

Application of Virtual Reality and 3D Modeling in Art Education: Changing the Aesthetic Experience in the Context of the Digital Revolution

Abstract. With the rapid development of digital technology, virtual reality (VR) and three-dimensional modeling (3D) technologies have gradually become important tools in the field of art education. Against the backdrop of the digital revolution, this paper explores the application of VR and 3D technologies in art education and their impact on students' aesthetic experiences. By analyzing relevant literature and practical cases, this paper summarizes the advantages and challenges of VR and 3D technologies in art education and proposes future development directions. Research shows that VR and 3D technologies can significantly enhance students' aesthetic perception and creativity, but they also face challenges such as high technical costs and insufficient teacher adaptability. This paper aims to provide theoretical support and practical references for the digital transformation of art education.

Keywords: virtual reality, 3D modeling, art education, aesthetic experience, digital revolution, educational technology.

The digital revolution is profoundly transforming various fields of human society, and education is no exception. In art education, traditional teaching models often rely on static visual materials and limited practical opportunities, making it difficult to

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meet students' needs for diverse learning experiences. In recent years, the rise of virtual reality (VR) and three-dimensional modeling (3D) technologies has provided new possibilities for art education. These technologies not only simulate real-world artistic environments but also enhance students' aesthetic experiences through interactivity and immersion.

This paper, against the backdrop of the digital revolution, explores the application of VR and 3D technologies in art education, analyzes their impact on aesthetic experiences, and summarizes the advantages and challenges in current practices. Through literature analysis and case studies, this paper aims to provide theoretical support and practical references for the digital transformation of art education.

The core of the digital revolution lies in the popularization and application of information technology, whose influence has permeated all aspects of education. In art education, the application of digital technology has not only changed teaching methods but also redefined students' aesthetic experiences. Traditional art education primarily relies on teacher instruction and student imitation, while digital technology provides students with more opportunities for independent exploration and creation.

the application of digital technology can significantly enhance students' creativity and aesthetic perception [1]. For example, through VR technology, students can "enter" virtual art spaces, interact with artworks, and gain a deeper understanding of their meaning. Additionally, 3D modeling technology allows students to observe and create artworks from multiple perspectives, breaking the spatial limitations of traditional teaching.

VR technology creates immersive virtual environments, providing students with a learning experience. In art education, VR technology can be used to simulate art exhibitions, historical scenes, and creative spaces. For instance, students can use VR devices to "visit" world-renowned art galleries, appreciate classic artworks, and even interact with virtual artists.

The immersive and interactive nature of VR technology can significantly enhance students' aesthetic experiences [2]. Through VR, students can not only observe artworks but also participate in the

artistic creation process, thereby gaining a deeper understanding of the essence of art.

3D modeling technology creates three-dimensional digital models, offering students more creative possibilities. In art education, 3D modeling technology can be applied to sculpture, architectural design, and animation. For example, students can use 3D modeling software to design virtual sculptures and display and modify them in virtual environments.

Research shows that 3D modeling technology can significantly enhance students' spatial imagination and creativity [3]. By using 3D modeling, students can observe and modify their works from multiple angles, thereby better mastering artistic techniques.

Advantages of VR and 3D Technologies in Art Education:

- *Enhanced Learning Interest*: The immersive and interactive learning experiences provided by VR and 3D technologies can significantly increase students' interest and engagement;
- *Expanded Learning Resources*: Through VR technology, students can access art resources from around the world, breaking geographical limitations in traditional teaching;
- *Fostering Creativity*: 3D modeling technology offers students more creative possibilities, helping to cultivate their creativity and spatial imagination.

Challenges of VR and 3D Technologies in Art Education:

- *High Technical Costs*: The high cost of VR devices and 3D modeling software makes it difficult for many educational institutions to afford them.
- *Insufficient Teacher Adaptability*: Many teachers lack experience in using VR and 3D technologies and require relevant training.
- *Over-Reliance on Technology*: Excessive dependence on technology may lead students to neglect the learning of traditional artistic skills.

Future Development Directions:

1. *Technology Popularization and Cost Reduction*. With continuous technological advancements, the cost of VR devices and 3D modeling software is expected to gradually decrease, enabling their wider application in art education.

2. Teacher Training and Curriculum Design. Educational institutions should strengthen teacher training to help them master the use of VR and 3D technologies. At the same time, art education curricula should be designed to leverage the advantages of digital technologies.

3. Integration of Technology and Tradition. While applying digital technologies, it is important to balance them with traditional artistic skills to avoid over-reliance on technology.

Case Studies:

1. Application of Virtual Reality in Art History Teaching. In an art history course at a university, teachers used VR technology to create a virtual Renaissance art exhibition. Students could “walk into” the exhibition using VR devices, closely observing works by masters such as Leonardo da Vinci and Michelangelo. This immersive learning experience not only increased students’ interest but also helped them gain a deeper understanding of Renaissance art styles and historical contexts.

2. Application of 3D Modeling in Sculpture Teaching. In a sculpture course at an art college, teachers introduced 3D modeling technology. Students first designed virtual sculptures using 3D modeling software and then materialized their works through 3D printing. This teaching method not only enhanced students’ spatial imagination but also allowed them to iterate and modify their works more quickly, thereby improving creative efficiency.

Thus, virtual reality and 3D modeling technologies provide new possibilities for art education, significantly enhancing students’ aesthetic experiences and creativity. However, the application of these technologies also faces challenges such as high technical costs and insufficient teacher adaptability. In the future, with continuous technological advancements and innovations in educational models, VR and 3D technologies are expected to play an even greater role in art education.

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Применение виртуальной реальности и 3D-моделирования в художественном образовании: изменение эстетического опыта в контексте цифровой революции

Аннотация. В стремительном потоке цифровой революции технологии виртуальной реальности (VR) и трехмерного моделирования (3D) постепенно обретают статус незаменимых инструментов в современном художественном образовании. Кроме применения VR- и 3D-технологий в художественном образовании, в статье рассматривается и их влияние на эстетический опыт студентов. Опираясь на анализ академической литературы и опыт практического применения этих инструментов, автор обобщает преимущества и проблемы, возникающие при их интеграции в художественном образовании, а также намечает перспективные пути для их дальнейшего развития и обогащения образовательного процесса. Исследования показывают, что VR- и 3D-технологии могут значительно улучшить эстетическое восприятие и творческие способности учащихся, но при этом возникают такие проблемы, как высокая техническая стоимость и недостаточная готовность педагогов к освоению этих инновационных инстру-

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ментов. Цель данной работы – оказать теоретическую поддержку и дать конкретные рекомендации для цифровой трансформации художественного образования.

Ключевые слова: виртуальная реальность, трехмерное моделирование, художественное образование, эстетический опыт, цифровая революция, образовательные технологии.