to use video for educational purposes.

The introduction of personal computers in the 1980s and 1990s marked another turning point in video-based learning. Educational software and multimedia resources emerged, enabling learners to interact with video content in new ways and engage in more personalized learning experiences.

The advent of the internet and the digital revolution in the late 1990s and early 2000s transformed video-based learning into a truly global and accessible resource. The founding of the video hosting service YouTube in 2005 [3] influenced the formation of ideas and attitudes towards video among internet users, which, according to statistics, is the second most frequently visited site. The service contains educational, professional, and amateur videos.

The rise of streaming technologies and mobile devices further accelerated the adoption of video in education during the COVID-19 pandemic in 2020 [25]. Thus, in modern days, video is an integral part of the modern learning landscape. Audiovisual aids in education have reached new heights thanks to advancements in digital technology. Interactive whiteboards, presentations, video projectors, simulations, and virtual reality allow the creation of dynamic and interactive learning materials that engage students and enhance learning outcomes. Learners can access educational videos anytime, anywhere, on a variety of devices, personalized to their individual needs and interests. Educators across all disciplines and grade levels incorporate video into their teaching to enhance instruction, engage learners, and promote diverse learning styles.

In general, the evolution of video can be traced based on the visualization of its chronological development (Fig. 1)

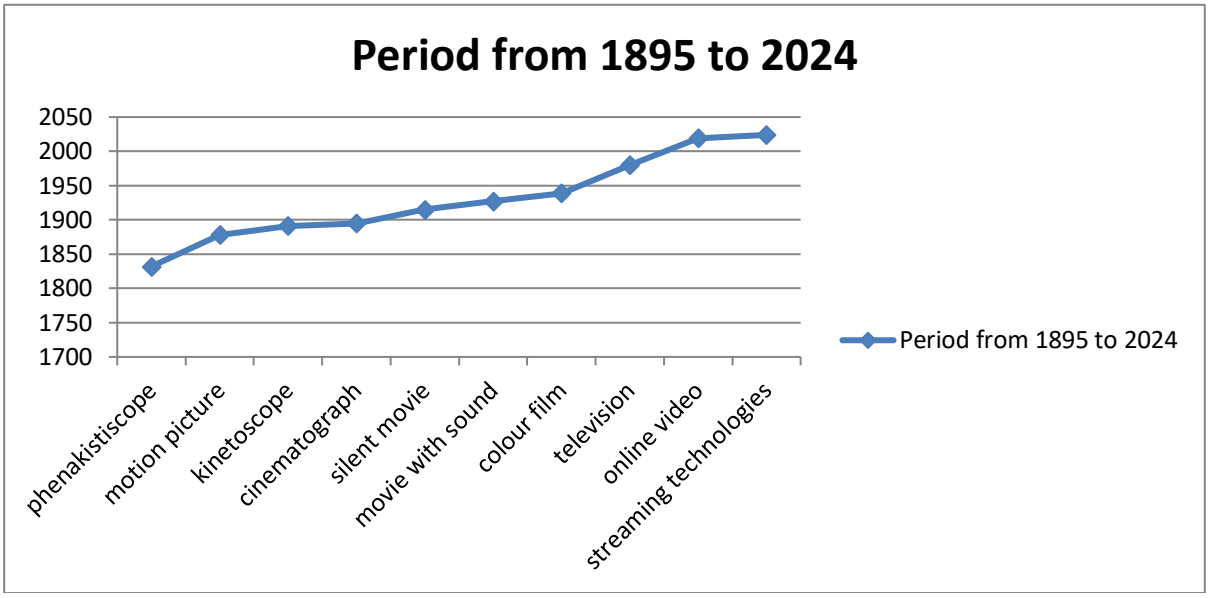

Fig. 1. Evolution of video as a learning tool

Contemporary researchers of video and its educational significance [9], [10], [16], [17] point out the uniqueness of conveying new experiences and information in an audiovisual context. R. A. Burk [18, p. 7] emphasizes the use of videos of various genres in class, namely: drama, comedy, action, romantic comedy, documentary, TV program, advertisement, educational video, etc. He suggests [18, p. 2] using a short video (announcement, video clip) in the educational process. The use of video clips in learning has significant advantages, namely: attracting students' attention, increasing their concentration, motivation, and interest in learning, the ability to predict the plot, creating an atmosphere of liveliness or relaxation, developing imagination and creativity, improving attitudes towards the subject and learning in general, interactivity of the lesson, improving memorization and understanding of the material, stimulating thinking and cooperation, immersion in the educational process, freedom of expression, learning through entertainment, emotional background, reducing anxiety and tension, visualization of content.

However, a number of scientists [9, p. 1] have distinguished a “pedagogical video” in teaching young children or adults as a “knowledge transmission format, including cartoons or animated films, real-life scenarios, reruns of courses or conferences”, etc. They illustrate the following types of pedagogical videos: video slideshow, video screencast, video interview, video on camera, video reportage, animated video, whiteboard video, 360° video immersing

the learner in a 3D environment [9, 4]. In our study, we consider video as a learning tool as well as it refers to education in general, not just to teaching.

The integration of video into the Ukrainian educational system is supported by the policy documents, e.g. the Law of Ukraine "On Education" [26] establishes the general principles for the implementation of state policy in the field of education, including the use of ICT. Article 43 of the law states that educational institutions have the right to use ICT, including video, to ensure the educational process. The National Curriculum of General Secondary Education in Ukraine [27] outlines guidelines and learning outcomes for all subjects within the general secondary educational system. Recognizing the effectiveness of video as an educational tool, several curriculum frameworks incorporate specific recommendations for its integration into the teaching and learning process.

For instance, the English language curriculum advocates for the use of video resources to foster listening and speaking skills, encourage video-based learning, and enhance overall language proficiency. From this point of view, an analysis of a cutting-edge coursebook of the 21st century that is full of motivation, authentic content, and well-structured speaking and listening activities based on video should be done. In 2011, a range of authors designed *Speakout* [28] with access to the entire archive of the BBC (DVD content, digital students' book, audio, video, and video podcasts), having selected some stunning video content to engage students. The video podcasts show real people giving their opinions about the topics in the coursebook and illustrate some of the strategies that will help students become more effective communicators using interactive worksheets. Using video *Speakout* brings the real world and real English into the classroom.

The beginning of the coronavirus pandemic in 2020 caused new strategies for the development of secondary and higher education, the need to ensure the quality of distance learning, and increased demands on staff, including their potential, mobility, and readiness for self-education. It should be noted that at the legislative level, distance learning has been equated with full-time and part-time forms of education since 2013. In practice, the implementation of distance learning took place at the beginning of 2020 with the introduction of quarantine. However, the observation and study of the experience of organizing the educational process in various educational institutions using Google Meet, Zoom, Microsoft Teams, Google Classroom, LAMS Moodle, Office 365, and Google Hangouts services proved that distance learning was happening chaotically to some extent and with noticeable technical, technological, and methodic difficulties.

Meanwhile, the All-Ukrainian Online School (VSHO) (https://lms.e-school.net.ua/) was initiated by the Ministry of Education and Science of Ukraine to ensure equal, free, and unrestricted access to quality educational content for Ukrainian students and teachers, regardless of their location during the coronavirus pandemic. Nowadays it is a state-run web platform and television school for distance learning for students in grades 1-11 and teachers. The first lessons were conducted on April 6, 2020, at 10:00 AM. Over three years of existence, the platform has hosted over 80 courses, consisting of more than 4000 lessons, a selection of diagnostic tests, and additional educational materials. The platform has recorded over three million visitors, and educational videos have been viewed over twenty-seven million times. The "All-Ukrainian Online School" platform hosts educational materials that have been reviewed and meet national educational standards: educational videos, summaries, and formative and summative assessment tests. In addition, students on VSHO can track their academic progress, diagnose, and make up for educational losses.

As for higher education, the experience of Center for Distance Learning Technologies as a structural unit of the Research and Development Laboratory for Digitalization of Education at Boris Hrinchenko Kyiv University (https://kubg.edu.ua/struktura/pidrozdili/ndl-informatizatsiji-osviti/pro-pidrozdil/zavdannja/tsentr-tekhnolohii-dystantsiinoho-

navchannia.html) is worth consideration. The Center's mission is to provide the university staff with resources for digitalizing the educational process using distance and blended learning technologies; and provide University faculty with informational, organizational, and technical support for creating modern educational video materials (video lectures, webinars, screencasts, video instructions, online conferences); monitor and adapt global experience in using e-learning tools. The distance learning studios are equipped with modern video terminals, laptops, and tablets, which provide recording and editing of various video materials (video lectures, introductory videos, video guides). The WebEx software is used to conduct and record video conferences and webinars, share content, and engage in online collaboration in real time. The choice of corporate-style backgrounds and additional lighting ensure videos have a professional look.

Additionally, the Ministry of Education and Science of Ukraine in collaboration with other government agencies actively develops methodic tips [29, p. 30] to guide teachers in selecting and implementing video-based instruction tailored to specific subjects and curriculum requirements. The resources provide practical insights and strategies for teachers to leverage the power of video in creating engaging and effective learning experiences for their students. These policy and curriculum frameworks demonstrate the Ukrainian government's commitment to promoting the effective use of video as a transformative tool in education. By providing clear guidelines and support resources, these initiatives aim to empower teachers to harness the power of video to create engaging, effective, and inclusive learning experiences for all students.

An example of such a guidance manual for using video in primary school lessons within the framework of the "Intellect" educational project can be considered (https://intellect-ukraine.org/). The "Intellect" project is a nationwide educational initiative in Ukraine aimed at developing students' intellectual abilities and creative potential. Designed for pupils from grades 1 to 11 in schools, the project encompasses a comprehensive approach to nurturing intellectual growth and fostering a love for learning. The "Intellect" project pursues the identification and development of intellectual abilities. The project employs a diagnostic testing system to identify each student's strengths and areas for improvement. Based on this assessment, personalized learning programs are developed to guide students in maximizing their intellectual potential. It cultivates creative thinking. The "Intellect" project uses innovative teaching methods to enhance the learning experience. Students engage in problem-solving activities, fostering research and analytical skills. Students undertake long-term projects, applying their knowledge and skills to real-world scenarios. ICT tools are employed to enrich the learning process. It should be pointed out the pivotal role of video in each lesson, which is supposed to be used for reproductive, productive, and creative activities in all subjects with diverse applications. A wide range of educational videos are selected for students from grades 1 to 11, covering subjects like mathematics, Ukrainian language, English language, history, science, etc. Expert educators deliver video lectures, providing valuable insights and teaching strategies for teachers. Students embark on virtual excursions to museums, historical sites, and other places of interest, enhancing their understanding and broadening their horizons. These events encourage students to showcase their creativity and share their knowledge. Parents can access video consultations with psychologists and educators, gaining valuable guidance for their children's learning.

The use of video in the "Intellect" project offers several advantages. Video makes learning more captivating and interactive, leading to better retention. Visual and auditory elements in videos enhance understanding of complex concepts. Video fosters critical thinking, problem-solving, and communication skills. Videos can be tailored to individual interests and needs, promoting personalized learning. Video makes education more accessible to students with diverse abilities and needs. Thus, the project's modern teaching methods including video-based learning make the educational process more engaging and effective. Students have

opportunities to develop their critical thinking, creativity, and problem-solving skills. By embracing innovative teaching methods and leveraging the power of video, the project empowers students to excel in their academic pursuits and become multifaceted individuals prepared for the challenges and opportunities of the 21st century.

Meanwhile, nowadays several key directions are driving the digital transformation of education in Ukraine. We can observe the development of online platforms and courses. Ukraine has several online platforms and courses offering educational resources for students and teachers. The government plans to expand access to these platforms and courses, as well as create new ones that meet the needs of the Ukrainian educational system.

Prometheus (https://prometheus.org.ua/) is a Ukrainian non-profit project of massive open online courses (MOOCs) launched in 2014. Its primary goal is to provide free online access to university-level courses for anyone interested, as well as to enable leading educators, universities, and companies to publish and distribute such courses. Successful completion of the courses results in an electronic certificate from the respective university, confirming the acquired knowledge. Each Prometheus course consists of video lectures, interactive assignments to reinforce learning and a forum where students can ask questions to the instructor and interact with each other. All that is required to participate in such a course is a computer and internet access. The Prometheus project has been in existence for 9 years. Since its launch, the site has registered over 2880000 users. Currently, over 400 courses are available for study.

EdEra (https://ed-era.com/). is a Ukrainian online educational studio with over 8 years of experience creating online courses, learning platforms, interactive games, and textbooks. The team department conducts in-depth analysis of the topic, global trends, and best practices, researches the target audience, and develops the course concept. Meanwhile, the communication department develops a promotion strategy. A creative team consisting of an art director, designers, and educational strategists, details the concept, selects material formats, and creates the visual design of the product. Educational methodologists and editors, together with industry experts, prepare the materials. The in-house production team creates materials together with methodologists who know when and how much text should appear on a video so readers have time to read it, and how to make animation work better than any other format. Project managers ensure that the educational product is of high quality and launched on time. The target audience gets the most out of learning. The communicators ensure that hundreds of thousands of users use products.

Diia.Education (https://osvita.diia.gov.ua/) is a nationwide edtech platform in Ukraine dedicated to providing access to relevant knowledge and skills. The platform offers a variety of free courses and learning resources designed to empower individuals to succeed in today's dynamic world. Diia.Education marks the next stage in the evolution of the Diia.Digital Education project, which was launched in 2020 with a focus on digital literacy and skills. There are 2.1 million registered users on the Diia.Education platform which offers a vast array of educational products encompassing over 250 educational series and other resources. It has established a network of over 5000 offline digital education hubs across Ukraine. These hubs serve as physical spaces where individuals can access computers, internet connectivity, and educational resources to support their learning endeauvors.

The concept of lifelong learning emphasizes the continuous pursuit of knowledge and skills throughout one's life. In today's rapidly evolving world, the knowledge acquired in school or university may not remain relevant for long. Continuous learning is essential for personal growth and professional success. Diia.Education provides access to the best educational practices, making lifelong learning a convenient and enjoyable habit. Upskilling refers to enhancing one's existing skills while reskilling involves acquiring new skills to transition into a different field. Diia.Education offers a wide range of educational series for upskilling,

enabling individuals to excel in their chosen professions. Additionally, the platform facilitates reskilling by providing resources for learning entirely new career paths.

Diia.Education [2] offers a comprehensive range of educational series tailored to the specific needs and interests of various target audiences. These series provide focused learning opportunities for individuals seeking to enhance their knowledge and skills in their fields. The platform recognizes the diverse learning needs of different groups within society. By providing a dedicated series for each target audience, Diia.Education ensures that individuals can access relevant and engaging content that aligns with their professional and personal goals. There are 56 educational series designed to empower young people with essential knowledge and skills for their future success. 22 educational series are focused on equipping civil servants with the competencies required for effective public service. 20 educational series are tailored to the needs of public servants, enhancing their ability to serve the public effectively. 7 educational series are dedicated to providing military personnel with specialized knowledge and skills relevant to their roles. 5 educational series are designed to enhance the skills and knowledge of healthcare professionals, improving patient care. 30 educational series are focused on providing business owners and entrepreneurs with the tools and knowledge to succeed in the dynamic business landscape. 17 educational series are tailored to the needs of teachers, supporting their professional development and enhancing their ability to deliver effective instruction.7 educational series are designed to provide foundational knowledge and skills for individuals new to a particular field or topic.

Thus, Diia.Education [2] empowers users to create personalized learning experiences by allowing them to select series based on their specific interests and goals. This personalized approach ensures that individuals receive the most relevant and beneficial learning content. The platform uses a variety of engaging and interactive learning methods, including quizzes, videos, discussion forums, and practical exercises. Simulators represent an innovative educational approach. Diia.Education's simulators allow users to experience the realities of various professions through realistic scenarios that mirror the challenges and tasks encountered by professionals in those fields. These methods make learning more enjoyable and effective, fostering a deeper understanding of the material. Upon completion of courses within educational series, users receive certificates that recognize their achievement and demonstrate their commitment to continuous learning. These certificates can serve as valuable additions to professional portfolios or personal resumes. Diia.Education has issued over 3.1 million certificates to users who have successfully completed educational courses or programs on the platform. These certificates serve as a testament to the individuals' commitment to learning and their acquisition of valuable skills and knowledge.

Diia.Education takes the mission of digital education a step further, aiming to equip individuals with a broader range of competencies and skills that are essential for success in the 21st century. It develops essential soft skills such as communication, teamwork, problem-solving, and creativity and gains the knowledge and skills to start and manage a successful business. Learning about emerging technologies and their applications in various fields helps enhance personal growth and well-being through courses on mindfulness, time management, and goal setting. The platform explores creative potential through courses in videos.

Diia.Education is a vivid sample of making education accessible to everyone, regardless of their background or financial situation. All courses and learning resources on the platform are completely free, removing any barriers to knowledge acquisition. Diia.Education serves as a powerful tool for empowering individuals to take control of their learning and development. By providing access to relevant knowledge and skills, the platform fosters a more educated, skilled, and innovative society, driving Ukraine's progress towards a brighter future.

With the increasing use of AI in education, we have recently come across Leya AI (https://leyaai.com/checkout/0), which is an innovative and research-based English learning app featuring an AI-Tutor named Leya [30], fun games, personalized lessons, and a guided learning path. It offers a flexible, stress-free, and practical learning experience that allows you to speak English with a virtual friend and track your results with real-time feedback. The application lets anybody talk anywhere, anytime, with an AI Tutor. A learner needs a device to run the app on (phone, laptop, or tablet) and voice. Leya AI is available through the web app on phones, tablets, and desktop computers without gathering any personal data. Payment information is collected through Stripe or Paypal and is never stored in the database.

Firstly, dealing with the advantages of Leya AI, we should point out its opportunities for personalized learning (due to the learner's level, his or her specific needs, focus on individual areas, etc.), conversational practice (real-time conversations, dialogical practice, discussion of current events, etc.), flexible scheduling (virtual tutor is available 24/7), instant feedback (getting immediate feedback on his or her pronunciation, grammar, and vocabulary mistakes, giving you the chance to correct them on the spot), cost-effective.

Secondly, we would like to stress the most popular virtual tutor's challenges. It does not connect students with native speakers from around the world for immediate conversation practice and cultural immersion. It can not offer a diverse selection of certified tutors with specific expertise in various English skills, teaching methods and learning styles. It is not used to focus on engaging learners with moral, social, emotional human interaction, student inclusion, etc.

Using AI in modern days, a learner often faces technical difficulties. One should have reliable internet access and video conferencing equipment to avoid disruptions during lessons. Self-motivation is another issue. Compared to a classroom setting, virtual learning requires more self-discipline and active participation. One should be prepared to engage actively with his or her tutor and be responsible for own learning.

In the context of our study, a questionnaire was developed to explore the frequency, use, effectiveness, and challenges associated with integrating video into present-day instruction. A survey was conducted among 67 people with the aim of examining current practices involving the use of video in the digital age. Participants ranged in age from 13-20 years (37%), 20-30 years (25%), and 30 years and above (38%). Additionally, 53 % of participants were students. The findings of the survey revealed that 96% of respondents were firstly familiar with traditional classrooms.

When we asked to define the frequency of video use, 49% described it as essential educational media used in the digital format. Other responses (41%) included frequent use of video (3-4 times a week). 7% stated the use of video (1-2 times a month). 3% never use video with the aim of education (Fig. 3).

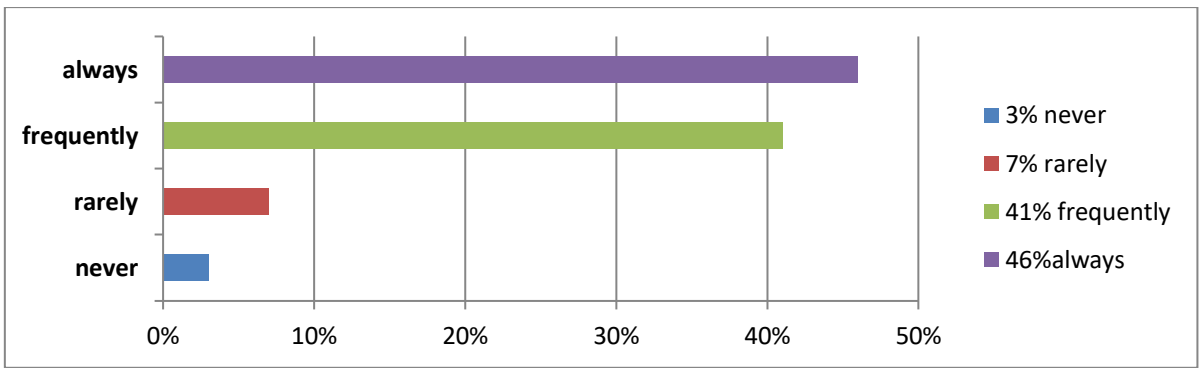

Fig. 2. How often do you use videos to learn something new?

The survey also found that a large majority of people (54%) use video in everyday life for personal, social, academic, professional, psychological, and financial purposes. 47 % get used to developing creative skills (in art and music) with the aid of video. 42% prefer to learn foreign languages using video. 29% like to improve their soft skills while watching videos. Some of them are interested in video referring to math (11%), science (18%) and history (22%) (Fig.4)

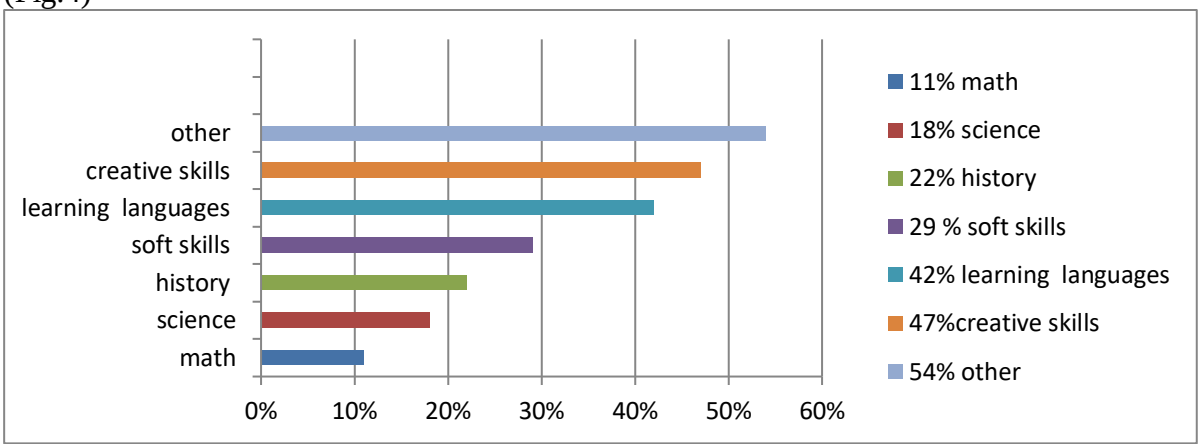

Fig.3. For what subjects or topics do you find videos most helpful?

Based on the following findings, a significant majority of respondents stated such benefits of integrating video as fostering critical thinking (48%), enhancing engagement (68%), providing more opportunities for learning (personalisation) (71%), visualisation (animation, graphics, texts, etc.) (77%), interactive activities (69%). Among other advantages of using videos suggested by interviewers, the most essential were the opportunities to create your own video content (43%), watch high-quality educational videos (47%), live scenarios used in videos (59%), practically oriented tasks below some videos (38%), etc. (Fig. 4)

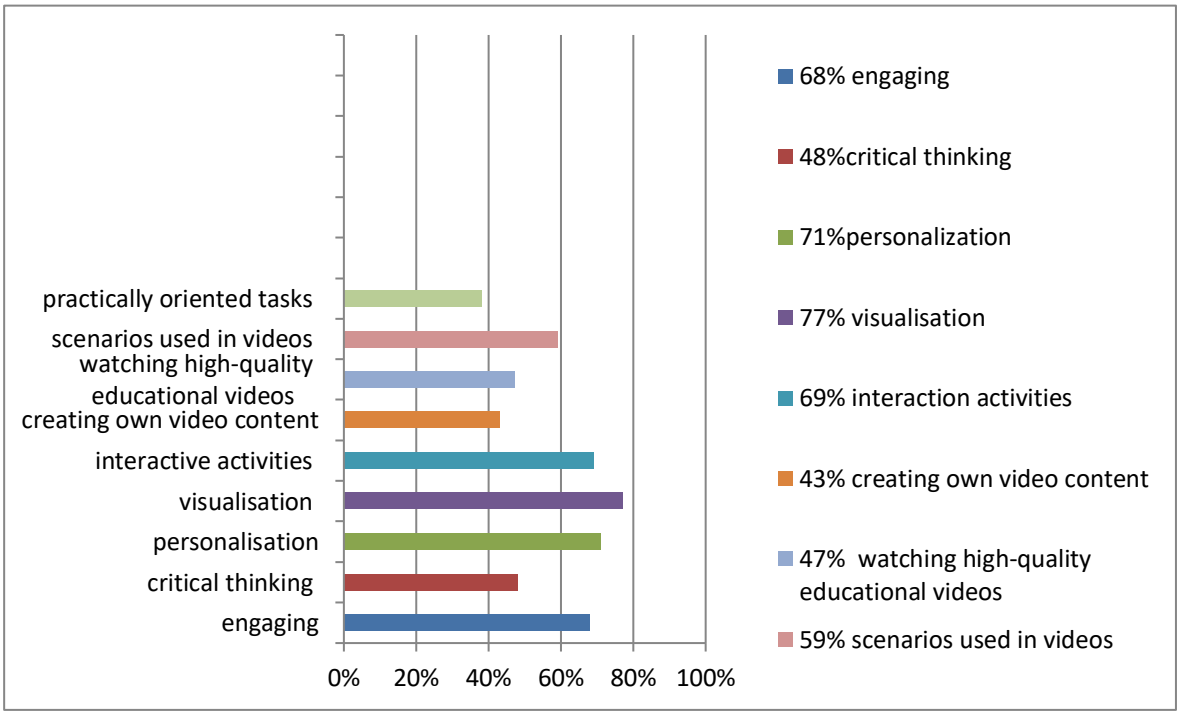

Fig. 4. What are the reasons you choose to learn from videos?

As for the meaningful impact of videos in understanding a topic, some of the respondents (26%) reported positively to the use of videos. While 23% of respondents proved that they faced no difficulties in using digital videos to grasp the main concepts. 48% encountered no challenges in learning complex ideas based on videos. 3% of them do not find using videos beneficial (See Fig. 5).

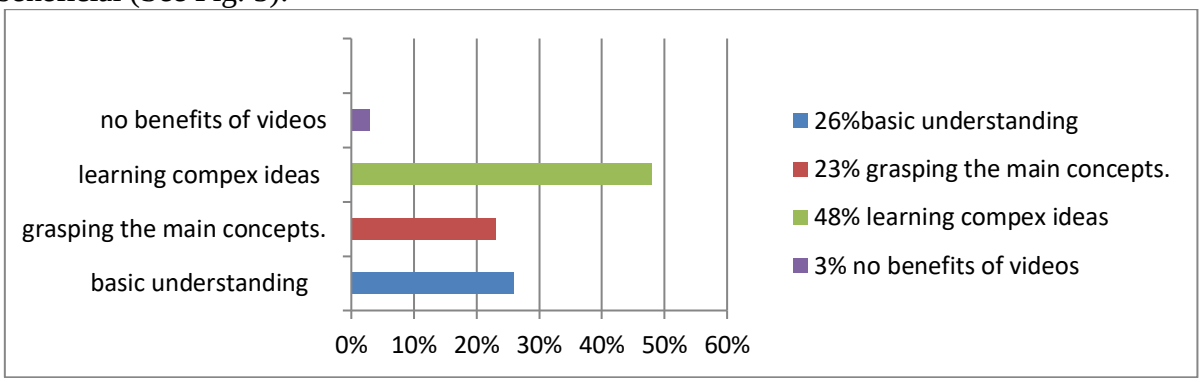

Fig.5. How do videos typically impact your understanding of a topic?

However, the following issues were raised about the negative impacts of videos, including health issues (sight, sleep, weight, etc) (67%), time consumption (78%), and accessibility issues (internet connectivity, power cuts, technical problems (79%). A more detailed analysis revealed that 41% of respondents cited a lack of face-to-face interaction and involvement as a major challenge. Other challenges included the necessity of instructional support (33%), and lack of cybersecurity knowledge (24%). Some respondents pointed out such actual challenges of using videos as addiction, video manipulation, limitation of communication, video overload, teacher job disruption, etc. (Fig. 6).

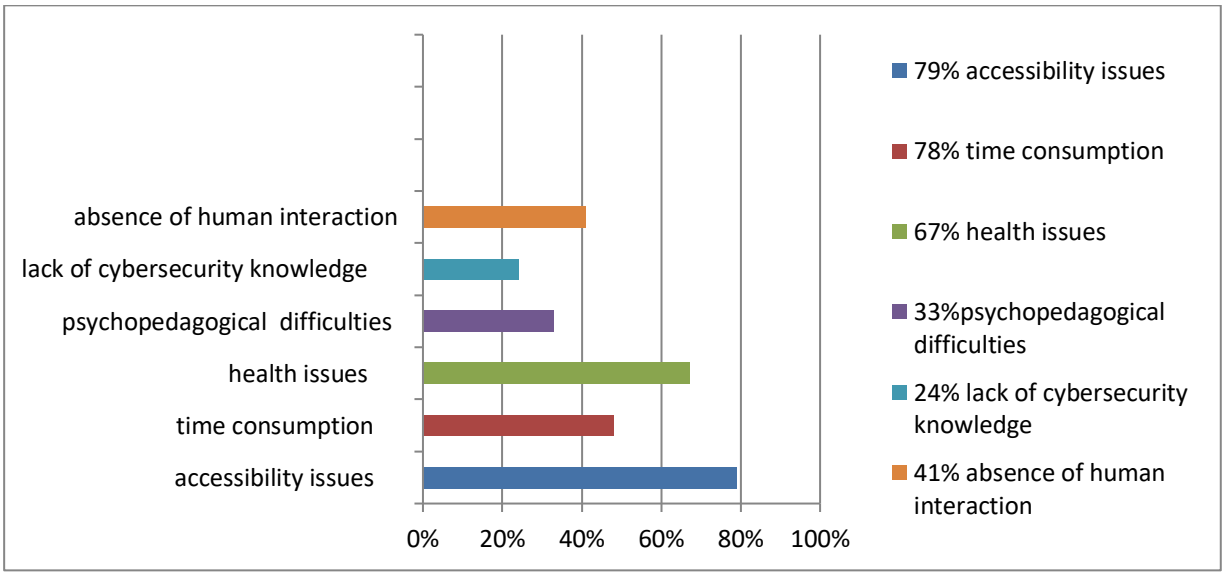

Fig. 6. What challenges do you face while using videos to learn some new information?

However, some of the respondents also expressed concerns about the long-term effects of distance learning and the increasing difficulty in distraction. Despite these challenges, modern young people believe that video offers significant opportunities to improve learning outcomes.

By analyzing the survey responses, we have gained valuable insights into the current state of video use in the digital age. The results indicate that videos are widely used and appreciated by teenagers, youth, and adults, who sometimes face various challenges in their implementation, even understanding health damage.

The analysis of the chronological development of video as a learning tool states that video-based learning has evolved by encompassing a wide range of techniques of its use from 1895 to 2024: demonstrating (e.g. motion pictures, silent movies), explaining (e.g. feature-length movies with sound and colour), engaging (e.g. television, live broadcast real-world scenarios), interacting (e.g. online videos), personalisation (AI tutors, streaming technology) (Fig.7).

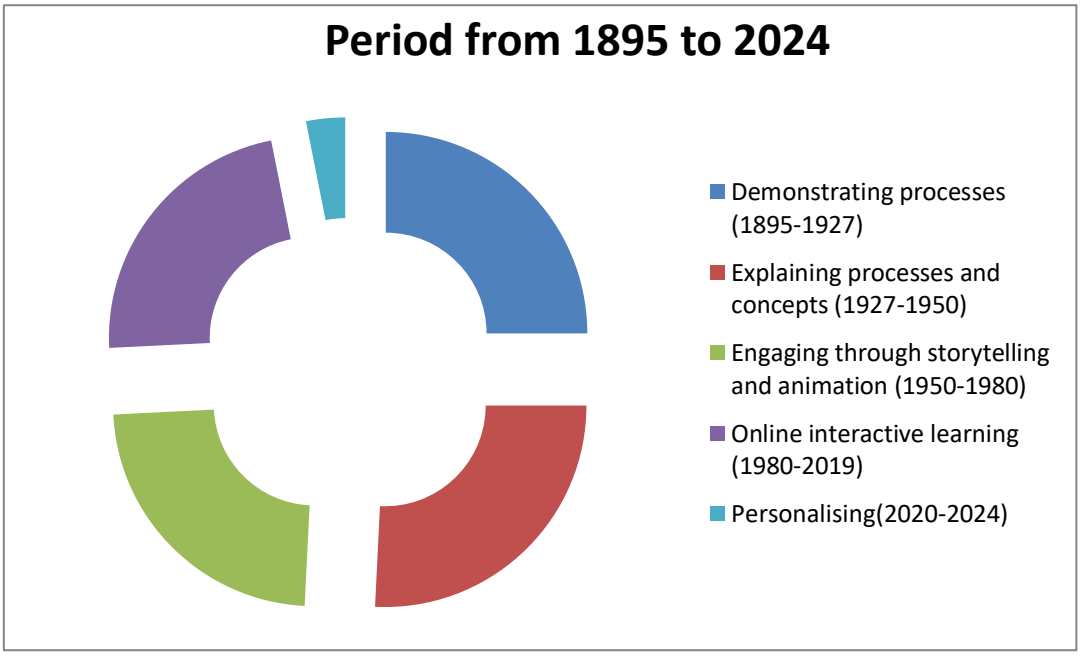

Fig. 7. The use of video as a learning tool from 1895 to 2024

Meanwhile, the development and implementation of video-based learning should be followed by such principles [31, p. 30-31]: 1. *Self-directed learning*. Self-directed activities are fundamental to adult learning. This necessitates adequate support, well-designed educational programs, learning materials, and software; 2. *Collaborative learning.* Adult learning is the most effective when it occurs through collaboration with educators and peers. Group work and communities of practice foster the exchange of experiences, ideas, and understandings. This is also known as cooperative learning or collaborative learning. *3. Experience-based learning.* Prior academic, professional, social, and life experiences serve as a valuable resource for both individual and collective learning. *4. Individualisation*. Learning plans and tasks should be tailored to meet the unique needs of each learner. Individualised learning programs consider specific educational needs, goals, experiences, skill levels, and personal characteristics. 5. *Contextual learning*. Learning should be relevant to the learner's life, work and focused on achieving specific goals. It should be grounded in real-world contexts and experiences. *6. Development of learning needs*. Assessment should focus on identifying the extent to which learning objectives have been achieved and on stimulating the development of new learning needs. *7. Relevance of learning outcomes.* Learning should be directly applicable to real-world situations. It should be problem-oriented and focus on the acquisition of knowledge, skills, and qualities that can be immediately applied in everyday activities. For

example, online courses should incorporate collaborative elements such as discussion forums, group projects, and interactions between learners, instructors or facilitators. These courses should leverage learners' prior academic, professional and life experiences as a learning resource. Assignments and projects should be linked to real-world scenarios that are familiar to learners. Learning methods can include synchronous and asynchronous modes.

CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

In our study, video is considered as an audiovisual aid. The word “video” originates from Latin and refers to auditory and visual perception of information transmitted by electronic media. The starting point of the video is the end of the 19th century when early moving pictures (phenakistoscope) were used. The beginning of the 20th century was known for black and white images, silent films, sound films, and colour films that showed more realistic images and new aesthetic possibilities. In the second half of the 20th century, television appeared in massive consumption of video content. Later, personal use of video became widely spread. Further improvement of the video was higher image quality in digital format. Internet and video hosting emerged from YouTube and other platforms for video sharing. Nowadays, new standards, and tendencies of using virtual and augmented reality, including immersive technologies for interacting with video content open golden possibilities for education.

A review of a great variety of educational resources (e.g. the English language curriculum, coursebook “Speakout”, All-Ukrainian Online School, scientific-pedagogical project “Intellect”, activity of Center for Distance Learning Technologies of Kyiv Borys Hrinchenko University, online platforms Prometheus, EdEra, Diia.Education, application Leya AI) proves videos to be valuable for promoting lifelong learning and fostering appropriate competencies among Ukrainian learners. By providing accessible and engaging educational resources, videos empower individuals to enhance their knowledge, skills, competencies, and employability, contributing to their personal, academic, and professional growth and the nation's progress.

Meanwhile, the findings of our survey prove video to be a pivotal learning tool in the present day. Video-based learning can be considered as educational technology based on the use of video for delivering content. The information may be presented with the aid of audio, images, graphics, and texts that make it more meaningful. Video, as a combo of visual and auditory supports, provides learners with a multisensory experience and improves their memory. Video-based learning ensures flexibility, engagement, and accessibility. It enables microlearning and on-demand learning in various subject areas. Video-based learning has evolved into a multifaceted tool that encompasses a wide range of techniques: demonstrative videos, explanatory videos, case study videos, interactive videos, and personalised learning videos. Video-based learning should be implemented on the basis of self-directed learning, collaborative learning, experience-based learning, individualisation, contextual learning, development of learning needs, and relevance of learning outcomes.

Stating the didactic value of video-based learning, we should sum up its personalized learning approach and support of age-level adaptive learning using real-world scenarios. However, the approach demands self-regulation (goal setting, reducing learners’ anxiety, etc.). Meanwhile, learners can face such challenges as technology breakdowns (malfunctions, connectivity), limited capabilities (viewers are eager to have advanced functionality, more natural interactions), psychological difficulties (fear of sharing personal information and loss of natural environment), etc.

As for further prospects of research the use of virtual and augmented reality, 360° videos ensuring high-quality content, design and technological solutions should be studied thoroughly, in particular referring to learners with special needs. The issue of production guides to video-

based learning we suppose to be worth consideration. Consequently, the study of the transformative role of the teacher in the present day and his or her new functions as an educational manager, facilitator, and methodic creator of video-based learning in various subject areas could fill a gap in scientific papers by the academic community.

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НАВЧАННЯ НА ОСНОВІ ВІДЕО В ЦИФРОВУ ЕПОХУ: ВИКЛИКИ ТА МОЖЛИВОСТІ

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Анотація. Дослідження присвячено вивченню актуальної проблеми підвищення рівня цифровізації освіти за допомогою застосування відео. На основі аналізу науково-методичної літератури, законодавства, статистичних даних, спостереження за передовим досвідом отримано вагомі результати дослідження. У статті розглянуто відео як інструмент навчання. Досліджено етимологію поняття «відео». У хронологічному порядку розкрито еволюцію відео як аудіовізуального засобу навчання. Проаналізовано державну політику України щодо інтеграції, підтримки та розвитку навчання на основі відео. Здійснено огляд широкого спектру освітніх ресурсів (навчальна програма з англійської мови, підручник "Speakout", Всеукраїнська онлайн-школа, науково-педагогічний проєкт "Інтелект", діяльність Центру технологій дистанційного навчання Київського університету імені Бориса Грінченка, онлайн-платформи Prometheus, EdEra, Diia.Education, застосунок Leya AI) задля ілюстрації ролі відео як важливого інструменту навчання в наш час. Для визначення частоти використання відео, його переваг та недоліків було розроблено анкету. Опитування було проведено серед 67 осіб, серед яких підлітки, молодь та дорослі. Результати дослідження демонструють трансформацію навчання за допомогою відео. Простежено еволюція відео та вдосконалення методів його використання з 1895 по 2024 рік від демонстрації зображення, німого чорно-білого кіно до пояснення в художніх фільмах зі звуком і кольором, задіяння глядача в телебаченні, прямих трансляцій реальних ситуацій, взаємодії під час онлайн відео,

персоналізації зі штучними інтелект-тьюторами та появи потокових відео. Презентовано дидактичну цінність навчання на основі відео задля розвитку особистісних, академічних, професійних знань, умінь і компетентностей. Визначено слабкі та сильні сторони використання відео для навчання.

Ключові слова: відео; аудіовізуальний засіб; навчання на основі відео; інструмент навчання; персоналізація; учитель-робот; потокова технологія.