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Revolutionizing art education: technologies and virtual platforms for the digital age

Revolucionando la educación artística: tecnologías y plataformas virtuales para la era digital

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Abstract

The development of modern art education is closely related to the use of digital technologies. The purpose of the article is to analyse the adaptation of higher art education to the requirements of the modern digital era, to study the integration of technologies and virtual platforms into the educational process through the prism of training in higher art education. In order to achieve this goal, the researcher used certain methods of scientific knowledge, which provided a thematic analysis of professional literature and a comparison of existing experiences with the Ukrainian realities of the use of digital technologies in acting education. As a result of the step-by-step study, it was noted that the tools of digital platforms and virtual reality are well integrated into teaching in art education. This allows interaction with higher education students in a remote mode without compromising the quality of education and its level. It also enables students to build digital portfolios and continue their lifelong learning. The conclusions state that the use of digital technologies in education has a significant challenge - the need for teachers to be proficient in the following tools and to use them to the maximum benefit of learning.

Keywords: digitalisation of education, e-learning, virtual laboratories, online learning platforms, distance learning technologies.

Resumen

El desarrollo de la educación artística moderna está estrechamente relacionado con el uso de las tecnologías digitales. El propósito del artículo es analizar la adaptación de la enseñanza artística superior a los requisitos de la era digital moderna, estudiar la integración de las tecnologías y las plataformas virtuales en el proceso educativo a través del prisma de la formación en la enseñanza artística superior. Para lograr este objetivo, el investigador utilizó ciertos métodos de conocimiento científico, que proporcionaron un análisis temático de la literatura profesional y una comparación de las experiencias existentes con las realidades ucranianas del uso de las tecnologías digitales en la educación actoral. Como resultado del estudio paso a paso, se observó que las herramientas de las plataformas digitales y la realidad virtual están bien integradas en la enseñanza en la educación artística. Esto permite la interacción con los estudiantes de educación superior en modo remoto sin comprometer la calidad de la enseñanza y su nivel. También permite a los estudiantes crear carteras digitales y continuar su aprendizaje permanente. Las conclusiones afirman que el uso de las tecnologías digitales en la educación tiene un reto importante: la necesidad de que los profesores dominen las siguientes herramientas y las utilicen en beneficio máximo del aprendizaje.

Palabras clave: digitalización de la educación, e-learning, laboratorios virtuales, plataformas de aprendizaje en línea, tecnologías de aprendizaje a distancia.

Introduction

The development of modern digital technologies has led to changes in art education systems. The integration of online platforms and learning resources into teaching has enabled the process of rapid information exchange, analysis of the teaching styles of foreign professionals, and accelerated self-education, which has significantly contributed to the formation of new relationships in higher education institutions and art schools in general. The experience of overcoming the consequences of the COVID-19 pandemic and related quarantine restrictions has demonstrated the effectiveness of using distance learning elements in education, which has greatly facilitated the work of both teachers and students. However, the use of such methods also had certain difficulties, primarily related to gaining practical experience, since while theoretical materials could be worked with remotely, practical work, especially in groups (acting or directing), required a much higher degree of organization. This issue has become an object of attention for scholars and individual scenarios for action, which has sparked discussions among both practitioners and teachers of theoretical disciplines.

The Ukrainian realities of training students in the field of performing arts are further complicated by the Russian invasion. While in 2014 the consequences of the Russian attack were localized, the aggression of 2022 proved devastating for both the state mechanism in general and the education sector in particular. At the same time, the relocation of educational institutions, the establishment of remote work, and the resumption of educational activities made it possible to continue the educational process. The active use of digital platforms has made it possible to draw attention to the foreign experience of European countries, which has made it possible to use the best new practices. In combination with the Ukrainian experience, this opened up opportunities for a new understanding of many components of acting. However, this issue will require additional interpretation since many aspects of teaching and learning with the use of the latest technologies in art education are still underestimated and require additional interpretation.

The purpose of the article is to study the adaptation of higher art education to the requirements of the modern digital era, to analyze the integration of technologies and virtual platforms into the educational process through the prism of training, and, first of all, to train future specialists in the field of performing arts in modern conditions.

Therefore, the structure of the article consists of several sections. First, a literature review is carried out, in particular, it is established that in modern literature various aspects of the use of virtual technologies are emphasized, followed by a description of the main results that demonstrated the role of virtual platforms for optimizing learning. After that, in the discussion, the obtained results are compared with the conclusions of other researchers. It was determined that in scientific opinion experts recognize the effectiveness of using digital resources and innovative technologies for teaching art. The conclusions emphasize the importance of virtual and augmented reality, 3D platforms for modern students of art education.

Theoretical Framework or Literature Review

Researchers have been looking into how beneficial modern technologies are in educational settings more and more because of how widely they are used. Researchers contend that while cutting-edge technologies play a critical role in forming the workforce of the future, they cannot be separated from the modern learning environment (Cherusheva et al., 2023; Sofilkanych, 2022). This claim is especially true in the field of art education, where there is a close relationship between theoretical understanding and real-world application. But rather than offering particular case studies or empirical detail, these works mostly offer an overview and theoretical underpinnings.
Using a thorough examination of European experiences, Lavrentieva, Spolska, Korol, Markovskyi, and Tkachenko (2023) identified important developments in the education of professionals working in the arts and culture. Although their work is insightful, it cannot be applied outside of Europe.

Similarly, Datsko (2023) examined the impact of higher education reforms on art education in Ukraine, providing a detailed contextual analysis but focusing primarily on systemic changes rather than pedagogical practices.

Studies by Bermes (2022) on choral art and Harbuziuk, Lavrentii, Roy, Rosa-Lavrentii, and Tsyhanyk (2023) on theatre education highlight specific art forms within the Ukrainian context. These works offer rich historical and contemporary perspectives but are restricted by their narrow focus and limited scope. Karas, Romaniuk, Novosiadla, Obukh, and Zvarychuk (2021) discussed the implementation of innovative technologies in music education, yet their study is hampered by a small sample size and general findings, which may not reflect broader trends.

Moreover, Poutiainen and Krzywacki (2023) explored the role of virtual reality in music teacher education, while Iyuan (2023) investigated the innovative potential of modern technologies in humanizing art education. These studies underscore the transformative potential of digital tools but often lack comprehensive empirical validation. Sovhyra, Ivashchenko, Strelchuk, Pyvovarova, and Tykhomyrov (2023) identified key technologies in training performing arts professionals, providing practical recommendations but again, their findings are context-specific to Ukraine. The work by Sermet and Demir (2020) on virtual and augmented reality offers theoretical insights into these technologies' applications but does not sufficiently address their practical implementation in art education. Overall, while contemporary scholarship provides a broad understanding of digital and innovative technologies in art education, there are significant limitations. Many studies suffer from small sample sizes, limited geographical focus, and general overviews rather than in-depth analyses. Thus, contemporary scholars have tried to comprehend in detail various aspects of the use and implementation of digital innovative technologies in the training of art professionals. This is an important limitation that leaves unexplored points for the implementation of this study. However, the issue of integrating digital technologies and virtual reality for performing arts professionals through the prism of an integrated approach has not been fully explored. Future research should aim to include larger, more diverse samples and focus on empirical studies to ensure broader applicability and validation.

Therefore, by incorporating digital technology and virtual reality into performing arts practitioners' training in a complete and holistic method, the current study aims to close these gaps. This study intends to provide a more thorough, contextually rich, and empirically validated analysis by expanding on the corpus of previous research and providing useful suggestions and insights for transforming art education in the digital age.

Methodology

This study attempts to characterise the role of the integration of innovative technologies in the training of arts professionals, with a focus on the importance of these technologies for future performing arts professionals. With this in mind, this paper is a qualitative study and is based on a critical analysis of the literature.

Data collection

Data collection was carried out in stages. At each stage, the literature was carefully selected and analysed. In particular, at the first stage, keywords such as "art", "Ukraine", "digital technologies", "virtual reality", "e-learning", "performing arts", "actor training", "development of directors and producers" were entered into the search databases. A total of 145 results were obtained. These results were subjected to a superficial analysis, in particular, works by Russian authors and works older than 10 years were excluded. This left 60 relevant works.

Next, each abstract was critically analysed, followed by an analysis of the results of the work itself. This left 30 comprehensive papers that are important for this study.

The criteria for including the literature were based on the following parameters:

1. Relevance. Only up-to-date literature that highlights new relevant trends is considered.
2. Written in English, some works are included in other languages. But preference was given to English-language content.
3. Indexing in modern scientometric databases and availability of DOI.
4. The study describes in detail how the results were obtained, i.e. the methodology of the study.

Exclusion criteria:

1. The study does not describe art education.
2. The study does not characterize modern training methods.
3. The research is written in languages other than English.
4. The research does not describe the stages of its implementation and there is no methodology.

Data Analysis

The initial phase involved open coding, where data were reviewed line-by-line to identify relevant themes and patterns. Texts mentioning "virtual reality in art education" or "online performance tools" were highlighted. In the next phase, focused coding was used to refine and categorize the initial codes into broader themes. For example, initial codes related to different technological tools were grouped under a broader theme such as "innovative technologies in art education.

The study is based on the comprehensive application of modern methods of comprehending knowledge. In particular, the main trends and topics that are mainly mentioned in the literature on the training of

specialists in the artistic field were characterised using thematic analysis. After that, the material obtained during the thematic analysis of the problem of using technology in the performing arts was systematised and classified. The deductive method was used to highlight the main innovative technologies and methods for the development of art education and to systematise the main studies on this issue.

Results and Discussion

The COVID-19 pandemic has shaped new learning environments, making the process of adapting digital educational technologies for use alongside the traditional education system almost the only possible option for implementing learning activities. The newest challenge has led to the formation of completely new educational environments that still recognise possible ways for the further development of artistic higher education institutions. The conceptuality of the search for and implementation of the latest educational strategy required an understanding of the paradigmatic foundations of Ukrainian cultural and artistic education and science, which have developed significantly with the use of integrative capabilities of information and communication technologies and the cultural and artistic field.

An important feature of the transformation processes of contemporary stage art is the integration of innovative digital technologies into the usual artistic space in order to create exciting and new performances of the twenty-first century. The equivalence of audio and visual elements of the contemporary stage space within the framework of shaping the audience's creative imagination and influencing its consciousness has been taking on different manifestations and forms throughout the development of theatre art (Prior et al., 2015). As a result, there are now many possibilities for integrating innovative visual and tonal effects to create exciting and complex performances on stage. For this reason, digital technologies have become an important tool in the creative process, opening up not only new perspectives but also creative opportunities for set designers, directors, producers, choreographers, and actors. At the same time, the semantic ambiguity of innovative stage productions is a phenomenon of a specific space of the stage text, which is based on various manifestations of the cultural and historical space of postmodernity (Proskurina & Nikitina, 2023). The individual artistic vision of each stage director, producer, set designer, or actor contains the visions, perceptions, and needs of contemporary society that form new content (i.e. digital). So, nowadays, there are performances, shows, concerts that are impossible without the use of technical tools and means.

Modern researchers classify them as follows:

1. Events, performances, concerts based on multimedia technologies.
2. Interactive performances and immersive theatre.
3. Laser or pyrotechnic performances.
4. Vocaloid show.
5. Singing fembots and the use of robotics.
6. Virtual tours to pop performances and virtual theatres.

Thus, modern art education should be aimed at integrating modern innovative technologies into the training of specialists who should understand modern technologies and build their own careers based on their use.

One of the important aspects used in art education at the present stage is the introduction of game technologies that significantly complement and improve audiovisual art education (Morris, 2016). This, according to scholars, makes it possible to overcome difficulties in training film and performing arts professionals, which was also pointed out by potential stakeholders in their assessments of educational and research training programmes, emphasising the need for further modernisation of established traditions. Collective ways of creative work in acting training are actualised by team forms of play that allow groups to work with the active involvement of thinking and mental activity.

In order to achieve the required learning outcome (the overall aesthetic appearance of the actor and his/her emotions and abilities, which in turn, through successful interpretation of the text and action, makes the desired impression on the audience), the teacher must constantly monitor the performance activities of the students. The combination of traditional approaches to education and the use of interactive and problem-based learning methods contribute to the realisation of the goals of artistic education, the acquisition of necessary knowledge by students, and the mastery of real technical skills. Although, according to researchers, organising group classes to train performing skills, such as a choreographic or acting class, is a rather difficult process in the context of distance learning and the use of digital technologies (Santos López & Torrente-Patiño, 2020).

First of all, there are certain limitations on the possibilities of collective control over the acting work of students, distortion of sound during the broadcast due to slower transmission (technical challenges, lack of reliable Internet connection due to active hostilities, difficulty in establishing interaction with other participants, etc.).

To overcome such challenges, teachers use new forms and methods to achieve maximum interaction at the level of all members of the cast. In today's digital environment, participants in the educational process are usually outside the classroom and do not have direct contact with each other.

Rehearsals and practice sessions can be conducted on ZOOM digital platforms, and researchers classify such a session as a video lesson. Its structure is usually standard: introduction, content, questions and answers, and performance training. Opportunities for continuous interaction through remote technologies are beneficial for students and the teaching team, as in martial law, classes can take place at a convenient time, ensuring that the continuity of the educational process is not disrupted (Velychko-Semennyk et al., 2022). It is also important that a virtual actor group created using a digital platform is easily accessible to all subjects of the educational process at any time and in any place. Teachers propose the formation of a digital class using the following algorithm: familiarisation with the acting episode by watching the relevant video recording; paying attention to the peculiarities of each actor's performance in the analysed scene; practical work on recreating the scene, analysing the results and mistakes (Labunets et al., (s.f)). This technology also allows students to create their digital portfolio from scenes known to the general public. For employers, posting or transmitting such data online is extremely useful as it allows graduates to showcase their abilities and skills.

As an example, Kyiv National I. K. Karpenko-Kary Theatre, Cinema and Television University offers a combination of deep teaching traditions (the university was founded in 1904) and the use of modern state-of-the-art digital technologies aimed at training top-level specialists in the field of acting and theater. The university conducts regular annual evaluations of the activities of not only students, but also teachers, and forms a corresponding rating that allows to identify and attract the best teachers. The main focus is on practical disciplines that help to improve the performance skills and artistic development of the student body. Scientific and theoretical work is also regularly carried out, which makes it possible to compare the results of the university's scientific and pedagogical team with the best results of other institutions in Ukraine and the world.

Also, we can describe the educational process at the Kyiv National University of Culture and Arts. This is a detailed and organised system of didactic activities that contribute to the implementation of the content of education and the formation of modern conditions for the further development of students, their artistic and creative self-realisation, and the acquisition of patriotic and universal values. The main tasks that are being actively implemented include creating accessible opportunities for young people to receive quality art education, preparing them for the real conditions of professional activity, obtaining lifelong learning, developing and implementing innovative educational technologies in professional work, and democratising

the educational process. In particular, Kyiv National University of Culture and Arts actively uses digital distance learning technologies in acting training. This allows all participants in the educational process to interact fruitfully, work individually and in groups. Digital learning for students is carried out using Internet communication tools, including those integrated into the educational process management system (Moodle), e-mail capabilities, certain popular messengers, video conferencing platforms (for example, Google Meet and others). An important aspect of learning is self-education, which is obtained by watching relevant training videos created by the institution's teachers and working with special educational platforms (e.g. Prometheus).

Various media technologies are used in the training of performing arts professionals in Ukraine, which open up opportunities for the creative disclosure of a particular idea. For example, some film and photo documentaries allow us to feel the reality and authenticity of an artistic performance. At the same time, the incredible multimedia interaction between the hero and the actor helps to create a sense of the atmosphere of the action. In such situations, students interact with animated fragments. The colour and light design of the performance, computer projections, or the use of three-dimensional computer graphics, all combined into one system, help to create a sense of creativity and imagination in future artists. The student's imagination goes beyond the usual limits and becomes more effective. The question arises as to the correlation between multimedia in education and traditional methods. However, it is clear that the unique potentialities of combining various "environments" and the characteristics of technological interactivity make it possible to develop practical skills in students. In this context, virtual technologies, which are actively used in Ukrainian educational institutions, are also becoming important. The use of virtual reality in the training of performing arts specialists helps to open up opportunities that improve the learning process and develop professional skills. European universities, including Ukrainian ones, use various simulation technologies based on virtual reality. In particular, students use special virtual stage platforms to develop their acting skills, experiment with selected roles and scenarios. It also helps to develop skills of cooperation with the audience and stage space.

An important part of the introduction of virtual reality in Ukrainian universities is the use of interactive lessons and simulators. In particular, with the help of virtual reality, teachers create various interactive lessons that influence the development of practical acting or directing skills. In addition, virtual technologies facilitate the organisation of various kinds of remote performances for students anywhere. With the help of distance learning programmes, teachers or invited professionals can give a lecture from anywhere in the world. Figure 1 summarises the main aspects of using virtual reality in the training of performing arts professionals. The use of virtual technologies in the training of performing arts professionals helps to make learning more effective, engaging, and accessible and promotes the development of creative thinking and innovative approaches to performing arts.

Virtual reality technologies can be important not only for teaching certain practical disciplines but also for teaching the history of theatre. These technologies serve as a medium for introducing a visually enhanced reenactment of ancient theatre events and artefacts. Virtual reality can provide a wide variety of learning materials, but also encourage interactive research among students, engaging them in the process of acquiring new knowledge and skills (Losheniuk et al., 2023). Such learning environments facilitate the engagement of learners, both imaginatively and intellectually, in a wide range of varieties and potential ways of interpreting learning data.

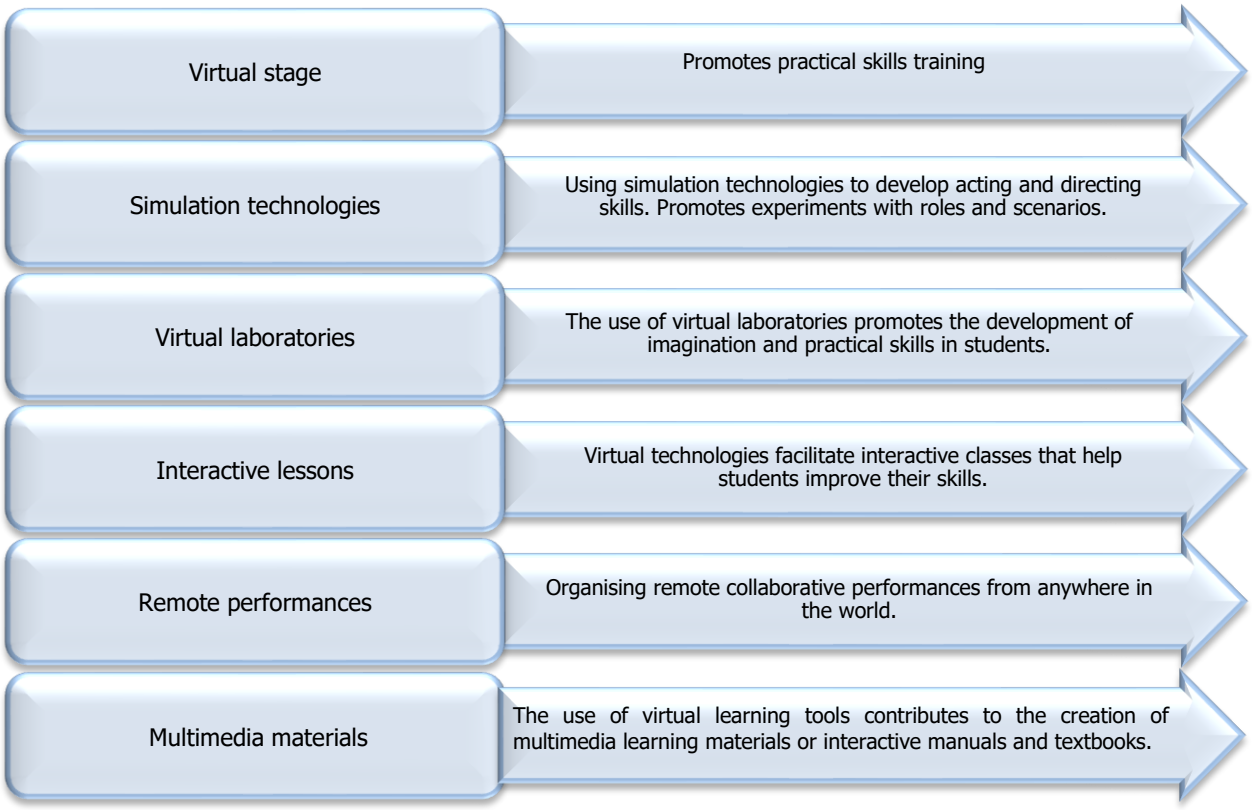

Figure 1. The main aspects of using virtual reality in art education.
Source: compiled by the authors

This type of interaction goes far beyond the established methods and forms of learning. At the same time, the use of innovative visualisation methods in teaching, such as 3D simulation or virtual image synthesis with hypertext resources, improves not only the transfer of knowledge but also the development of practical skills in future performing arts professionals (Williams et al., 2021). However, it should be noted that such digital reconstructions should be based on detailed explanatory information from the teacher. At the same time, the latter should also be perfectly proficient in modern virtual reality technologies (Afanasieva, 2023). The integration of virtual reality simulations into the training of art professionals has been shown to improve learning by enabling students to interpret various theatrical models or film artefacts creatively and intellectually (Goian et al., 2023).

In general, stage education has always been in the prism of a balance between the rules of theory and practice. As a rule, the process of visualising the space of a performance, its decorative elements and ornaments, costumes, and, of course, certain stage aspects are in the space of technical interaction (de Valck, 2013). Existing modern training programmes for art professionals emphasise the importance of integrating modern innovative technologies and methods.

Figure 2 presents the main aspects of stage education based on modern innovative technologies. They extend the boundaries of a modern theatre, directing, or producing class, which contributes to a personalised approach to the training of such specialists.

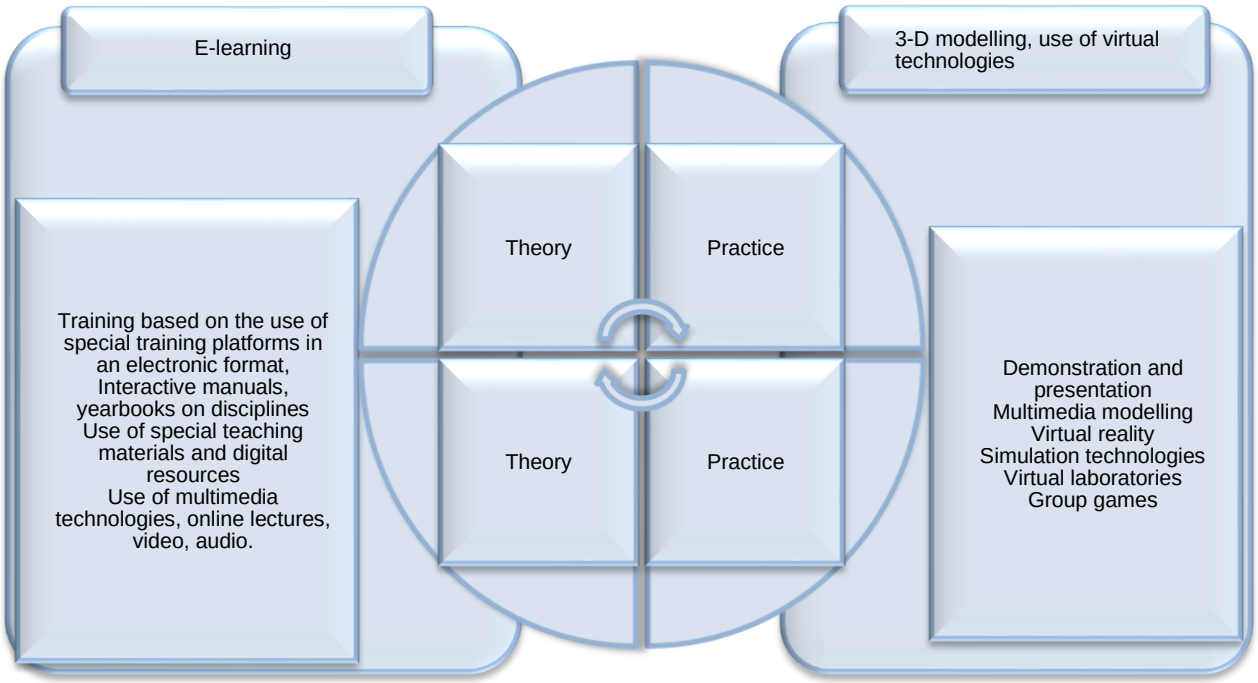

Figure 2. The main aspects of stage education (based on the use of innovative technologies). Source: compiled by the authors.

Thus, the use of modern technologies in the training of performing arts professionals and their integration into practice and theory involves the implementation of innovation in the modern educational environment, shifting traditional methods of knowledge transfer and synthesis towards a more visually enhanced experience, which is important for future actors, directors or producers.

Discussion

The results of the study made it possible to establish that digital technologies are well adapted for use in art education, in particular in the training of specialists in the field of performing arts. In particular, the effectiveness of involving virtual reality in teaching has been established, and the use of special educational portals and software that allows teachers and students to communicate effectively has also had a positive effect. The proposed research findings confirm the views of Panyok (2023) on the effective combination of game-based learning models with modern digital technologies. It is worth agreeing with, who note that games and modelling of various real-life situations and processes, including those using virtual reality and modern digital technologies, are particularly effective in this regard. Some gaming aspects of the work accompany the training of acting and stage skills during regular practical classes that offer simulations of various stage situations during filming or performance, work in the video and sound editing room, studio or editorial work, etc. Similarly, the gaming capabilities of digital learning technologies make it possible to combine theoretical learning with the acquisition of the necessary practical skills, and for students to learn in practice certain professional tools and techniques, gaining some effective experience from performing creative and production activities. The proposed results support the high efficiency of the use of game-based teaching methods. In particular, digital gaming technologies contribute to better testing and development of individual patterns of behaviour with appropriate involvement in the opportunities of the future professional environment.

The proposed results also confirm the findings of scientists about the importance of using virtual reality to improve the adaptation of students to artistic acting. In particular, Wang et al. (2023) determined that under quarantine restrictions, it is important to support the collective work of students, which is implemented through the use of digital learning technologies. 3-D simulation technologies and virtual laboratories contribute to the development of practical skills, creative thinking, and the ability to hone individual problems in executive work. At the same time, it is difficult to agree with the conclusions of Radomska & Ponkalo (2023) that the combination of modern technologies with the educational process in art education does not lead to the desired effect because Internet technologies distract students more than they benefit them. The proposed results confirm another scientific point of view, according to which the adaptation of modern digital opportunities is a natural phenomenon in education and requires a comprehensive approach, given its proven effectiveness (Brown & Duffy, 2013; Van de Kamp et al., 2014).

However, such a discussion will continue, as effectiveness depends not only on technologies and methodologies but also on the desire of students to learn and their abilities, which can lead to different results under equal conditions of access to technology. The proposed study also has certain limitations. First of all, it is the fact that the most recent publications on incense issues were used for its implementation. This has left out the scientific studies of researchers more chronologically distant, although their conclusions may also be relevant for further research. Also, primarily publications in English were taken into account, as an important criterion for selecting scientific literature was the presence of the publication in scientometric databases and search engines. Obviously, the teaching experience is also published in foreign-language scientific studies. Therefore, a promising area for further research is the use of comparative analysis and the search for additional information to assess the state and prospects of art education.

Conclusions

Martial law and the introduction of distance education have demonstrated that even in crisis situations, there are ways to overcome challenges. One of the important tools in this process for art education is the adaptation and active use of modern digital technologies, which offer both unique characteristics and tangible advantages.

The effective functional features and characteristics of game-based learning underscore the importance of integrating digital technologies in both theoretical and practical training in art education. To enhance the quality and modernize art education in line with current production capabilities, it is proposed to blend traditional game methods with the latest innovations generated by the digitalization of education and society. Social networks and internet platforms facilitating real-time communication have emerged as viable alternatives to traditional classes, fostering the development of essential skills.

Even with these improvements, there is still a big problem with actual interaction. Using digital virtual reality technologies, which offer chances for immersive learning and the development of specific acting and performing arts skills, can help with this. Hypertext materials should be combined with cutting-edge tools like 3D simulations and virtual environments to improve knowledge transfer and the development of useful skills. Nevertheless, thorough teacher preparation and their capacity to integrate contemporary digital tools into their instructional strategies are prerequisites for the productive use of these technologies.

The current study has several drawbacks. The primary focus was on recent publications, which may have excluded important findings from earlier studies that are still relevant today. Furthermore, the literature selection was skewed in favor of English-language works that were featured in scientometric databases, which may overlook valuable from research published in other languages. Future studies should aim to

incorporate a more diverse range of sources, including non-English publications, to provide a more comprehensive understanding of art education globally.

Future research should strive to include a wider variety of materials, such as publications written in languages other than English, in order to offer a more thorough picture of art education around the world. Subsequent investigations ought to delve into the enduring effects of digital technology on art education, scrutinizing the ways in which these resources influence the academic achievements and career advancement of learners across diverse cultural settings. Studies that compare various nations and educational systems could provide important information about how well digital advances work in various contexts. Further research into the ways in which emerging technologies, including augmented reality and artificial intelligence, could improve art instruction is also beneficial.
In conclusion, even though digital technologies have a great deal of potential to transform art education, their effective application necessitates careful consideration of numerous factors, including teacher training, practical application, and inclusivity of diverse research perspectives. By addressing these challenges and continuing to explore innovative solutions, the field of art education can continue to evolve and thrive in the digital age.

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