

# The Use of Virtual Reality in Art Education in Ukraine: A Study of the Impact on the Creative Process and Students' Perception

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Received: May 17, 2024

Accepted: June 13, 2024

Online Published: July 12, 2024

doi:10.5430/jct.v13n3p32

URL: <https://doi.org/10.5430/jct.v13n3p32>

## Abstract

**Purpose:** The study aims to explore the role and application of virtual reality in art education in Ukraine, to analyse the impact of this technology on the creative process of students pursuing higher education in the field of fabric and clothing design. The aim is also to provide a brief overview of the principles of modern art education in Ukraine and to highlight the role of virtual reality in education, including design, based on empirical research. **Methodology:** The study involved 37 students studying at the Department of Textile and Clothing Design, who are studying certain disciplines in the Conceptual Design programme. Quantitative and qualitative analysis of the data obtained was used, including statistical analysis in characterising the frequency of use of virtual reality technologies and qualitative thematic analysis of interviews. **Results:** The study indicates the active use of virtual reality in art education in Ukraine, in particular, it highlights that 86.5% of students consider the impact of virtual reality on their creative process to be positive, and 89.2% believe that it improves their conceptual design skills. The study also revealed the benefits and challenges of using artificial intelligence and virtual reality in art education. The conclusions emphasise that modern Ukrainian art education actively takes into account technological trends, using new digital learning solutions. The results show a positive impact of virtual reality on the creative process and conceptual design skills of students. However, the use of artificial intelligence and virtual reality raises ethical and technical challenges that need to be carefully addressed for maximum benefit and harmony with the artistic process.

**Keywords:** innovative technologies, art, design, training, creativity, Ukraine

## 1. Introduction

In today's world, where the speed of technological change is opening up new horizons in all spheres of human life, art and education are not left out of this epochal development. One of the key innovations that transforms learning processes and opens up unlimited opportunities for creative development is the use of virtual reality (VR) in art education. Virtual reality is becoming not just a technological tool, but a real medium that enriches the learning process of art education. Its potential lies in the ability to create an immersive environment in which students can not only observe but also interact with artworks, experiment, and reveal their creativity in a new dimension. Therefore, this article is devoted to the study of the impact of virtual reality on art education, as well as to the identification of those aspects that contribute to improving the quality of students' creative process and their understanding of art in general.

### 1.1 Research Problem

At the same time, the use of virtual reality in art education in Ukraine is still an extremely relevant issue. In particular, cultural peculiarities can influence the perception and adaptation of virtual reality in art education. A study of this aspect can help determine how virtual reality fits the specifics of Ukrainian culture and artistic heritage. It is also important to determine how the use of virtual reality affects the creative process of art students in Ukraine. This includes analysing whether the technology contributes to the development of their creative potential and whether it changes the perception and interpretation of art. There is also the issue of implementing the latest digital solutions and studying the difficulties faced by educational institutions and teachers in introducing virtual reality into the learning

process, especially in the context of Ukrainian education. Researching these issues can expand the existing understanding of the interaction between virtual reality and art education in the Ukrainian context and identify areas for further innovation and improvement in this area.

It is important to note that researchers have addressed this issue only partially. In particular, the methodology of using artificial intelligence in art education was analysed by González-Zamar and Abad-Segura (2020). A senior review of the state of the art was conducted by Häkkinen et al. (2018). Cabero-Almenara et al. (2022) traced the evolution of the use of virtual reality in teaching art history. A similar problem was also addressed by Schneider and Rohmann (2021), who identified the features of the use of digitalisation in the educational process. Su and Zhong (2022) traced the possibilities for the use of artificial intelligence in primary school, making valuable comments on their application in further education, including higher education. Zhang et al. (2022) reviewed current trends in art education and teaching based on artificial intelligence. West and Burbano (2020) raised questions about the use of machine learning in art and design, taking a critical look at the role of intelligent systems in art and design education. Liu et al. (2021) explored the interaction of multimedia and virtual technologies in art education. Makhkamova et al. (2020) conducted a systematic review that proposes a taxonomy of virtual reality use in education, including opportunities for art education. Hanna (2023) examined the use of the artificial intelligence-based art generator Midjourney in creativity and advertising. In the realm of brand development, Martynenko et al. (2023) emphasizes the crucial role of design in enhancing brand identity and value congruence within economic sectors. This insight can be applied to the educational use of technological tools like virtual reality, which helps shape immersive experiences and engagement in learning. Familoni & Onyebuchi (2024) reviewed the current state of AR/VR in U.S. education, highlighting significant improvements in student engagement, motivation, and comprehension. The authors predicted a growing adoption of VR technologies, driven by advancements in hardware and software, and increased accessibility. Parshyn (2024) researched the role of gamification in modern Ukrainian education. Chien & Hwang (2024) differentiated between broad (holistic integration of VR, AR, AI) and narrow (specific applications of VR) perspectives in educational contexts. The integration of VR with established pedagogical theories enhanced its effectiveness, emphasizing the need for a theoretical framework in VR-based education. Maroungkas et al. (2024) highlighted the ability of VR to provide personalized learning experiences, catering to individual student needs and learning styles. Hutson and Olsen (2022) presented a case study of the use of virtual reality in art history education. These articles make an important contribution to understanding the impact of artificial intelligence on art education, highlighting key topics such as adaptive learning, interactive methods, the use of virtual reality, and artwork creation.

### *1.2 Research Focus*

The significance of this study is to expand the understanding of the possibilities and limitations of using virtual reality in the context of art education in Ukraine. To do this, it is important to find out how this digital solution affects the development of students' creativity, whether it facilitates their creative process, and whether it introduces new aspects to the perception and understanding of artistic concepts. In addition, it is equally important to consider the benefits and challenges faced by teachers and students when implementing virtual reality technology in the educational process. The proposed study can serve as a basis for further development and improvement of the use of virtual reality in art education, as well as determine the prospects for integrating this technology into the art curricula of Ukrainian educational institutions. In particular, the use of virtual reality technologies in education is a powerful tool for creating engaging and effective curricula, as seen in the example of the Conceptual Design educational programme taught at the Department of Fabric and Clothing Design at the Kharkiv State Academy of Design and Arts.

### *1.3 Research Aim and Research Questions*

The purpose of the article is to study the role and application of virtual reality in art education in Ukraine, to analyse the impact on the creative process of higher education students. To achieve this goal, the article offers an overview of the following issues: a brief overview of the basic principles of modern art education in Ukraine, highlighting the role of virtual reality in teaching design and art based on an empirical study.

## **2. Materials and Methods**

### *2.1 Participants*

The object of the study is 37 students studying at the Department of Textile and Clothing Design and receiving design education. All participants are studying separate disciplines in the "Conceptual Design" programme. While studying this discipline, they gain experience with some innovative technologies, for example, with AI-neural networks Midjourney and Leonardo.

## 2.2 Sample Procedure

The sample will include all students (N=37) who study the peculiarities of using modern technologies in professional art education based on the Conceptual Design programme and have already worked with AI and virtual reality technologies.

Inclusion criteria:

1. Students who already have experience with innovative technologies
2. Students should have a basic level of experience in the use of AI. This includes the ability to work with technology interfaces and an understanding of their potential in the context of conceptual design.
3. Speciality - clothing and textile designers
4. Understanding of the Research Objective:

Participants should understand that their participation will help to explore the impact of virtual reality on the creative process in art education.

These inclusion criteria helped to ensure the representativeness and objectivity of the study, as well as to ensure that the participants had the necessary knowledge and experience to study the impact of virtual reality on their work.

The selection was consensual. An invitation to participate will be sent by email, where students will be provided with information about the purpose of the study and asked to provide consent to participate. Students who expressed a desire to participate will be asked to consent to participate in the study.

## 2.3 Data Collection

### 1. Introductory questionnaire

- Before starting the study, students will fill out introductory questionnaires that will ask about their experience with virtual reality and expectations from the research.

### 2. Learning from previous experience

- Collecting and analysing information about participants' previous experience in using modern technologies

### 3. Conducting the Study

- Participants will be involved in the study by completing conceptual design tasks using virtual reality in the experimental group.

During their studies, students will be involved in the study of current and traditional technologies for visualising an artistic idea, innovative technologies in the fashion industry, digitalisation of fashion, graphic image editing tools (in particular, technical drawing, figure), graphic image editing technologies (clothing fabrics).

### 4. Observation and recording of results

- Observing how students work with virtual reality and recording the results, such as time on task, creativity, etc.

5. The study also included a separate interview with a focus group to determine the impact of virtual reality on the development of the creative process. In general, at this stage, it was found out how modern students relate to the use of technology in their professional activities.

6. At the end of the study, the students completed the main survey, and the data was collected and analysed using quantitative and qualitative methods. Below are the sections of the survey and the main research questions.

#### 1: Using virtual reality in the learning process

How often have you used virtual reality technologies in your studies?

What are the benefits of using virtual reality technologies in education?

What specific tools or platforms have you used? (e.g., Midjourney, Leonardo, etc.)

#### 2. Study of the creative process

D. How do you assess the impact of virtual reality on your creative process?

- Very positive
- Positive.
- Neutral

- Negative
- Very negative

E. Do you think that using virtual reality improves your conceptual design skills?

- Yes
- No.
- Not sure/undecided

### 3. Perception of technology

F. How do you rate the usability of virtual reality in your design tasks?

G. Do you think virtual reality can replace traditional methods in conceptual design?

### 4. Overall impression (description of the overall impression of using virtual reality).

This procedure provided a systematic and structured approach to collecting and analysing data on the impact of virtual reality on students' creative process.

#### 2.4 Data Analysis

The data obtained were processed using quantitative and qualitative analysis. Statistical analysis was used to characterise the frequency of use of virtual reality technologies and to describe students' attitudes towards these technologies. Qualitative thematic analysis was used to analyse the interview data. At the same time, the data obtained were combined with the results of modern researchers, and key findings on the issue under study were made through integration.

## 3. Results

### 3.1 Transformations of the Ukrainian Art Education System: General Remarks

Art education in Ukraine has its own history of functioning for more than a century. Kharkiv State Academy of Design and Arts is one of the oldest art educational institutions in Ukraine. Back in 1869, a private art school of M. Raevska-Ivanova was opened in Kharkiv. In view of the transformation of Kharkiv into a large industrial centre, the school chose the artistic and industrial direction, thanks to which the foundations of Ukrainian design were formed. Over 27 years of activity, the school has educated about 900 students. In addition to the mass of specialists who devoted themselves to applied art, future famous painters and architects studied here. The beginning of higher art education in Kharkiv was laid in 1921. A system of artistic and industrial education was developed, the key principles of the organization of which determined the basis of the formation of the professional training system and its content. During the formation of the art education system, valuable scientific, methodological, and organisational experience was accumulated, which ensured the professional qualification of specialists. A network of creative workshops and performing academies headed by prominent artists was created. It is important to note that the methodology for developing the educational process in art schools had its own unique specifics and systemic principles that distinguished it from the well-known educational standards typical of technical or humanitarian educational institutions that trained specialists in mass professions. Among the key principles were a personality-oriented approach aimed at developing the student's inner potential and forming his or her individual value consciousness; correlative and practical connections between different specialities and areas; mentoring, which consisted of developing practical skills in students under the guidance of a performing teacher; and important attention was paid to the practices of socio-cultural activities. At the same time, in Soviet times, the development of art education in Ukraine faced problems that were difficult to solve in the context of the total centralisation of the education management process and the unification of the basics of methodological support (Ivanenko, 2017). At the same time, the organisation of the educational process and the development of curricula have always been under strict state control. All curricula for different disciplines and teaching materials were actively developed in the capital of the former USSR, Moscow, or, sometimes, by prominent methodologists in the capital of Ukraine, Kyiv. Before the introduction of methodological literature into the educational process, it was discussed, tested, and verified. However, such a centralised and unified approach to the education system caused delays and sometimes complicated the process of updating the educational process, hindered the introduction of innovative teaching methods, and negatively affected the learning process due to the strong ideological dependence of the educational material.

In the 1990s, when Ukraine gained its independence, significant transformations in the development of art education took place. Higher education institutions gained more autonomy in determining the content of education and the

direction of their development. New types of educational institutions have emerged that are more diverse in their structure and flexible in their teaching methods. These institutions are able to respond quickly to the requirements of the modern world. In line with current educational trends, such institutions have reoriented the educational process towards innovation, which has contributed to the opening and emergence of new specialisations, such as audiovisual art, photography, etc.

Institutions of classical art education in Ukraine, in particular, art academies in Kyiv and Lviv, also underwent a transformation. For example, the introduction of specialized educational and scientific programs determines the educational process through a number of approaches and methods aimed at the personal development of the student. Among them, student-centered learning, self-learning, problem-based learning, and the use of pedagogical and lecture-performance practice play an important role. This approach involves a combination of individual, practical, and lecture classes, creating the basis for continuous self-development and lifelong learning, fully in line with current educational trends. Also important is the material and technical base for the full-fledged educational process. In order to fulfil the objectives of the Master's programme and organise various types of training and practical classes, the institution has the necessary infrastructure and resources to provide a wide range of educational services in the field of art. At the same time, an extensive block of compulsory and elective courses provides a broad overview of both practical and theoretical aspects of training.

At the same time, modern Ukrainian art education takes into account the latest technological trends, and teachers are actively using the latest digital learning solutions. Accordingly, new educational and professional programmes are being created and actively developed. For example, at the Kharkiv State Academy of Design and Arts, the Department of Fabric and Clothing Design, through the implementation of the Conceptual Design programme, the use of artificial intelligence capabilities to perform specific tasks is stipulated, within which the search and testing of experimental approaches to teaching students is carried out (Educational and scientific programme Conceptual art 2023). The experience of the proposed institution can be useful for analysing the use of virtual reality in art education.

### *3.2 Using Virtual Reality as a Transformational Tool in the System of Art Education Development*

#### **Case Study: Kharkiv State Academy of Design and Arts**

**Background:** Kharkiv State Academy of Design and Arts has pioneered the use of VR in design and art education. The academy's VR initiatives are aimed at preparing students for the future of digital art and design.

#### **Implementation:**

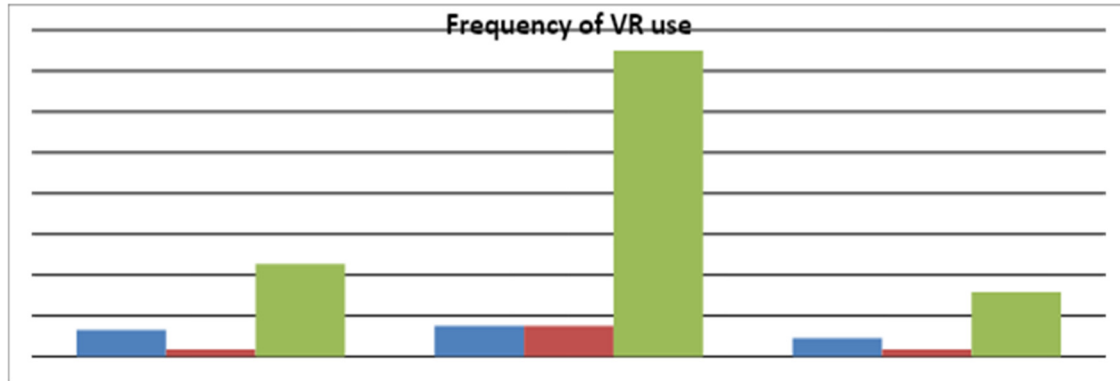
**The process of ethics Integration.** All VR-related courses at KSADA incorporate ethical issues. The impact of digital art on society, appropriate VR use, and moral conundrums in virtual environments are among the subjects covered.

**The process of accreditation and Evaluation.** Reviews as part of the academy's continuous improvement approach. This guarantees that the VR program will develop in accordance with ethical norms and improvements in education.

#### **Impact on Art Process:**

- By simulating real-world design problems, VR technologies helped students improve their problem-solving abilities.
- Students were able to see their artistic practice from fresh angles and with new insights thanks to the immersive VR experience.

In the field of art education, virtual reality (VR) is emerging as an important tool that is redefining the way designers conceptualise and interact with their creations (Peni and Dewi 2023). Defined as an illusion of reality, VR relies entirely on computer systems and is in increasing demand across a variety of artistic disciplines. This technology opens up a new dimension for design education and specific artistic practices, allowing the creation and editing of 3D models, mechanisms, environmental objects, and structures. The students said that they mostly use virtual reality up to 10 times a month (15 students), several times a week (3-4 times) - 13 students, and several times a month - 9 students. To process this data, let's calculate the total number of students and the number of times they use virtual reality technologies (see Figure 1).



**Figure 1.** Diagram of VR Usage

Source: compiled by the authors

From this data, we can determine the total number of uses: 227 times. Thus, students use virtual reality technologies approximately 227 times in their studies. This works out to about 6 times per student per month.

The widespread use of virtual reality technologies contributes to the creation of a dynamic and interactive environment for training design and art professionals. Therefore, the introduction of virtual reality (VR) technologies in the education of future design and art professionals has the potential to enrich the learning process and develop students' creative abilities. At the same time, the use of virtual reality (VR) technologies in the field of fashion design and art opens up wide opportunities for creativity and innovation (Bilro et al., 2022). For example, the use of VR allows designers to interact with three-dimensional models of their creations, which makes it easier to identify potential problems and make changes before physical production begins. At the same time, artists can use VR to create immersive exhibitions of their creations, where viewers can explore and interact with the images or exhibition elements created. It is also worth noting that designers can use VR to experiment with textures and colours without the need to create physical samples, which contributes to the efficiency of the process of developing new designs. The use of virtual reality technologies in fashion and art design opens up new avenues for creativity and learning, making the process more innovative and accessible.

In addition, VR helps to focus on the quality and properties of specific design objects. Students can delve into the intricacies of their creations with a level of detail that traditional methods cannot afford. The technology also provides an additional level of security in terms of materials and application techniques, allowing designers to experiment and iterate in a virtual space before moving to physical production. In the context of design education, VR plays a key role in shaping new forms of collaborative interaction. It bridges the gap between designer and product, offering a dynamic environment for experimentation and collaboration. It also facilitates the interaction between designer and consumer by providing a platform to showcase designs in a more immersive and experiential way.

The use of raster graphics programmes in the training of future artists and fashion designers plays an important role in the system of training. In particular, Adobe Photoshop, as a professional raster graphics editor, is of great importance in the training of future artists and designers. The programme allows students to develop skills in drawing, retouching, and creative image processing. The use of layers, colour adjustment tools, and effects allows students to create impressive graphic works, developing their creativity and ability to work with a variety of visual materials. Using the VR interface, students can virtually "immerse" themselves in the world of creativity by drawing and editing images in three dimensions (González-Zamar and Abad-Segura, 2020). At the same time, Gimp, as a free raster graphics tool, is important for creating accessible opportunities for future creative professionals. Using Gimp helps to develop skills in image processing and editing, as well as stimulates creativity in graphic design. In this system, virtual reality provides an opportunity to create and edit graphics using VR movements and interaction, which enriches the creative process.

AutoCAD, as a tool for creating technical drawings and 3D models, is identified as a key component in the training of future designers and architects. The programme helps students to develop precise and technical drawing skills, as well as to use the principles of 3D modelling to solve design problems. Using AutoCAD in virtual reality allows art and design students to move into three-dimensional space to create technical drawings and models. The VR interface facilitates spatial thinking and increases interactivity.

Julivi CLO 3D is defined as an innovative tool for modelling garments in 3D. Using this software allows students not only to create realistic 3D models of clothing but also to develop an understanding of the properties of fabrics and the

interaction of design elements in a virtual environment. Thus, Julivi CLO 3D opens up opportunities for creating masterpieces in a virtual space. The use of VR allows designers to feel and interact with the created models, providing a new level of realism and creativity. At the same time, CorelDRAW, as a vector design tool, helps to develop skills in creating logos, illustrations, and other vector graphic elements. Blender is important for those studying 3D graphics and animation. Its use allows future artists and designers to create complex and realistic 3D scenes and objects. Modern researchers, in particular, believe that in order to better align the system with the requirements of fashion designers, it is necessary to adapt the fashion design modelling function accordingly (Zhang and Jia 2021). In particular, this system uses an advanced surface patching method to create a 3D image of a garment. During the 3D modelling process, the import and reconstruction of various model information plays a crucial role. In a 3D virtual system, creating a surface mesh is a key step before presenting a 3D model. This involves creating several interconnected triangular surfaces to approximate the original surface.

The Tilt Brush tool, developed by Google, is an immersive technology for creating art in virtual space. Using VR technology, Tilt Brush transforms the environment into a 3D canvas where artists can freely experiment with shapes and colours. Based on the idea of “painting in the air”, this tool allows you to create impressive and huge art installations, using space as a platform for creative expression. At the same time, Oculus VR's Oculus Medium is a powerful tool for modelling in virtual space. By providing users with the ability to work with a three-dimensional object, Oculus Medium expands the boundaries of creativity. Based on the idea of working with clay, the tool allows for the creation of three-dimensional sculptures and models, providing artists with a means to creatively express their ideas in a virtual format. Quill, also from Oculus, is a tool for creating dynamic illustrations and animations in a virtual environment. This tool, which is based on the idea of “drawing in space”, gives artists the opportunity to freely express their creativity through the creation of lively and emotional visual stories (Häkkinen et al. 2018). Quill allows you to turn ideas into reality by adding mobility and depth to graphics. Gravity Sketch is an innovative tool for creating 3D models and concepts in a virtual space. This tool allows artists and designers to create detailed objects using gestures and movements, facilitating the design process and providing excellent opportunities for conceptualising ideas in a three-dimensional virtual space. On the other hand, active interaction with AI (Leonardo, Midjourney neural networks) plays an important role in generating images of various environments, images of the costume wearer, and the costume itself. At the same time, programs such as Leonardo and Midjourney neural networks have advanced functionality for working with design projects (Caggianese et al., 2020). It is especially important to note the speed of data processing and the possibilities of creative application: the generated images allow you to quickly implement the conceived concept, to take it as the basis for a broader design development that can be implemented in conceptual art. Figures 2, 3, 4 show the main results of students who used these virtual technologies in the learning process. Figure 3 shows the results of an exercise to find new body proportions and clothing shapes with the help of AI (post-apocalyptic fashion).



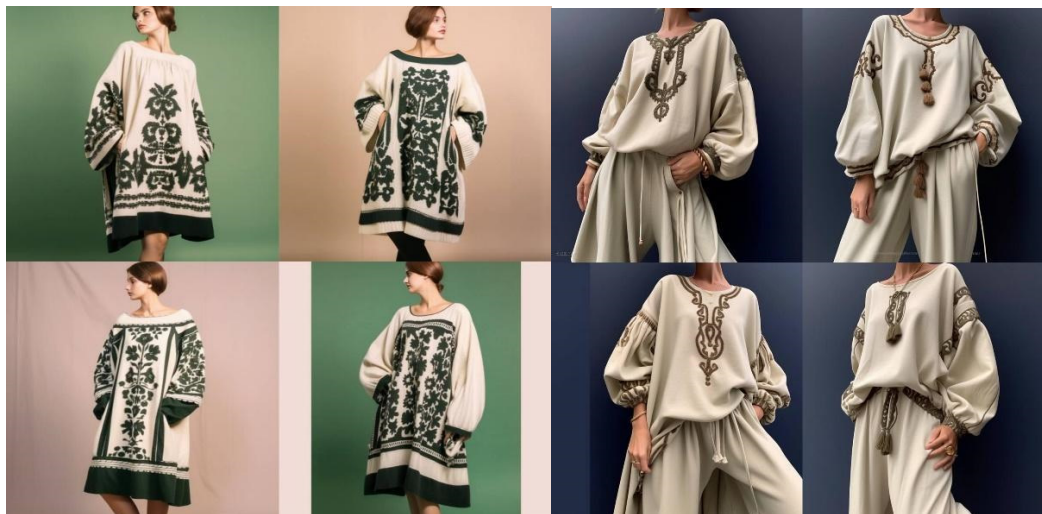
**Figure 2.** Futuristic Fashion

*Source:* Neural network foresight



**Figure 3.** Post-apocalyptic Fashion  
*Source:* Neural network foresight

Thus, Figure 3 shows the results of the AI-assisted figure proportioning exercise (post-apocalyptic fashion). This exercise allows design and art students to experiment with creating images that reflect the aesthetics of a post-apocalyptic world. AI is used to visualise and simulate the design, providing students with an interactive approach to the creative process and deepening their virtual fashion exploration. Figure 4 highlights the vision of ethnic style based on the use of neural networks.



**Figure 4.** Ethnostyle  
*Source:* Neural network foresight

Figure 4 highlights the vision of ethnicity based on the use of neural networks. This visualisation allows students to gain a deeper understanding of the impact and changes in ethnicity through the use of advanced neural network technology. This approach to learning about ethnicity allows students to analyse and experiment with different variations of styles in a virtual environment, expanding their creativity.

Thus, virtual reality plays a significant role in student training. With the help of this technology, students can learn and experiment with different aspects of their future profession, building skills and gaining practical experience in a virtual



format. Virtual reality allows for an immersive learning experience where students can interact with real-life scenarios and solve problems that reflect the real challenges of their future professional lives. This approach helps to improve creativity, critical thinking, and the ability to work in innovative areas of art and design. When asked how do you assess the impact of virtual reality on your creative process, the majority of students described it as “positive” - 16 people (see Table 1).

**Table 1.** Characteristics of the Impact of Virtual Reality on Creativity

How do you assess the impact of virtual reality on your creative process?		
Characteristics	Number of people	%
Very positive	15	40,5%
Call sign.	17	45,9%
Neutral	4	10,8%
Negative	1	2,7%

*Source: compiled by the authors*

Thus, according to the data, the majority of students (approximately 86.4%) still consider the impact of virtual reality on the creative process to be positive or very positive. Also, most students believe that the use of virtual reality improves their conceptual design skills. It is important to note that only one person expressed negative feedback about the impact on the creative process (see Table 2).

**Table 2.** Assessment of the Impact of Virtual Reality on Creativity

Assessing the impact of virtual reality on the creative process		
Assessment.	Number of people	%
Positive feedback	33 people	89.2%
Negative	0 people	0%
Undecided or not sure	4 persons	10,8%

*Source: compiled by the authors*

Therefore, virtual reality allows for immersive learning, where students can interact with real-life scenarios and solve problems that reflect the real challenges of their future professional lives. This approach helps to improve creativity, critical thinking, and the ability to work in innovative areas of art and design. In addition, the art landscape is becoming more creative thanks to the integration of VR, and it is important to recognise the limitless imaginations of artists and designers. The convergence of real postmodern processes, such as craft, cultural appropriation, and the actualisation of art, with active interaction with AI, creates both exciting creative possibilities. Neural networks such as Leonardo and Midjourney contribute to the creation of images depicting different environments, the wearer of the garment, and the garment itself.

#### 4. Discussion

This study confirmed the effectiveness of using virtual reality technologies in modern art education. The study also found that one of the notable advantages of introducing VR into the educational process is the increased level of student engagement with the innovative learning environment itself. These views are presented in study by Lahoda et al. (2023). In particular, it has been shown that the immersive nature of VR improves visibility and accessibility, allowing students to explore art in an electronic space. Thus, this virtualisation of learning goes beyond traditional methods, providing students with a platform to simulate and explore different influences on their projects (Muzyka et al., 2021). These theses are confirmed in a number of modern works (Caires et al., 2023; Demssie et al., 2020; Afanasieva, 2023; Metu et al., 2024; Kozlovskiy et al., 2024). Modern experts have described a number of advantages of using virtual reality technologies in the study of art and design.

In particular, according to Bilro et al. (2022), an important advantage of innovative learning is the increase in interactivity. For example, virtual reality makes it possible to create interactive learning environments where students can interact with virtual objects and environments, which contributes to better learning. This opinion is fully confirmed by the results of the study. Another important advantage is the introduction of immersive learning. This means that students can delve into virtual art scenarios where they interact with created objects and environments (Hamurcu et al., 2020). This provides an opportunity to experiment with creating interactive art and design works. Compared to traditional learning, learning art based on virtual technologies also allows for the use of simulations of real-life situations. In particular, VR allows for the creation of simulations of real-life situations that may be difficult or unattainable in real life (Paatela-Nieminen, 2021; Sümer and Vančček, 2022). Students can be assigned to create virtual art projects or designs. This allows them to gain practical experience and solve creative problems in an interactive virtual environment. Modern researchers also highlight other advantages:

**Developing problem-solving skills** - Virtual reality scenarios can include tasks and challenges that require students to think creatively and develop problem-solving skills (Yoo and Brownlee, 2020).

**Increased motivation and engagement** - The use of engaging immersive technologies can make learning more interesting and exciting for students, which can have a positive impact on their motivation and engagement.

**Individualised learning and global access** - BP allows you to create individual learning scenarios that take into account the needs of each student. This facilitates more effective learning and adaptation to different learning styles. At the same time, virtual learning resources can be accessed from anywhere, making learning more flexible and convenient for students (Zhang and Jia, 2021).

**Use of virtual workshops and collaboration** - Industry experts can conduct virtual workshops and lectures and collaborate with students even at a remote distance. This expands the possibilities for sharing experience and knowledge.

**Experimentation with shapes and materials** - Using VR allows students to experiment virtually with different shapes, textures, and materials by creating virtual prototypes of their ideas without actual production.

**Increased technical competence** - The use of VR technologies allows students to learn new tools and applications, which increases their technical competence and adaptability to current trends in the industry (Sofilkanych, 2022).

Although the use of modern technologies has a number of important advantages, contemporary studies have noted that the use of artificial intelligence and virtual reality in art education has certain disadvantages and difficulties. In particular, the lack of creativity is an important challenge. Some studies have noted that in artistic practices, AI may not be emotional and creative enough compared to human creativity, especially in the fields of art and design, where uniqueness and expression are important. According to Rakhimov (2023), an important issue of concern to modern scientists is the question of ethics. For example, the legality of using someone else's ideas from the Internet. AI mainly transforms them into its own searches. This problem is not only in the ethical field, but also in the legal field. And the mechanisms for solving it have not yet been worked out (Lahoda, 2021; Redko et al., 2024). The point is that the use of AI in art creation can raise questions about the ownership and authorship of works, as programs can be based on algorithms and data from other creators (Hutson and Robertson 2023). At the same time, we agree with Ivanenko (2017) that the use of virtual reality and AI can lead to technology dependence. Therefore, the introduction of AI can create a dependence on technology, which can affect traditional methods of learning and the creative process. However, on the other hand, not all students may have a sufficient level of digital communication. Therefore, some difficulties may arise due to technical issues, such as incorrect calibration of equipment, connection problems, or insufficient quality of virtual objects (Shakun, 2022; Androsova, 2023; Pokharel et al., 2024).

In this regard, other researchers emphasise that not all teachers are ready to actively use modern technologies in the teaching process because they do not have a sufficient level of technical or information competence (Bilro et al. 2022). In addition, when implementing virtual reality in education, it is worth paying attention to physical limitations, as the use of VR can cause physical discomfort and fatigue due to prolonged time in an immersive environment, which can limit the duration of use. At the same time, limited social interaction is an important challenge. Virtual environments can limit social interaction between students and teachers, which can affect the collective aspects of learning and community. This aspect is emphasised by many contemporary scholars.

Understanding these challenges allows us to more effectively consider the potential of AI and VR in art education and develop strategies to overcome them. Thus, in response to modern digitalisation changes, it is crucial to find a “balance” between the material and the imaginary. Design educators should incorporate the nuances of interaction with the virtual world into the learning process, emphasising the humanistic and environmental aspects of the design

experience. While fostering creativity, it is equally important to ensure reasonable productivity and responsible use of technology. Therefore, the novelty of integrating virtual reality into design education, combined with the current shortage of experienced teachers in this emerging field, increases the need for careful analysis and discussion. As the situation continues to evolve rapidly, open dialogue is essential to address the challenges, seize the opportunities, and shape the future of design education in the age of virtual reality.

## 5. Final Considerations

Thus, the modern art education system in Ukraine is highly flexible and ready to adapt to technological trends. In particular, it is introducing new digital learning solutions to provide students with the necessary tools for development in the modern information environment.

The results of the study indicate a positive impact of virtual reality on students' creative process and conceptual design skills (86.5% of respondents agreed). The use of virtual reality in art education opens up new opportunities for experimenting with concepts and implementing creative ideas, making learning more interactive and engaging (a significant majority, namely 89.2% of students believe that the use of virtual reality improves their conceptual design skills). Thus, interactive tools allow students to express their ideas creatively in a virtual space. The main advantage is the expansion of creativity and the exploration of new forms of expression through innovative technologies. Virtual reality allows automating and facilitating the creative process, providing new opportunities for artists and designers.

However, along with the positive aspects, the use of artificial intelligence and virtual reality in art education is not without challenges. In particular, there are ethical issues related to the use of these technologies, as well as technical aspects that need to be addressed carefully. Ensuring the ethical use and integration of these technologies with the artistic process becomes an important task to ensure harmony between innovation and traditional artistic creativity. Although virtual reality offers new opportunities for immersive learning and experimentation in art education, physical limitations, technical challenges, and social isolation can limit the full use of this technology.

Therefore, the results of the study emphasise the need for careful consideration and regulation of the use of technology in art education to ensure its maximum benefit for student development and harmonious integration with traditional art.

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### **Acknowledgments**

Not applicable.

### **Authors contributions**

Not applicable.

### **Funding**

Not applicable.

### **Competing interests**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### **Informed consent**

Obtained.

### **Ethics approval**

The Publication Ethics Committee of the Sciedu Press.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

**Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

**Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

**Data sharing statement**

No additional data are available.

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