The Protection and Innovation of Guangdong Cantonese Opera in the Digital Age

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Abstract: This paper takes Guangdong Cantonese opera as the research object and explores the protection and innovation of traditional culture in the digital age. The paper points out that Cantonese opera faces problems such as aging audiences and a single way of inheritance, so it proposes to use digital media technology for protection and innovation. The paper uses case analysis, literature and other methods to explore from three dimensions: digital preservation, performance form innovation and interactive experience design. This paper is divided into three parts. The first part analyzes the development status of Cantonese opera in contemporary society. The second part explains how to apply digital technology to the protection of Cantonese opera. The third part discusses the application of digital technology in Cantonese opera performances and audience experience innovation. This study has certain reference and reference significance for the exploration of the protection of Guangdong Cantonese opera in the digital age. It can make full use of modern technology to achieve protection and innovation in artistic expression and digitalization.

Keywords: digitization; Guangdong Cantonese opera; innovation and protection

1. Introduction

Cantonese opera, also known as opera, was originally evolved from southern opera and its history can be traced back to the middle of the Ming Dynasty. " It began to appear in Guangdong and Guangxi during the Jiajing period of the Ming Dynasty. It is a performing art that combines singing, acting, reciting and beating, music by musicians, stage costumes, abstract shapes and other elements [1]". After hundreds of years of cultural accumulation and evolution, Cantonese opera has continuously absorbed the essence of local music and folk art to shape its unique artistic style. Entering the Qing Dynasty, especially during the Qianlong period, Cantonese opera ushered in a period of rapid development. The script creation became increasingly rich, the performing arts became more mature, and gradually formed a drama system with local characteristics. As time went on, Cantonese opera was not only widely spread in Guangdong Province, but also had a profound impact in Hong Kong, Macau and overseas Chinese communities. The 20th century was the golden age of the development of Cantonese opera. During this period, many Cantonese opera celebrities and classic repertoires appeared, attracting countless audiences. The artistic form and performance style of Cantonese opera were further improved and enhanced at this time, becoming an indispensable part of Chinese traditional opera culture[2].

However, with the development of society and the advancement of science and technology, especially the emergence of new entertainment media such as movies and television, " these rich and diverse cultural and artistic forms are more popular, entertaining, and popular than traditional opera, and are more likely to attract young audiences and meet the psychological needs of the younger generation for novelty and novelty. Therefore, in the current society with rapid development of information technology, traditional opera is facing an unprecedented development dilemma [3]". The audience group is aging and the younger generation is less interested in traditional opera, which is the dilemma facing the development of Cantonese opera. Despite this, the Cantonese opera community has not given up its efforts, but has actively sought ways to combine with modern technology, trying to inject new vitality into this traditional art through digitalization and network communication. At present, although Cantonese opera is no longer a mainstream form of entertainment, it still occupies a place in cultural inheritance and art education. Various Cantonese opera groups and institutions are constantly trying to innovate to adapt to the needs of modern society and give Cantonese opera new vitality.

2. Analysis of the challenges and difficulties faced by Cantonese opera

When discussing the historical evolution and current situation of Guangdong Cantonese opera, we cannot ignore the challenges and difficulties it faces. Cantonese opera, the shining pearl of Lingnan culture, has encountered unprecedented shocks and tests with the changes of the times[4].

The rapid development of information technology has posed a huge challenge to traditional art forms. The rise of online media has changed people's aesthetic habits and consumption patterns. The younger generation tends to pursue fast-paced, highly interactive entertainment methods, which has had a significant impact on the inheritance and development of traditional arts such as Cantonese opera. The aging phenomenon of the audience group is becoming more and more serious, while the ability to attract a new generation of audiences is relatively weak. This generational gap poses a substantial threat to the future of Cantonese opera. In addition, it takes a long period of time to cultivate professional Cantonese opera talents, and the existing education and support system has not been able to fully adapt to this demand, resulting in the inheritance and development of Cantonese opera art being limited[5].

In addition, Cantonese opera also faces difficulties in the process of traditional protection and innovative development. On the one hand, the original traditional performance form is difficult to meet the increasingly diverse cultural needs of contemporary audiences; on the other hand, excessive innovation may cause Cantonese opera to lose its unique artistic charm and cultural connotation. Maintaining a balance between tradition and innovation is a major problem in the development of Cantonese opera[6].

Faced with these challenges and difficulties, how to effectively protect and inherit Cantonese opera culture has become an urgent problem to be solved. Perhaps, through the introduction and application of digital technology, new vitality can be injected into the promotion and development of Cantonese opera. Digital media can not only provide a new display platform for Cantonese opera, but also enhance the interest of young people in Cantonese opera through interactive and innovative experiences, thus alleviating the problem of aging audiences to a certain extent.

3. Application of digital technology in the protection of Cantonese opera art

3.1 Advantages of digital information technology

With the vigorous development of information technology, the boundaries of digital technology are constantly expanding, profoundly changing people's lifestyles and cultural consumption patterns. Especially in the field of cultural inheritance and protection, the application of digital information technology has opened a new era and injected new vitality into traditional art. In front of Guangdong Cantonese opera, an art form with a long history and profound cultural heritage, the intervention of digital information technology not only provides an innovative path, but also opens up a new way of communication and experience[7].

The latest generation of digital information technology is virtual reality (VR) technology. Since it was first proposed in the early 1950s, VR has gone a long process from concept to practice. " Initially, VR technology was mainly used in military, aerospace training and other fields " With the rapid development of computer technology, this technology has gradually entered the civilian market and shined in many fields such as games, education, and medical care. In particular, in recent years, with the continuous improvement of hardware equipment and the continuous upgrading of software experience, VR technology has gradually matured, providing new possibilities for cultural inheritance and protection.

" VR technology refers to the use of computer technologies such as algorithms and modeling to generate a digital environment that is highly similar to the real world in the form of code. In this digital environment, human senses such as vision, hearing and touch can be simulated ". Its advantage is that it uses special equipment such as head-mounted displays, handles or gloves to transmit sensory information such as vision, hearing and touch, making users feel as if they are in the scene. Through real-time rendering and sensor technology, this technology allows users to immerse themselves in a virtual environment and obtain a real viewing and interactive experience. This immersive experience makes users feel as if they are in a real scene and can feel the details and atmosphere of the environment from all directions and angles. For the traditional art form of Cantonese opera, the introduction of VR technology has undoubtedly injected new vitality into its inheritance and development. Through this technology, Cantonese opera audiences can experience this art form in a

new way and feel the charm of Cantonese opera from multiple angles and in all directions. This will not only help attract a new generation of audiences, but also provide new creation and rehearsal tools for Cantonese opera actors and producers.

In addition, digital storage technologies such as cloud storage technology provide massive storage space. Compared with traditional physical storage devices, it is no longer limited by the problem of insufficient storage space. This digital storage method not only greatly facilitates the limitations of scholars and enthusiasts, but also allows for easy expansion of storage space, which means that whether it is scripts, costumes, music or video materials, they can be fully researched, providing the possibility of access anytime and anywhere, and providing powerful tools for art inheritors, enabling them to more conveniently teach and perform Cantonese opera art.

More digital information technologies, such as augmented reality (AR), artificial intelligence (AI), and 3D scanning, have brought new opportunities to the development of Cantonese opera. Facing the challenges and opportunities of the digital age, Cantonese opera art should follow the trend of the times, grasp the pulse of the development of digital information technology, and organically integrate it into the protection and development of Cantonese opera art.

3.2 Methods for digital preservation of Cantonese opera

Cantonese opera form mainly involves two aspects: one is the preservation of information, that is, the digitization of Cantonese opera scripts, scores, music, documentary history and other materials; the other is the preservation of costumes and props, which requires special measures to protect these precious works of art.

The preservation of data can be achieved through database storage technology. We can create an account to classify and locate Cantonese opera data by type and theme, establish a database with a clear structure, easy to retrieve and disseminate, and set permissions for only reading and sharing. Such a database is not only conducive to the long-term preservation of resources, but also convenient for browsing and sharing at any time without being restricted by time and region.

Three-dimensional scanning technology can be used to preserve costumes and props. Given that costumes are usually made of high-end fabrics such as silk and satin, and are supplemented by exquisite decorations such as gold and silver thread embroidery, beads, and gemstones, these materials and accessories are often delicate and not resistant to washing. Therefore, traditional Cantonese opera costumes mainly rely on dry cleaning or manual cleaning to maintain their neatness and color. In this case, 3D scanning technology has shown significant advantages in the preservation and restoration of costumes. In terms of prop preservation, 3D scanning technology also has significant advantages. Props are often made from a variety of materials, including wood, metal, plastic, paper, etc. These materials can age and become damaged over time, especially props that are used frequently[8].

In 2022, a research team from Donghua University opened up a new path for the digital virtual restoration of ancient clothing through advanced 3D clothing modeling technology. Using the Tang Dynasty yellow-faced embroidered robe as a practice, the researchers first used software to identify and repair the damaged patterns on the robe. Then, they used another software to redesign the plane shape and structure of the robe. Finally, they made a 3D model of the robe and simulated the process of stitching with the damaged pattern to achieve a 3D reproduction of the robe [9]. The application of this technology undoubtedly provides a valuable reference for the preservation of Cantonese opera costumes.

Using 3D scanning technology to digitally preserve Cantonese opera costumes can not only more realistically and comprehensively record the details of the costumes, such as style, decoration and fabric, to build 3D models, but also provide a solid scientific basis for the restoration and inheritance of costumes through the collation and analysis of scanning data. Such technical means can effectively reduce the risk of damage to precious costumes, and can also be shared and disseminated through online platforms, so that more people have the opportunity to deeply understand and appreciate the unique charm of Cantonese opera.

In summary, the implementation of digital preservation methods can not only effectively protect the intangible cultural heritage of Cantonese opera, but also provide technical support for its innovative development. Digital means not only help people access and understand Cantonese opera more conveniently, but also allow the charm of this treasure of Chinese traditional culture to be reborn in the new era.

3.3 Application cases of digital technology in cultural and artistic protection

When exploring the application of digital technology in the protection and innovation of Cantonese opera, we should not ignore its successful practices in other cultural and artistic fields around the world. These cases not only provide us with valuable experience, but also reveal the possibility of applying similar methods to Cantonese opera.

In the field of visual arts, " the most typical "Digital Dunhuang" project uses digital humanities technology to virtually reconstruct the historical scenes of the cultural heritage of the Mogao Grottoes in Dunhuang, forming a digital humanities archive, which freezes the Dunhuang art in a specific time and space. Users can roam the Mogao Grottoes in an immersive way through an interactive platform built with digital technologies such as VR/AR and multimedia. This approach not only enriches the content of the archive display, but also allows the cultural heritage to be permanently preserved and sustainably used ". These digital technologies enable ancient murals, sculptures and other works of art to be reproduced in three dimensions. Audiences can immerse themselves in these works of art without geographical restrictions and experience the feeling of being surrounded by historical depth and artistic details. The application of such technologies not only deepens the public's understanding of works of art, but also opens up new ways to protect cultural heritage.

In the field of drama, digital technology has also been used to revive ancient drama forms. The world's first Henan opera "Seventh Rank Sesame Official" shot and produced using VR technology was officially released on September 27, 2023. This work uses computer graphics system technology to perform three-dimensional space synthesis, truly restoring the ancient county government of Jun County 600 years ago, providing the audience with a new immersive experience. The audience can use VR smart glasses to travel through scenes, have "zero distance" contact with the actors, and enjoy an immersive viewing experience. This not only opens up new channels for the spread of drama, but also enables performances to transcend time and space limitations and reach a wider audience.

In short, these cases show that digital technology plays an increasingly important role in the protection and innovation of culture and art. By studying these successful practices, we can gain inspiration and think about how to adapt and apply these technologies to the protection and development of Cantonese opera to ensure that this precious cultural heritage is properly passed on and appreciated by more people.

4. Application of digital technology in artistic innovation of Cantonese opera

4.1 Application of digital technology in Cantonese opera performances

When exploring the intersection of digital technology and artistic innovation in Cantonese opera, one area that stands out is the application of digital technology in Cantonese opera performance. The use of this technology not only reshapes the expression of traditional art, but also brings a new way of performance to Cantonese opera actors.

Applying VR technology to Cantonese opera training has promoted the spatial upgrade of opera performances, creating a virtual stage environment and providing psychological training for actors. This training mode allows actors to face different types of virtual audiences on a stage without real audiences, experience various performance atmospheres, and thus improve their performance on the real stage. By simulating various performance situations, actors can enhance their stage adaptability and psychological quality. VR technology can also simulate various complex stage settings and lighting effects, allowing actors to understand and adapt to these elements more deeply during training. In this way, Cantonese opera actors can continuously practice and optimize their performances in a safe and controllable environment, improving their acting skills and stage experience. At the same time, this training method can also help reduce mistakes in actual performances and reduce performance risks.

This technology is also applicable to the learning of Cantonese opera performances. Among the ten major roles in Cantonese opera, each role has its own unique performance characteristics and skills. Take one role, such as "Ugly Sheng". Ugly Sheng plays a funny role. This role is known for its changing expressions and deformed movements, which brings a lot of challenges to learners. However, with the help of VR technology, the role can be vividly presented in front of the eyes. Learners can conduct virtual close-up learning and observe the performances of professional actors in detail. Whether it is expression or movement, they can be accurately imitated and learned.

In summary, the integration of digital technology has opened a new chapter for Cantonese opera performances, integrating traditional art with modern technology. The application of these technologies not only enriches the artistic expression of the performances, but also indicates that with the continuous advancement of technology in the future, the application of digitalization in the innovation of Cantonese opera art will show broader potential and inject new vitality into traditional culture.

4.2 Application of digital technology in Cantonese opera viewing experience

With the continuous advancement of science and technology, the application of VR technology in various fields has gradually become popular [9]. Cantonese opera art can naturally also achieve innovation with the help of this modern technology. By applying this technology to the viewing experience of Cantonese opera, it can present a novel way of experience to the audience, which may increase people's interest and enthusiasm for Cantonese opera art.

Using VR technology, the audience can experience the charm of Cantonese opera in an immersive way. " Traditional opera is mainly presented through stage performances. VR technology breaks this limitation, allowing audiences to explore freely in virtual space [10]. In this virtual world, audiences can choose different perspectives to watch the performance and even interact with the actors. In the Cantonese opera Golden Lotus, there are segments that allow audiences to participate in the decision-making process of the plot. Through voting or interactive Q&A, the audience can influence the development of the plot to a certain extent. If it is viewed through traditional electronic devices, it is difficult to achieve such interactivity. However, through VR technology, this interactive experience will be greatly enhanced. The audience will no longer just watch passively, but become part of the play, and their choices and decisions will directly affect the direction of the plot. This immersive experience allows the audience to have a deeper understanding of the artistic connotation of Cantonese opera, and also brings them a brand new viewing experience[11].

Virtual reality technology has great potential in innovating the viewing experience of Cantonese opera. By using this technology, we can bring a new immersive viewing experience to the audience. In the future, with the continuous development and improvement of VR technology, we have reason to believe that Cantonese opera art will shine more brilliantly in the digital age.

5. Conclusion

Cantonese opera is a representative of Lingnan culture and a treasure of traditional Chinese opera culture. However, in today's world of developed network information and diversified entertainment methods, Cantonese opera has gradually faded out of the mainstream, but the emergence of digital technology has injected fresh blood into the protection and innovation of Cantonese opera. Some of them are cloud storage and VR virtual reality technology. Cloud storage can digitize and save Cantonese opera materials, such as Cantonese opera scripts, audio and video materials, and even digitally save costumes using 3D scanning technology. VR technology can not only bring digitized Cantonese opera materials into reality, so that the audience is no longer bound by time and space, but also provide a new way for Cantonese opera performances and actor training, integrating the protection and innovation of Cantonese opera. For the protection of Cantonese opera, we can also learn from the experience of the Dunhuang murals that have been successfully digitized, which is a typical case of digital preservation of cultural technology. Future research and practice should continue to explore the combination of digital technology and traditional art, so that Cantonese opera can prosper and develop in the context of the new era.

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