Exploring Innovative Interaction and Cultural Transmission of Huai Opera in the New Era through VR Technology

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Abstract: *As one of the representatives of traditional Chinese opera, Huai Opera is an important intangible cultural heritage of the Yancheng area, whose cultural value and artistic charm face challenges in inheritance and development in the new era. The rapid development of virtual reality technology provides new possibilities for the innovative interaction and cultural transmission of Huai Opera. This paper aims to explore the strategies for the innovative interaction and transmission of Huai Opera culture in the new era based on VR technology. Through methods such as literature review, it is found that VR technology can not only effectively enhance the immersive experience of Huai Opera but also provide new paths for the global dissemination and cultural protection of Huai Opera.*

Keywords: *Huai Opera, New Era, Virtual Reality, Innovative Interaction, Cultural Transmission*

1. Introduction

Local opera is an important part of traditional Chinese culture. As one of the traditional Chinese operas, Huai Opera originated in the Huai'an region during the Qianlong period of the Qing Dynasty and has a history spanning several centuries. It boasts rich cultural connotations and is a gem of Chinese opera. However, with the advancement of modernization, the inheritance and development of Huai Opera face unprecedented challenges, such as a sharp decline in the number of young audiences, a sluggish local opera market, outdated themes in opera creation, and bottlenecks in the creation and transmission of opera[1]. Against this backdrop, how to effectively utilize modern technological means, such as virtual reality (VR) technology, to innovate the interaction methods of Huai Opera culture has become an urgent issue to address. This paper aims to explore how to use VR technology to innovate the interaction methods of Huai Opera culture, enhancing its transmission effect in the context of the new era. By delving into the historical origins, development, and artistic characteristics of Huai Opera, this study aims to highlight its cultural value as intangible cultural heritage. By analyzing the current challenges faced by Huai Opera, the paper proposes new ways to integrate VR technology with Huai Opera, deeply blending traditional culture with modern technology, ultimately improving the transmission effect of Huai Opera and expanding its cultural influence and recognition.

2. Origin and Flow of Huai Opera: Historical Inheritance and Cultural Value

2.1 Historical Origins of Huai Opera

Huai Opera, also known as "Jianghuai Opera" and "Jiangbei Small Opera," is an important genre of traditional Chinese opera. Its origins can be traced back to the Qianlong period of the Qing Dynasty, around the mid-18th century. The Huai'an area was economically prosperous and culturally vibrant, becoming an important region for the convergence and development of various opera arts. At that time, a form of folk art called "door lamenting words," which evolved from farmers' calls and field songs such as "rang rang tune" and "planting seedlings tune," was popular. This form, performed by one or two people, later combined with the "incense fire opera" for temple celebrations in northern Jiangsu, forming what was called "Jiangbei Small Opera." Influenced by Anhui Opera and Beijing Opera, Huai Opera gradually enriched its singing, performance, and repertoire, forming its unique characteristics. In June 2008, Huai Opera, declared by the Shanghai Huai Opera Troupe and Yancheng City, Jiangsu Province, was approved by the State Council to be included in the second batch of national intangible

cultural heritage.

2.2 Major Schools and Representative Works

The major schools and representative works of Huai Opera are an important part of Huai Opera art, shining gems in the treasure trove of Huai Opera. These schools, each with its unique characteristics, have developed together, showcasing the charm of Huai Opera through different artistic expressions and repertoires. The main schools of Huai Opera include "Xiao School Dan Tune," "Li School Dan Tune," "Ma School Free Tune," "Xu School Old Dan," "Zhou School Sheng Tune," "Yang School Sheng Tune," and "Li School Sheng Tune." These schools were formed and developed by Huai Opera artists such as Xiao Wenyan, He Jiaotian, Li Yuhua, Ma Lintong, Xu Guifang, Zhou Xiaofang, Yang ZhanKui, and Li Shaolin during their long-term artistic practice. The representative works of Huai Opera are diverse, including ancient costume dramas with a long history, such as "The Generals of the Yang Family" and "Yue Fei," which display rich historical and cultural heritage. There are also modern plays close to life, such as "Lighting Reduction Unwavering" and "Fisherman by the River," which reflect social reality and the brilliance of human nature through delicate emotional portrayals and profound themes.

2.3 Singing, Music, Dance, and Costumes

The singing and music of Huai Opera belong to the plate-and-tune style, centered on three main tunes: Pulling Tune, Huai Tune, and Free Tune. Pulling Tune is gentle and detailed, with clear lines, suitable for lyrical scenes. Huai Tune is high-pitched and intense, mainly used for narration. Free Tune has a smooth melody and is highly adaptable. In addition to the three main tunes, there are dozens of tunes derived from them, such as "Leaf Tune," "Cross Tune," "Nanchang Tune," "Lower River Tune," "Huai Sad Tune," "Great Sad Tune," and "Little Sad Tune." These tunes are characterized by their emotional richness, from lyrical to tragic, enhancing the unique charm and flavor of Huai Opera.

The musical accompaniment of Huai Opera is mainly orchestral, including instruments such as the erhu, sanxian, yangqin, flute, and suona. Traditional percussion instruments like the flat drum, Su gong, cymbals, and tang drum are also retained. These instruments coordinate with each other during performances, forming the unique musical style of Huai Opera, which is melodious and rhythmic, enhancing the plot and characters' emotions.

In Huai Opera, dance is not only used to portray daily life scenes, such as walking, sitting, and working, but is also often employed to express the emotional states of the characters, such as joy, sorrow, anger, and worry. Through the rhythm and pace of dance, actors vividly convey the characters' inner world, helping the audience better understand the plot while enjoying the dance.

The costumes of Huai Opera are an essential part of stage art, with various types, including robes, official clothes, gowns, cloaks, and armor. These costumes have strict requirements and regulations on color, patterns, and texture. For example, the robes worn by emperors and generals are brightly colored and intricately patterned, while official clothes are simpler. Gowns worn by ordinary people are plain in style and color.

2.4 The Role of Huai Opera in Local Culture

Huai Opera occupies a significant position in local culture, especially in Jiangsu, where it enjoys a broad base of popularity and social influence, deeply loved by the masses. Originating from the incense fire opera in northern Jiangsu, Huai Opera has a history of over 200 years, showcasing the customs and cultural characteristics of northern Jiangsu through its unique singing, music, and dance styles. It represents regional culture, preserves traditional culture, reflects people's lives, serves social functions, and promotes cultural tourism.

2.5 Significance of Huai Opera as Intangible Cultural Heritage

The significance of Huai Opera as intangible cultural heritage lies in its cultural transmission and historical witness, artistic value and aesthetic experience, social function, and contemporary relevance[2]. As a gem of intangible cultural heritage, Huai Opera carries the rich historical and cultural heritage of northern Jiangsu, witnessing the changes and development of regional culture. Its unique artistic value offers a visual and auditory feast for people, playing an essential role in educating the

public and enriching spiritual life. It serves as a cultural symbol, fostering cultural exchange and cooperation.

3. Challenges and Breakthroughs in the Inheritance of Huai Opera: Analysis of the Current Situation and Response Strategies

3.1 Current Issues in the Cultural Transmission of Huai Opera

3.1.1 Sharp Decline in Audience Numbers

With societal development and cultural diversification, young people's interest in opera is not as strong as that of the older generation, leading to a gradual decrease in the opera audience. Additionally, opera faces fierce competition from other forms of entertainment, such as pop music and variety shows, which attract many young audiences, further compressing the survival space of opera[3].

3.1.2 Sluggish Local Opera Market

Due to the decreasing number of audiences, the performance ecosystem of local operas has been severely impacted, significantly reducing performance opportunities and leaving many troupes with no shows to perform. The sluggish performance market has put tremendous economic pressure on opera practitioners, making it difficult to sustain livelihoods, leading to a talent gap in opera, which further weakens its influence and transmission momentum.

3.1.3 Outdated Themes in Opera Creation

Outdated themes in opera creation are a significant challenge for local opera. While traditional operas have their unique charm and deep cultural heritage, the rapidly changing social environment means audiences' aesthetic needs and interests are continually evolving. Many local operas fail to keep pace with these changes, resulting in outdated themes that lack novelty and fail to attract modern audiences.

3.1.4 Bottlenecks in Opera Creation and Transmission

The limited extent of opera education and the insufficient resources in specialized art schools hinder talent cultivation in opera. Traditionally, opera is transmitted from masters to apprentices through long-term learning and practice. However, the fast pace and economic pressures of modern society make it difficult for the younger generation to dedicate enough time and effort to learning opera, leading to a break in the transmission chain.

4. Virtual Reality Technology: Technological Innovation in the New Era

4.1 Basic Concepts and Development of VR Technology

4.1.1 Definition of Virtual Reality

Virtual Reality (VR) is a computer simulation system that creates and experiences virtual worlds. Its core lies in using computer technology to generate a highly simulated or even super-realistic three-dimensional environment. This environment integrates various information sources, including visual, auditory, and even tactile sensory information, allowing users to immerse themselves in this virtual world through interactive means.

4.1.2 Current Status of VR Technology

VR technology is currently in a rapid development phase, with the market scale continuously growing. The industry chain covers hardware, software, content creation and distribution, as well as downstream applications and services. The competitive landscape is dominated by leading domestic VR manufacturers, with technological trends showing characteristics of intelligence, immersion, and deep integration with AI, AR, and other frontier technologies. In the future, as technology continues to mature and application scenarios expand, VR technology is expected to achieve widespread application in entertainment, education, healthcare, and other fields, bringing profound impacts.

4.2 Characteristics and Advantages of VR Technology

The primary characteristic of VR technology is its high degree of immersion. Through precise

graphics rendering, realistic sound simulation, and possibly multi-sensory feedback such as touch and smell, users can find themselves in a completely user-controlled virtual world. Simultaneously, VR technology also possesses strong interactivity, breaking the traditional one-way communication mode of media, allowing users to directly interact with objects, characters, and even the entire scene within the virtual environment.

4.3 Development Trends of VR Technology

In recent years, virtual reality technology has made significant progress. In terms of software and platforms, the enhancement of development tools and cross-platform compatibility has made VR content development and usage more efficient. In the cultural field, the application of virtual reality technology has brought innovations in virtual museums, immersive cultural experiences, and educational training. Online museums and virtual exhibitions allow users to visit museums and art exhibitions around the world from any location, recreating and preserving historical sites and artifacts. In the entertainment field, virtual reality technology has promoted the development of immersive experiences, virtual concerts, and interactive films. VR games offer highly immersive interactive experiences, allowing players to explore and adventure in virtual environments. Additionally, virtual social platforms such as VRChat and Facebook Horizon enable users to socialize in virtual environments, increasing the diversity of entertainment.

5. Integration of Virtual Reality and Huai Opera: New Paths for Innovative Interaction and Cultural Transmission

5.1 Application Scenarios of VR Technology in Huai Opera

5.1.1 VR Huai Opera Museum

Using VR panoramic shooting and three-dimensional scene production technology, the exhibits and scenes of the offline Huai Opera Museum are digitized and moved online to form a VR Huai Opera Museum. Viewers can freely roam through various exhibition halls via VR equipment, closely observe Huai Opera costumes and props, and interact with exhibits in the virtual environment to gain an in-depth understanding of all aspects of Huai Opera culture.

5.1.2 VR Huai Opera Performance Experience

Select classic Huai Opera repertoires for digital processing and construct virtual scenes of the performances through VR technology. Viewers can immerse themselves in the performances by wearing VR equipment. During the performance, interactive segments can be designed, allowing viewers to influence the story's direction by choosing different plot branches or participating in character performances. This immersive interactive participation method helps viewers gain a deeper understanding of the plot and characters.

5.1.3 Developing Engaging Huai Opera Games

By combining virtual reality (VR) technology, an immersive Huai Opera cultural game can be designed, allowing users to learn about the historical background and character relationships of Huai Opera in the game. Through tasks and challenges in the game, users can gain a deeper understanding of the essence and value of Huai Opera culture[4]. Additionally, engaging interactive games such as puzzle-solving games can be designed. Through continuous innovation, suitable integration points and methods can be found to allow users to gain a deeper understanding and experience of Huai Opera culture.

5.2 Application of VR Technology in Huai Opera Education and Dissemination

VR technology provides a new platform for Huai Opera education. Through immersive and interactive teaching methods, students can learn Huai Opera culture and performance techniques more intuitively and vividly. For example, in a VR environment, students can interact with virtual teachers, who provide demonstrations, explanations, and guidance for Huai Opera performances. Students can ask questions at any time and receive answers. Moreover, using motion capture technology, students' performance movements can be reflected in virtual characters in real-time, allowing instructors to provide feedback and guidance based on students' performances.

5.3 Global Promotion and International Cooperation of VR Huai Opera

Using VR technology for the global promotion of Huai Opera can expand its influence, allowing more international audiences to understand and experience this traditional art. For example, organizing virtual Huai Opera performances and broadcasting them to global audiences through VR platforms allows more people to appreciate the artistic charm and cultural connotations of Huai Opera. Additionally, multi-language versions of VR Huai Opera courses can be developed for global promotion, enabling more international students to learn about and understand Huai Opera.

6. Conclusion and Prospects

This study aims to explore the innovative interaction and transmission of Huai Opera culture in the new era based on VR technology. Firstly, VR technology provides significant opportunities and tools for the inheritance and development of Huai Opera culture. Through VR technology, audiences can experience Huai Opera performances immersively, enhancing their sense of immersion and participation, thereby stimulating their interest and love for Huai Opera. This interactive experience helps attract more young people to engage with Huai Opera culture, promoting the transmission of traditional culture. Secondly, the innovative interactive design of Huai Opera culture based on VR technology holds great potential. Through innovative interactive designs, Huai Opera can be combined with virtual reality, breaking the limitations of time and space, allowing audiences to participate in the storyline and interact with actors. This innovative interactive design not only enhances audience engagement but also injects new vitality and creativity into Huai Opera, driving its modern transformation and innovative development. Moreover, VR technology plays a crucial role in the dissemination of Huai Opera culture. With VR technology, Huai Opera performances can be broadcast globally via the internet, overcoming geographical limitations and enabling more people to understand and appreciate Huai Opera. At the same time, VR technology provides the possibility for the digital preservation and archiving of Huai Opera culture, ensuring its transmission and preservation.

Despite the positive outcomes achieved in the innovative interaction and transmission of Huai Opera culture in the new era based on VR technology, several challenges and areas for improvement remain. Firstly, there is a need to strengthen the integration of VR technology with Huai Opera art. Huai Opera is an art form with a long history and unique performance styles, and how to fully leverage the advantages of VR technology while maintaining its traditional charm requires further research and exploration. Secondly, the popularization and cost issues of VR technology also need to be addressed. Currently, the high cost of VR equipment limits the participation of a broader audience. In the future, it is necessary to further reduce equipment costs and improve usability so that more people can enjoy the Huai Opera cultural experience based on VR technology. Finally, relevant policies and support need to be strengthened. Governments and related institutions can formulate policies that support the application of VR technology in cultural transmission, providing funding and resource support to promote the sustainable development of the innovative interaction and transmission of Huai Opera culture.

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