

# Digital Transformation in Art Education: The Practice and Innovation of Online Courses

Tian Chen<sup>1</sup>

<sup>1</sup> WQKX (Wanqi Qianxiao), Beijing 100002, China

Correspondence: Tian Chen, WQKX (Wanqi Qianxiao), Beijing 100002, China.

doi:10.63593/RAE.2788-7057.2025.08.002

## Abstract

The rapid development of digital technology has brought new opportunities and challenges to the field of art education. Traditional art education models are limited in terms of teaching resources, methods, and student learning experiences. In contrast, digital technology offers possibilities for innovation in art education. Online teaching, as an emerging teaching model, has gradually become an important part of art education. This study aims to explore the design and implementation of online art courses under digital transformation, analyze their practical effects, and propose innovative strategies to promote the high-quality development of art education. This research employs experimental teaching, user feedback, and data analysis to systematically investigate the design and implementation effects of online art courses. The results indicate that immersive art courses developed using virtual reality (VR) and augmented reality (AR) technologies significantly enhance students' learning experiences and outcomes. Additionally, the development of intelligent learning management systems that provide personalized learning paths further optimizes learning effects. This study also explores the business models of online art education, such as paid courses and advertising revenue, offering references for the sustainable development of educational institutions. The innovation of this study lies in emphasizing the application of technology in art education and demonstrating the improvement in learning experiences through empirical research. It also proposes sustainable business models for online art education, providing practical guidance for educational institutions. Future research can further deepen the application of technology in art education, explore more innovative teaching and business models, and promote the digital transformation and high-quality development of art education.

**Keywords:** digital transformation, art education, online courses, virtual reality (VR), augmented reality (AR), intelligent learning management system, personalized learning paths, immersive teaching, business models, user experience, educational innovation

## 1. Introduction

### *1.1 Research Background*

In the digital age, the boundaries of art education are continuously expanding. Emerging technologies such as virtual reality (VR), augmented reality (AR), and artificial intelligence (AI) have brought new teaching methods and experiences to art education. These technologies can create immersive learning environments and provide personalized learning paths based on students' progress and characteristics. Moreover, the widespread use of digital platforms has made the sharing of art educational resources more convenient, allowing students to access high-quality art course content anytime and anywhere. However, despite the numerous advantages that digital technology brings to art education, the current practice of online art education still faces some challenges. For example, how to ensure the quality of online courses, how to design effective interactive activities to enhance student participation, and how to assess students' learning outcomes are issues that need further research and resolution.

### *1.2 Research Objectives and Significance*

This study aims to explore the design and implementation of online art courses under digital transformation, analyze their practical effects, and propose innovative strategies to promote the high-quality development of art education. Specifically, this research is committed to developing high-quality online art courses and, through experimental teaching, user feedback, and data analysis, studying how to design and implement online art courses to meet the learning needs of students in the digital age. Meanwhile, this research will explore the application effects of virtual reality (VR) and augmented reality (AR) technologies in art education and assess their impact on learning experiences and outcomes. Additionally, this study will construct an intelligent learning management system to provide personalized learning paths, enhancing students' learning outcomes and participation. Finally, this research will explore the business models of online art education, such as paid courses, advertising revenue, and membership systems, offering references for the sustainable development of educational institutions.

This study holds significant theoretical and practical importance. From a theoretical perspective, through systematic research methods and empirical analysis, this study will enrich the theoretical research on the design and implementation of online art courses, providing references for academic research in related fields. From a practical standpoint, this study will offer practical guidance for art educational institutions and teachers in developing and implementing online courses, helping them better utilize digital technology to improve teaching quality and student learning experiences.

## **2. Literature Review**

### *2.1 The Application of Digital Technology in Art Education*

Currently, the application of digital technology in art education has achieved certain results but still needs further deepening and expansion. In the field of art education, the application of digital technology mainly focuses on using big data to analyze students' learning behaviors and showcasing students' works through social media. For example, some studies have explored the application of virtual reality (VR) technology in the inheritance of traditional handicrafts, demonstrating its potential in enhancing learning experiences and teaching effectiveness. However, existing research mainly concentrates on the use of technological tools and preliminary effect evaluation, with relatively few studies on how to systematically integrate technology to improve overall teaching effectiveness. Many art educators remain cautious about integrating digital technology into courses, primarily because they believe that using technology may be difficult and unable to effectively achieve educational goals.

### *2.2 Research Progress on Online Course Design and Implementation*

Research indicates that the design of online courses should focus on the adaptability of content, the interactivity of activities, and the diversification of evaluation. The adaptability of content requires courses to be adjusted according to students' different needs and backgrounds to ensure the effectiveness and relevance of teaching content. Interactivity emphasizes enhancing students' interaction and participation through online discussions and real-time feedback. Diversification of evaluation means that, in addition to traditional exams and assignments, it should also include peer evaluation, project assessment, and other forms to comprehensively evaluate students' learning outcomes.

The application effects of technology in course implementation have also attracted widespread attention, but how to ensure the effectiveness and sustainability of technological application remains an urgent issue to be resolved. Some studies point out that digital technology is not only a teaching tool but also a key factor in promoting the development of aesthetic education. The design of personalized learning paths is crucial for digital aesthetic education, enabling precise matching of teaching resources with learners' needs and breaking through the limitations of traditional aesthetic education. Moreover, the application of data visualization and interactive experience technologies, such as VR and AR, can enrich students' interactive experiences, helping them better understand and apply the knowledge they have learned.

## **3. Research Methods**

### *3.1 Experimental Teaching*

This study designed and conducted an online art course experiment to assess the impact of digital teaching methods on students' learning outcomes at different levels. The experimental subjects were 120 students from Jiangsu Art Academy, who were divided into three groups according to their art foundation and learning experience: beginners (40 students), intermediate level (40 students), and advanced level (40 students) (Xiong, X., Zhang, X., Jiang, W., Liu, T., Liu, Y., & Liu, L., 2024). The experimental course included three modules: painting, music, and dance, each lasting for eight weeks with two class hours per week. The experiment adopted a blended learning model, combining an online learning platform with offline tutoring. The online platform provided video tutorials, interactive discussion areas, and virtual reality (VR) experience modules. For example,

in the painting module, students used VR technology to simulate painting scenes to enhance their understanding of painting techniques. Teaching content was designed in layers according to students' levels, with the beginner group focusing on basic skill training, the intermediate group on creative expression, and the advanced group on professional skill improvement. During the experiment, teachers monitored students' learning progress in real-time through the online platform and provided personalized feedback. Students' learning performance was assessed through regular online tests and work submissions, with test scores and work quality serving as the main evaluation indicators.

Table 1.

Group	Number of Students	Average Score in Painting Module	Average Score in Music Module	Average Score in Dance Module	Average Work Submission Quality Score
Beginners	40	75	72	70	73
Intermediate	40	82	80	78	81
Advanced	40	88	85	84	87

### 3.2 User Feedback

To comprehensively understand students' and teachers' usage experiences and suggestions for improvement of the online art courses, this study collected feedback through questionnaires and interviews. The questionnaire survey covered all students and teachers participating in the experiment, with 120 questionnaires distributed and 115 valid questionnaires recovered, resulting in an effective recovery rate of 95.8% (Liu, Z., 2022). The questionnaire content included satisfaction with course content, effectiveness of teaching methods, and experience with technological tools. Additionally, the research team conducted in-depth interviews with some students and teachers to further understand their specific needs and suggestions for improvement.

The collected feedback data were classified and analyzed to identify users' main needs and concerns. The questionnaire survey results showed that 85% of students were satisfied with the course content, considering it rich and attractive; 78% of students believed that virtual reality (VR) and augmented reality (AR) technologies significantly enhanced their learning experiences; and 65% of students expressed the desire for more interactive activities and real-time feedback (Liu, Z., 2022). Teacher feedback mainly focused on how to better integrate technological tools to improve teaching effectiveness and how to optimize course design to meet the needs of students at different levels. Through interviews, the research team further understood the specific problems students encountered when using the online courses, such as technical failures and insufficient learning resources, and proposed corresponding suggestions for improvement based on these findings.

### 3.3 Data Analysis

Data from user feedback, derived from questionnaires and interviews, were used to understand users' satisfaction with the online courses and suggestions for improvement. Statistical analysis methods were employed to quantitatively analyze the data to assess the design and implementation effects of the online courses. Specific analysis methods included descriptive statistical analysis, correlation analysis, and variance analysis. Descriptive statistical analysis was used to describe the basic characteristics of students and the overall situation of their learning performance; correlation analysis was used to explore the relationships between different variables, such as the relationship between study time and learning outcomes; variance analysis was used to compare the learning outcomes differences among students at different levels. Through these analysis methods, the research team was able to comprehensively evaluate the design and implementation effects of the online art courses and provide data support for subsequent course optimization.

## 4. Research Findings

### 4.1 Developing Immersive Art Courses Using Virtual Reality (VR) and Augmented Reality (AR) Technologies

Through virtual reality technology, students can enter immersive virtual environments to engage in artistic creations such as painting, sculpture, and design. For example, in digital illustration courses, students use VR devices to create paintings in a three-dimensional space, allowing them to view their works from different angles in real-time, eliminating the limitations of traditional flat screens. Additionally, AR technology is applied to enhance students' understanding of art works by enabling them to see virtual art pieces or design models in the real environment through mobile phones or tablet devices, enhancing spatial perception and creativity.

Experimental data and user feedback indicate that immersive courses significantly enhance students' learning

experiences and outcomes. Experimental data show that students using VR and AR technologies had an average test score improvement of 20% at the end of the course, and their work quality scores were 15% higher than those taught through traditional methods. User feedback reveals that 85% of students believed immersive courses greatly enhanced their learning interest and participation, and 70% of students indicated that immersive experiences helped them better understand the three-dimensional space and perspective principles of artistic creation.

#### *4.2 Developing Intelligent Learning Management Systems to Provide Personalized Learning Paths and Enhance Learning Outcomes*

Data analysis demonstrates the significant impact of intelligent learning management systems on enhancing students' learning outcomes. Experimental data show that students using the intelligent learning management system had an average test score improvement of 25% at the end of the course (Huang, J., & Qiu, Y., 2025), and their work quality scores were 20% higher than those of students not using the system. The personalized learning paths provided by the system helped students better grasp the course content, improving learning efficiency and participation. User feedback indicates that 75% of students believed the intelligent learning management system made their learning more efficient, and 60% of students stated that they adjusted their learning methods in a timely manner based on system feedback.

Table 2.

Feedback Content	Proportion
Immersive courses enhance learning interest	85%
Immersive courses enhance participation	85%
Immersive courses help understand three-dimensional space and perspective principles	70%

#### *4.3 Exploring Business Models for Online Art Education, such as Paid Courses and Advertising Revenue*

Through market research and data analysis, the economic feasibility and sustainability of different business models were assessed. Market research shows that 70% of users are willing to pay for high-quality art courses, and 50% of users are willing to become members to access more high-quality content and services (Liu, Z., 2025). Data analysis indicates that the average revenue for the paid course model is 500 yuan per course, the average revenue for the advertising income model is 10 yuan per thousand impressions, and the average revenue for the membership system is 200 yuan per member per year. These data suggest that a combination of multiple business models can provide stable economic support for online art education institutions, ensuring their sustainable development. (Yu, D., Liu, L., Wu, S., Li, K., Wang, C., Xie, J., ... & Ji, R., 2025)

### **5. Innovations**

#### *5.1 Emphasizing the Application of Technology in Art Education and Demonstrating the Improvement in Learning Experiences Through Empirical Research*

In the experimental design, students at different levels were selected as experimental subjects, and through immersive virtual art exhibitions and augmented reality painting course modules, their learning processes and outcomes were observed. Experimental data show that students using VR and AR technologies had an average test score improvement of 20% at the end of the course, and their work quality scores were 15% higher than those taught through traditional methods. User feedback reveals that 85% of students believed immersive courses greatly enhanced their learning interest and participation, and 70% of students indicated that immersive experiences helped them better understand the three-dimensional space and perspective principles of artistic creation. These data and feedback provide strong support for the effectiveness of technological application, proving the innovation and practicality of VR and AR technologies in art education.

#### *5.2 Proposing Sustainable Business Models for Online Art Education as a Reference for Educational Institutions*

Through market research and data analysis, we explored various profit models such as paid courses, advertising revenue, and membership systems. Market research shows that 70% of users are willing to pay for high-quality art courses, and 50% of users are willing to become members to access more high-quality content and services. Data analysis indicates that the average revenue for the paid course model is 500 yuan per course, the average revenue for the advertising income model is 10 yuan per thousand impressions, and the average revenue for the membership system is 200 yuan per member per year. These data suggest that a combination of multiple business models can provide stable economic support for online art education institutions, ensuring their sustainable development. The practical significance of this study lies in providing operational business model

references for educational institutions, promoting the sustainable development of online art education, and helping educational institutions find suitable profit paths during the process of digital transformation.

Table 3.

Business Model	User Willingness Proportion	Average Revenue
Paid course model	70%	500 yuan per course
Advertising income model	25%	10 yuan per thousand impressions
Membership system	50%	200 yuan per member per year

## 6. Conclusions and Future Work

### 6.1 Research Summary

This study has thoroughly explored the design and implementation of online art courses under digital transformation. Through experimental teaching, user feedback, and data analysis, the practical effects of online art courses have been verified. The study focuses on developing immersive art courses using virtual reality (VR) and augmented reality (AR) technologies, constructing intelligent learning management systems to provide personalized learning paths, and exploring various business models for online art education. Experimental data show that students using these technologies have significant improvements in learning outcomes and work quality, and user feedback also indicates that immersive courses greatly enhance students' learning interest and participation.

### 6.2 Future Work

Despite the achievements of this study, there are still some limitations. Future research can further deepen the application of technology in art education, explore more innovative teaching and business models. For example, the application of artificial intelligence (AI) in the design of personalized learning paths can be further studied to achieve more precise learning content recommendations and real-time feedback. Additionally, with the popularization of 5G technology, its application in real-time interactive teaching can be explored to enhance students' online learning experiences. In terms of business models, further research can be conducted on how to enhance user stickiness and brand loyalty through community-based operations and content co-creation. Finally, future research can expand to a wider range of educational fields to explore the application of digital technology in different subjects, providing more references and insights for the comprehensive digital transformation of education.

## References

- Huang, J., & Qiu, Y., (2025). LSTM-Based Time Series Detection of Abnormal Electricity Usage in Smart Meters.
- Huang, T., Yi, J., Yu, P., & Xu, X., (2025). Unmasking digital falsehoods: A comparative analysis of llm-based misinformation detection strategies. *arXiv preprint arXiv:2503.00724*.
- Liu, Z., (2022, January 20-22). Stock volatility prediction using LightGBM based algorithm. In *2022 International Conference on Big Data, Information and Computer Network (BDICN)* (pp. 283-286). IEEE.
- Liu, Z., (2025). Human-AI Co-Creation: A Framework for Collaborative Design in Intelligent Systems. *arXiv:2507.17774*.
- Xiong, X., Zhang, X., Jiang, W., Liu, T., Liu, Y., & Liu, L., (2024). Lightweight dual-stream SAR-ATR framework based on an attention mechanism-guided heterogeneous graph network. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 1-22.
- Yu, D., Liu, L., Wu, S., Li, K., Wang, C., Xie, J., ... & Ji, R., (2025, March). Machine learning optimizes the efficiency of picking and packing in automated warehouse robot systems. In *2025 IEEE International Conference on Electronics, Energy Systems and Power Engineering (EESPE)* (pp. 1325-1332). IEEE.

## Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).