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Cross-Border Integration of Chinese Traditional Opera and Animation under Digital Technology

Jinling Dai [1,*] and Husaini Yaacob [1]

[1] School of Design, City University Malaysia, Kuala Lumpur, Malaysia

[*] Correspondence: Jinling Dai, School of Design, City University Malaysia, Kuala Lumpur, Malaysia

Abstract: The advancement of digital technology has provided unprecedented opportunities for the cross-border integration of traditional Chinese opera and animation, promoting the innovative development and inheritance of traditional culture. However, there is still a lack of systematic research on the specific paths and impacts of this integration. This article aims to explore how digital technology can promote the combination of traditional Chinese opera and animation, in order to enhance the artistic expressiveness and the effectiveness of its dissemination. In this research, the article adopts qualitative research methods, including text analysis and case studies, to deeply analyze successful works that have integrated opera and animation in recent years, aiming to summarize their artistic characteristics and innovative models. The research finds that the flexibility and creativity of animation can enhance the expressiveness of opera, making stylized movements, character images and storylines more dynamic and visually impactful, thereby attracting a wider audience. In addition, digital technology gives traditional opera elements a new visual context, enabling them to regain new vitality. However, the research also shows that in the process of animating traditional opera, how to find a balance among audience perception, artistic expression and business models remains a challenge that needs to be addressed urgently. Through case analysis and integration with traditional cultural elements, the rational application of digital technology and animation techniques can not only promote the innovative expression of traditional Chinese opera, but also broaden its dissemination channels and enhance its appeal among younger audiences. In the future, the practice of opera animationization needs to explore more diversified forms of expression while maintaining the core value of opera culture, in order to achieve the modernized inheritance of traditional culture.

Keywords: Chinese opera; digital technology; cultural heritage; artistic innovation; dissemination effect

1. Introduction

Chinese opera is believed to have originated from religious rituals, songs and dances, and early poetic forms, possibly dating back to the pre-Qin period, and it began to take shape as a more structured theatrical form by the Han Dynasty. However, it did not develop into a mature theatrical form until the Song and Jin Dynasties [1]. From the point of view of art morphology, it is not only a form of performance, but also an important carrier of deep cultural connotation and historical memory. Chinese opera has an important value in cultural inheritance and edification. Its history can be traced back to the pre-Qin period more than 2,000 years ago, and through the development of successive generations, it has gradually formed a rich variety of opera genres, such as Beijing Opera, Kunqu Opera,

Yueju Opera, Yu Opera, and Sichuan Opera, among others. Each type of opera has accumulated profound local cultural characteristics and historical and cultural heritage. Through its unique performance forms, opera conveys traditional Chinese culture, including customs, historical narratives, moral values, and ancient belief systems, to audiences across generations. This cultural transmission is not only embodied in the works of opera, but also in opera education and the way of transmission by word of mouth.

In modern society, the cultural value of Chinese opera art is not only embodied in its traditional significance, but also in innovation, inheritance and development. With the progress of society and the development of science and technology, the art of opera continues to keep pace with the times and incorporate new elements and forms, such as Peking Opera, which has gone to the whole country and even to the world through modern media such as movies, television and the Internet, and has become one of the representatives of Chinese culture. Cross-border collaborations between opera and other art forms have been increasingly seen, and innovations such as stage plays, animation, and musicals have greatly expanded opera's expressive power and influence. For example, the animated film "Big Fish Begonia" draws on the expressive methods of Chinese opera, incorporating the programmed movements and visual elements of opera into modern animation, which has been widely acclaimed. Through its roles in cultural transmission, aesthetic expression, and moral education, Chinese opera not only reflects the cultural essence of the Chinese nation but also reveals a unique vitality, serving as a vital cultural bridge between past and future generations.

2. The Impact of Digital Technology on Chinese Opera Art

The application of digital technology in the art of opera has dramatically changed the way opera is preserved and disseminated. Traditional opera performances rely on theater and live performances, and once the performance is over, the artistic display disappears. The introduction of digital technology allows opera performances to be permanently preserved. High-quality video recording technology can not only digitally archive opera performances, but also provide support for subsequent academic research, cultural promotion and commercialization. For example, through high-definition camera equipment, animated 3D modeling technology, virtual reality (VR) and augmented reality (AR) technology, traditional opera performances can be digitally preserved and even reproduced as virtual performances. In addition, digital technology can be used to create effects such as flowing mountains and rivers, illusory fairyland, and unpredictable sky on the stage, which greatly enhances the visual impact of the opera and makes the audience feel as if they were there. This form of digital preservation not only allows opera to spread globally but also provides strong support for the protection of China's intangible cultural heritage.

The dissemination characteristics of digital technology have also enabled the expansion of the audience scope of the art of opera. Through the Internet platform, opera performances spread rapidly across the globe and can attract audiences from different cultural backgrounds. This mode of transmission breaks the regional and linguistic limitations of Chinese opera and makes the art of opera more widely influential. Opera performances, being highly symbolic and traditionally structured in choreography, music, and format, have gained renewed vitality through the application of digital technology. Not only that, digital technology also enhances the expressive and infectious power of opera through the combination of sound design and lighting effects. The addition of these technical means not only makes traditional opera more in line with the aesthetic needs of modern audiences, but also promotes the diversification of opera art forms.

Digital technology has transformed traditional opera from being confined to theater performances and television broadcasts. The widespread dissemination of the art of opera on the Internet, especially the rise of social media, short-video platforms and online live broadcasting, has enabled it to quickly reach a younger generation of audiences, thus breaking age and geographical restrictions. For example, on platforms such as TikTok and

other short-video apps, many opera artists and enthusiasts display opera clips in the form of short videos, attracting a large number of fans and thus promoting the popularization and rejuvenation of opera.

The intervention of digital technology has promoted the popularization and innovation of opera education. Through digital platforms, teaching resources for opera have been more conveniently disseminated and shared, allowing students and enthusiasts to learn opera skills and theory through online courses and virtual classes. For example, some famous opera masters have taught opera performance skills through live lectures, attracting many students. This format not only removes geographical barriers but also lowers the learning threshold, enabling more people to access and study the art of opera. At the same time, digitalized teaching methods make opera education more lively and interesting, helping to stimulate students' interest in learning.

3. Cross-Border Integration of Animation and Opera Art: An Aesthetic Affinity and Theatrical Parallels

The integration of Chinese traditional opera and animation is not merely a fusion of artistic forms but a convergence of two highly stylized and performative art forms. Both disciplines rely on symbolism, exaggerated expressions, and choreographed movement to convey emotion and narrative. Traditional Chinese opera, with its ritualized gestures, coded face painting, and role-type distinctions (e.g., Sheng, Dan, Jing, Chou), aligns seamlessly with animation's inherent exaggeration and visual dramatization. Scholars have noted that animation possesses an "inbuilt theatricality" that naturally resonates with the structured expressiveness of opera, making it an ideal medium for cultural reinterpretation.

3.1. From Representation to Hybridization: Notable Case Studies

In recent years, a range of successful works has demonstrated the innovative potential of integrating operatic aesthetics into animated narratives. Animated films like Big Fish Begonia and White Snake subtly incorporate visual elements, gestures, and costume designs inspired by Kunqu and Peking Opera traditions. These works do not replicate traditional operas, but rather embed their visual and performative DNA into modern storytelling, creating what might be called aesthetic hybridity.

More direct integrations are observed in works such as Cross Slope Strikes the Shop, which employs traditional role-specific movement within its animated character design. According to research, these performances are described as "object-context-context-imagery" sequences, where animated bodies are imbued with the aesthetic and kinetic codes of opera [1]. In these cases, animation does not act as a passive carrier but as an active re-performer of operatic structure.

Furthermore, these productions often experiment with multiple visual formats — 2D, 3D, ink-and-wash, or stop-motion — to replicate the mood, rhythm, and visual logic of Chinese operatic staging. Such formal diversity reflects a deeper process of cultural translation, where animation not only visualizes opera but internalizes its symbolic logic.

3.2. Creative Tensions: Challenges in Form and Fidelity

Despite the growing number of successful integrations, critical tensions persist. One of the most notable issues is the challenge of aesthetic balancing: while animation tends toward fluidity and spectacle, opera thrives on restraint and formalism. Over-reliance on visual novelty may lead to a loss of the traditional cadence and symbolic subtlety that define opera. This tension raises the question of how to modernize without eroding the traditional essence and symbolic depth of opera.

Moreover, some attempts at fusion fall into the trap of "surface-level Orientalism", borrowing only the visual motifs of opera without integrating its structural and performative depth. A further concern is the influence of Western animation norms — particularly

Disney-like character exaggeration — which may dilute the authenticity of operatic characters, replacing culturally nuanced gesture codes with generic expressions.

Therefore, scholars advocate for a mode of "mediated authenticity" — a creative methodology that respects operatic traditions while exploring animation's narrative potential. [2] warns that failure to align these two art forms may result in "aesthetic dissonance" where neither opera nor animation fully resonates with the audience.

3.3. Theoretical Significance and Future Pathways

This cross-border integration challenges the traditional boundary between elite cultural heritage and popular visual culture. On one hand, animation opens up opera to new audiences, especially younger generations unfamiliar with its symbolic system. On the other hand, opera lends animation a deeper cultural dimension, turning entertainment into intercultural pedagogy.

Animation contains theatrical elements because theater represents a well-established and mature form of performing arts. It emphasizes the virtual nature of the art, such as exaggerated modeling, programmed movements, face painting, specific singing, and a specific connotation for every move. Opera and animation have a natural fit in terms of expression, and the programmed movements, exaggerated expressions and highly dramatized narrative style common in opera performances coincide with the performance characteristics of animation. Therefore, animation can bring the aesthetic style of traditional opera into modern animation through the reproduction of opera movements, costumes, and backgrounds, thus attracting more young viewers.

It is worth mentioning that China's opera animation character performances go beyond merely superficially interpreting Chinese opera through Disney-like visual exaggeration. They integrate Eastern and Western elements and, while imitating the programmed performances of opera, create cross-border works by blending various art styles. The term "cross-border creation" here refers to the experimentation and exploration of various art styles, such as 2D, 3D, stop-motion, ink-and-wash styles, and other forms of virtual digital animation. Animation artists, equipped with professional training and keen sensibility, use virtual digital characters to vividly illustrate the plot and rhythm of the narrative. This approach influences plot development while striving to portray the "human" characteristics of animated figures, creating rich and lifelike characters. They strive to present animated characters with human-like qualities, forming a rich embodied aesthetic. For example, within the Dan role types, there are Qingyi, Dahu, Wudan, and Laodan, among others. In the opera animation "Cross Slope Strikes the Shop", Sun Erniang's jumping down from the table is a typical Wu Dan [3]. The creative freedom of animation also enables the realization of fantasy scenes that are difficult to present on stage, enhancing the dramatic impact and visual richness of opera stories [4]. As another example, the mythological scenes in Journey to the West are perfectly presented through animation, immersing the audience in the fantasy-filled world of opera. These works not only promote the culture of Chinese opera but also successfully attract more young audiences to engage with traditional arts through modern audiovisual language. These works not only retain the aesthetic essence of opera but also make the stories more modern and appealing through animated presentation.

The combination of animation and opera breaks the boundaries between traditional art and modern media, and provides a brand-new communication method and development path for opera art. The popularity of animation opens up new avenues for the dissemination and promotion of opera art. Traditional opera has a limited scope of dissemination due to the limitations of the performance form, while animation, as a medium with strong popularity and wide audience, can help opera art break through these limitations. With the development of digital media, more and more animated works of opera are disseminated through online platforms, attracting a large number of young audiences. Do-

mestic animated films such as "Big Fish Begonia", "Return of the Great Sage", and "Umbrella Girl" incorporate numerous traditional Chinese opera elements. Their visual design integrates costumes, props, and set designs from opera, allowing audiences to enjoy the animation while appreciating the aesthetic charm of traditional opera [5]. In addition, the rise of short video platforms has also provided new communication channels for opera animation, spreading classic opera clips on social media through creative editing and secondary creation, which not only enhances the dissemination power of opera, but also attracts the attention and love of more young audiences.

In the field of education, the integration of animation and opera has also shown an important role. According to Li Zehou, the fundamental role of aesthetic education is to cultivate virtue through the appreciation of beauty and to seek truth through artistic expression. Since ancient times, our literature has attached great importance to the combination of artistic form and ideological content in order to achieve the purpose of teaching for pleasure.

4. The Role of Digital Platforms in Promoting the Dissemination of the Art of Opera

The development of digital communication technology provides a brand new possibility for the protection and inheritance of cultural heritage [6]. The emergence of digital platforms, as a product of the integration of science and art, provides a new medium for the dissemination of opera art. This development forms the foundation for the growth of traditional opera culture. At the same time, digital platforms bring unprecedented opportunities and challenges for the promotion and preservation of traditional opera. It is important to consider how to extract the essence of traditional culture from the subject matter and expressive forms of creation, integrate traditional aesthetic values and humanistic sentiments, and achieve an organic combination of traditional cultural symbols with digital technology. By analyzing the various functions and practical applications of the digital platform, it can be seen that the digital platform plays an important role in expanding the audience of opera, promoting the inheritance of opera, and enriching the expression forms of opera.

Digital art works must fully or partially use digital means in the realization process, including computer illustration, network art, digital special effects, digital photography, virtual reality, interactive installations, digital music and so on. Due to the unique way of expression of digital art, from the perspective of cultural communication, digital art has features and advantages that are incomparable to traditional communication methods [7]. Traditional opera dissemination mostly relies on theater performances or specific cultural activities, and the audience groups are often confined to specific geographical and cultural backgrounds. The emergence of digital platforms has broken this limitation, and through the popularization of the Internet, opera performances have been disseminated globally. Many well-known opera performances, such as Peking Opera, Kunqu Opera, and Yueju Opera, have been recorded in high definition and uploaded to various video platforms, including Bilibili, Youku, and iQiyi. These platforms not only have large user bases but also offer powerful social features, allowing viewers to comment, share, and interact during performances. This creates a more immersive and multidimensional network for the dissemination of opera culture. This way of communication not only attracts more domestic audiences, but also makes it easier for foreign audiences to come into contact with and understand Chinese opera art, thus promoting the internationalization of opera communication.

Once highly popular among the masses, traditional opera served as an important medium for moral education for a long time, with its expressed themes often representing moral and cultural values widely accepted by the audience. Nowadays, Viewers share their post-performance feelings on digital platforms and engage in discussions with other opera enthusiasts. This interactive form promotes the diverse dissemination of opera cul-

ture. In some online communities dedicated to opera, viewers can post their interpretations of certain opera works, participate in discussions, or watch the secondary creations of opera lovers. This interaction not only deepens the audience's understanding of opera art but also opens up more possibilities for the dissemination of opera culture [8]. However, it should be noted that due to the openness of digital platforms, the production and dissemination thresholds of opera content have been lowered to meet market demands. As a result, some opera works may have an excessive commercialization tendency, leading to the proliferation of low-quality works on the platforms, a decline in content quality, and even the loss of their original artistic value and cultural connotations, thereby affecting the audience's overall perception and evaluation of opera art.

5. Development Trends

Along with the increasing maturity of VR and AR technologies, the expression of opera art has been greatly enriched [9]. Through VR technology, the audience is able to experience an immersive opera performance and watch every detail of the performance in 360 degrees, instead of enjoying it from a single perspective. This immersive experience not only enhances the audience's sense of participation, but also helps the art of opera break the traditional stage space limitations. For example, classic opera works such as Dream of the Red Chamber reproduce the performance scenes in classical gardens through VR technology, making the audience feel as if they were in them. At the same time, AR technology also brings new possibilities for the dissemination of opera art. Through intelligent devices, the audience can also see virtual opera characters interacting with the scene in the real world, thus enhancing the fun and interactivity of viewing.

In the new media era, people have access to abundant information resources via the Internet. To achieve rapid dissemination and efficient development of local opera culture, it is necessary to establish professional online platforms dedicated to opera. Furthermore, employing advanced information technologies can effectively promote the dissemination and development of local opera [10]. The application of multimedia technology makes the art of opera no longer limited to traditional stage performance, but can be presented through animation, film and television, games and other forms. The animated movie "Big Fish Begonia" visually integrates elements of opera and successfully attracts the attention of a large number of young viewers through its innovative narrative. The combination of games and opera is gradually emerging, integrating opera stories into game plots, allowing players to experience the cultural charm of opera while being entertained. This cross-border integration not only broadens the communication channels of opera, but also injects new vitality into it. With the continuous development of digital technology, the expression of opera art will be more diversified and innovative.

6. Conclusion: Opportunities and Challenges

While digital technology brings opportunities to the art of opera, it also faces challenges. Although digital communication can expand the influence of opera, it also faces the risk of homogenization of content and dilution of traditional elements. How to maintain its core artistic values under the influence of modern technology has become a challenge for creators. Over-reliance on digital means may lead to the weakening of the authenticity and flavor of opera performances, causing audiences to enjoy the visual effects while ignoring the artistic value of the opera performances themselves. Some opera works have been over-commercialized on digital platforms to cater to mass market demands, resulting in the neglect of the essence of opera art. How to balance the flexible performance of animation and the programmed structure of opera is a difficult point in creation. Creators need to rationally use digital technology on the basis of maintaining the tradition of opera, in order to avoid the phenomenon of disconnecting formal innovation and cultural connotation.

With the rapid development of digital technology, opera practitioners need to possess higher technical literacy. This places new demands on traditional opera performers, who must not only master performance skills but also understand and utilize digital technology for creation and dissemination. The impact of digital technology on Chinese opera art is multidimensional, which not only promotes the inheritance and innovation of opera art, but also brings new challenges.

Artificial Intelligence Generated Content (AIGC) technology has a wide range of applications in the digital dissemination of cultural heritage. The integration of opera and animation across the border also faces challenges. On the one hand, how to maintain the uniqueness and cultural connotation of opera art in animation creation is an issue that creators need to think deeply about. As a traditional art form, the aesthetic characteristics and cultural value of opera lie in the programmed and symbolic nature of performance, while animation is more inclined to visual impact and fluency. How to balance the qualities of the two art forms in the process of integration, so that the animation can retain the traditional aesthetics of opera, but also meet the aesthetic needs of the audience has become a creative difficulty. On the other hand, high-quality opera animation works have high production costs, long cycles and large capital investment, which also put forward higher requirements for creators. The cross-border integration of animation and opera art is full of both opportunities and challenges, and this integration not only provides new ideas for the inheritance and development of opera art, but also injects rich cultural connotations for animation creation. In the future development, how to better combine the advantages of the two art forms to realize innovation and inheritance will become an important exploration direction. At present, there is a relative lack of talents with such composite skills, and the cultivation of creators who understand both opera and digital technology is an urgent issue facing the deep integration and development of opera art and digital technology.

The introduction of digital technology and animation has brought unprecedented opportunities for the development of the art of opera. The digital platform breaks the limitations of traditional communication methods and allows more people to have access to and understand the culture of opera, thus increasing the popularity and influence of opera. The integration of animation and opera provides a new way for the dissemination and innovation of traditional culture, allowing more young audiences to understand and love Chinese opera. This collision of technology and culture not only promotes the modernization of opera art but also opens up possibilities for more cross-border cooperation. With the continuous progress of technology, the combination of opera and digital technology will continue to deepen, promoting Chinese traditional culture to take on a new vitality in the new area.

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