

Research on the Collaborative Development of Popular Science Animation Content Creativity and Digital Cultural Tourism Brand in Huagaoxi National Nature Reserve

Hao Xie

Sichuan University of Science and Engineering, Zigong, 643000, China

Abstract: This study aims to explore the ecological value of Huagaoxi National Nature Reserve through the form of popular science animation, and explore its application in the dissemination and promotion of digital cultural tourism brand, so as to realize the coordinated development of popular science education and tourism industry. Based on the national policy theory and the research object, the paper puts forward the creative scheme of popular science animation content, and discusses its collaborative development mode with the digital cultural tourism brand.

Keywords: Popular Science Animation; Digital Cultural Travel; Brand Collaboration; Drawing Stream.

1. Introduction

In the context of globalization and information age, the importance of popular science education is becoming increasingly prominent. It is not only an effective way to improve the public's scientific literacy, but also a key factor to promote the sustainable development of society. With the rapid development of digital technology, the carrier and form of popular science education are also constantly innovating. Among them, popular science animation, as a new means of education, has attracted wide attention because of its vivid image and easy to understand characteristics. By transforming complex scientific knowledge into intuitive audio-visual language, popular science animation greatly improves the attraction and communication efficiency of popular science content.

As an important ecological reserve in China, Huagaoxi National Nature Reserve has rich biodiversity and unique natural landscape. However, how to effectively convey its ecological value and enhance the public awareness of ecological protection has always been a challenge in the management of protection areas. In recent years, with the rise of digital cultural tourism, the combination of popular science education and tourism industry has become a new development trend. Through the development of digital cultural tourism brand, it can not only enhance the interest and interactivity of popular science education, but also promote the development of local economy, and achieve a win-win situation between ecological protection and economic development.

This research takes Huagaoxi National Nature Reserve as the research object, aiming to explore the role of popular science animation in transmitting the ecological value of the reserve and enhancing the public awareness of environmental protection, and study how to promote the common growth of regional economy and ecological protection through the coordinated development of popular science animation and digital cultural tourism brand. Based on the national policy theory and combined with the actual situation of Huagaoxi, this study will put forward the creative scheme of popular

science animation content, and explore its collaborative development mode with the digital culture and tourism brand.

2. Research Background and Current Situation

With the continuous advancement of ecological civilization construction, nature reserves, as an important carrier of ecological protection, pay increasing attention to their function of popular science and education. Huagaoxi National Nature Reserve, with its unique natural landscape and rich biodiversity, has become an ideal place for ecological education and natural experience. However, how to effectively transform the natural and cultural value of the reserve into the popular science content acceptable and easy to understand by the public is still an urgent problem to be solved.

As a means of communication combining scientific knowledge and art form, popular science animation has been widely used around the world. Through vivid visual effects and fascinating narrative methods, it can improve the interest and acceptance of scientific knowledge, especially for young people. Internationally, many nature reserves and national parks have successfully used popular science animation to promote their natural landscape and ecological protection work, such as a series of popular science short films of Yellowstone National Park, which not only popularized geological knowledge, but also enhanced the public's understanding of the park protection work. The Popular Science education program in Banff National Park in Canada features magnificent natural scenery and abundant wildlife.

In China, with the introduction of policies such as the Outline of the National Scientific Literacy Action Plan (2021-2035), the creation and application of popular science animation has been supported and encouraged by the policies. Various kinds of popular science animation works have sprung up, covering many fields from nature protection to history and culture. However, there are still few studies on the collaborative development of popular science animation content creativity and brand in specific nature reserves. Especially, there is still a lack of systematic theoretical and

practical guidance on how to combine popular science animation with digital cultural tourism brand to achieve a win-win situation between popular science education and tourism industry. In recent years, the state has been constantly strengthening the promotion and implementation of science popularization, and at the same time paying attention to the combination of science popularization with cultural industry and tourism industry, to promote the innovation and development of science popularization industry. As early as 2009, the Ministry of Culture and the National Tourism Administration of the Ministry of Culture issued the Guiding Opinions on Promoting the Combined Development of Culture and Tourism, encouraging the combination of cultural creativity, film and television production, animation and games and other industries with the tourism industry, and developing popular science tourism products rich in cultural connotation and tourism value. In 2021, The State Council promulgated the Outline of the Action Plan for National Science Literacy (2021-2035), and the state and society encourage the use of new media and other means to innovate the communication methods of popular science products and services in expanding the channels and capabilities of science communication. Positive measures have been taken to improve the interest and interactivity of popular science content. As General Secretary Xi Jinping has pointed out, "Scientific and technological innovation and scientific popularization are the two wings of innovative development. This important indicator spirit has also become a new direction of cultural and tourism development. In 2022, The General Office of the State Council issued the Opinions on Further Strengthening the Popularization of Science and Technology in the New Era, which encourages all sectors of society to participate in the science popularization work, support the development of the science popularization industry, and promote the integration of science popularization with culture, tourism, sports and other industries

3. Study Design

This study focuses on the Painting Creek National Nature Reserve. Painted Creek has a unique ecological environment and a rare biodiversity. It is not only a treasure house of biodiversity, but also an important base for scientific research, ecological protection and popular science education. Therefore, this study will focus on how to use the medium of popular science animation to effectively convey the natural value and ecological significance of the reserve, enhance the public's understanding of the natural environment and biodiversity, and enhance the brand awareness of Huagaoxi. As an important ecological area in Sichuan Province, the potential of popular science education and ecological tourism has not been fully tapped. At present, the science popularization work in the reserve is lack of innovation and interactivity. At the same time, as an emerging tourism mode, digital cultural tourism has shown great potential in improving the tourism experience and expanding the tourism market. How to combine popular science animation with digital cultural tourism brand to improve the popularity and attraction of Painting Creek has become the core issue of this study. Follow a systematic engineering planning process to ensure that the final product is both scientifically accurate and educational.

First, at the initial stage of the project, the natural ecology, biodiversity, geological characteristics and cultural

background of The Creek National Nature Reserve were studied in depth. Through collaboration with ecologists, geographers, and local conservation agencies, the core themes of popular science animation are determined to highlight the unique ecological value and conservation significance of Painting Creek. Collect detailed information on the Painting Creek National Nature Reserve, including its geographical location, ecosystem, biodiversity, geological features, cultural background, and existing conservation measures and challenges. Based on the survey results, the core theme of popular science animation was selected to show the unique biodiversity of Painting Creek.

Second, in the early stage of the creation. Early writing includes script segmentation and character design. Follow the science in the development of the content. Work with ecologists, geologists, biologists, and managers of the reserve to ensure that the scientific information in the animation is accurate. These experts will provide expertise on Painting Creek, including its ecosystem, endemic species, geological features, and conservation measures. The core scientific concepts extracted from expert consultation will be the basis of animation education content. For example, pictorial Creek biodiversity, specific ecological conservation projects, or geological history could be emphasized. Transform scientific concepts into specific educational points that will run through the narrative of the animation. The educational points should be concise and clear, easy for the audience to understand, and can stimulate the audience's curiosity and desire to explore. Develop a fascinating storyline based on scientific content and educational points. Set interesting characters for the story, which can be real animals, fictional creatures, or human characters. The characters should have a unique personality and motivation to attract the attention of the audience and help convey scientific information. Write detailed scripts based on storylines and character settings. The script should include the scene description, character dialogue, narration, and sound hints. The dialogue and the narration should be concise and interesting, Ability to clearly convey scientific concepts and education

Third, the mid-production stage. In the animation production and technical realization stage, the story in the script and the shot script is transformed into the visual and auditory fascinating animation works. Create conceptual art and animation sketches to verify that the overall style and feel of the animation complies with the project objectives and desired effects. Use Adobe Animate and Adobe After Effects to draw the keyframes. Keyframes define the main action and expressions of the characters and scenes. Insert intermediate frames between keyframes to create a smooth animation transition. This process can be done manually or using the automatic interpolation function of the software.

Fourth, the late synthesis. Record high-quality sound effects and voice acting, including natural ambient sounds, character dialogue, and educational narration. Sound effects and dubbing will enhance the appeal of the animation and improve the audience's viewing experience. Through professional video editing software, the animation sequence is edited into coherent movies. Add the necessary special effects, such as light and shadow changes, time passage, etc., to enhance the visual effects of the animation.

4. Results of the Study

The focus of this study includes the accuracy and depth of popular science content, and determines the depth of popular

science content, so that it can not only attract the general audience, but also meet the educational needs. Secondly, the narrative and the creative expression of stories. The success of popular science animation largely depends on the appeal of the narrative. How to combine the scientific knowledge with the story plot, so that the audience can learn the scientific knowledge while enjoying the story, is one of the key points of the research. In addition, creative expressions, such as character design, scene building and animation style, are also key to enhancing the appeal of animation. In addition, with the realization and innovative application of technology, this research chooses two-dimensional animation as the expression mode, which is conducive to the later development of series animation. This study systematically explores the possibility and practical path of the collaborative development of popular science animation content creativity and digital cultural tourism brand in Huagaoxi National Nature Reserve. Through the close cooperation of interdisciplinary teams, we have successfully developed a series of popular science animations that are both scientifically accurate and artistically attractive. These animations not only effectively convey the ecological value and conservation significance of Painting Creek, but also significantly enhance the public awareness and interest in the reserve through innovative narrative techniques and advanced animation techniques. The research results show that popular science animation, as a powerful communication tool, can be promoted. Public awareness of environmental protection plays an important role in promoting regional tourism development. Through the combination of popular science animation and digital cultural tourism brand, a series of attractive digital cultural tourism products and services have been created for Painting Creek, which not only enhances the brand image of the reserve, but also injects new life into the development of local economy.

5. Conclusion

The innovation of the research lies in that it adopts the interdisciplinary research method, integrates the knowledge of animation art, ecological protection, digital marketing and other disciplines together, and breaks the boundaries of traditional popular science education. By deeply excavating the natural resources and ecological environment characteristics of the drawing stream, and combining with the needs and interests of the audience, we have designed a scientific, artistic and interesting popular science animation content. At the same time, this study also explores the innovative construction mode of digital cultural tourism brand, as well as the collaborative development mechanism between popular science animation and digital cultural tourism brand, which provides new ideas and strategies for the deep integration of popular science education and tourism industry.

The social significance of this study is that it not only improves the public understanding of the ecological and cultural value of Painting Creek National Nature Reserve, but also promotes the public willingness and actions to participate in nature conservation through the wide dissemination of popular science animation. In addition, the research has promoted the development of the local digital cultural tourism industry, brought more attention and resources to the reserve, and helped to achieve a win-win situation between ecological protection and economic development. In the long run, this coordinated development mode of popular science education

and tourism industry plays an important demonstration role in promoting the overall sustainable development of the society.

As an effective science communication tool, the popular science animation of Huagaoxi National Nature Reserve can not only enhance the public understanding of the unique ecosystem and biodiversity of the reserve, but also enhance its awareness of environmental protection. Through the combination of popular science animation and digital cultural tourism brand, the coordinated development of popular science education and tourism industry can be realized, and provides a new perspective and strategy for the sustainable development and ecological protection of Painting Creek. In addition, this study also shows how to improve the educational value and appreciation of popular science animation through innovative content creativity and advanced digital technology, so that it can become a bridge between scientific knowledge and public understanding.

Acknowledgments

Fund Project: General Project of Cultural and Tourism Industry Collaborative Innovation Development Research Center, Key Research Base of Luzhou Social Science Application Research and Quality Improvement Project (JD-WL2407).

References

- [1] Xu B, Zhong Y & Zhang Y. (2022). Conservation status and influencing factors of *Cyathea ferulosae* in Xuexi National Nature Reserve based on species distribution model. *Western (6) of the forestry science*, 53-61. The doi: 10.16473 / j.carol carroll nki xblykx1972.2022.06.008.
- [2] Li Cheng, Zhang Wenyan, Xiong Shan, Wang Yan, Liang Qianqian, Jiang Jianping & Xu Haigen.(2022). Application of Bayesian weight estimation method in amphibian diversity observation: a case study of Xuejianshi Nature Reserve in Sichuan Province. *Journal of ecology and rural environment* (4), 504-510. The doi: 10.19741 / j.i SSN. 1673-4831.2021.0122.
- [3] Li H, Bao W K & Li F L. (2021). Species composition and structure of tree layer of *Alseodaphne spinulosa* community in Xuelianxi Nature Reserve. *Application and environmental biology journal* (05), 1399-1404. The doi: 10.19675 / j. carol carroll nki. 1006-687 - x. 2020.05047.
- [4] Xu L J, He G Q & Du X T. (2015). Floristic study on the inae of the *Maculinea borealis* in the GExi Nature Reserve. *Journal of southwest university (natural science edition)* (7), 75-81. The doi: 10.13718 / j.carol carroll nki XDZK. 2015.07.011.
- [5] Ju W B, Gao X F & Bao W K. (2014). Population structure and regeneration of rare tree ferns in Xuelixi National Nature Reserve. *Journal of Plant Sciences* (02),113-121.
- [6] The State Council. "Notice of The State Council on Issuing the Outline of the Action Plan for Scientific Literacy of the Whole People (2021-2035) The Outline of the Action Plan for Scientific Literacy of the Whole People (2021-2035) _No. 19 State Council Communique of 2021_Gov.cn." *Www.gov.cn*, 3 June 2021, www.gov.cn/gongbao/content/2021/content_5623051.htm.
- [7] The State Council. "Notice of The State Council on Issuing the Outline of the Action Plan for Scientific Literacy of the Whole People (2021-2035) The Outline of the Action Plan for Scientific Literacy of the Whole People (2021-2035) _No. 19 State Council Communique of 2021_Gov.cn." *Www.gov.cn*, 3 June 2021, www.gov.cn/gongbao/content/2021/content_5623051.htm.

- [8] Ministry of Culture. "Guiding Opinions of the Ministry of Culture and the National Tourism Administration on Promoting the Combined Development of Culture and Tourism." [Zwgk.mct.gov.cn](http://zwgk.mct.gov.cn), 31 Aug. 2009, zwgk.mct.gov.cn/zfxxgkml/scgl/202012/t20201206_918160.html.
- [9] Hao Yuran, "The General Office of the Central Committee of the Communist Party of China, The General Office of the State Council, issues Opinions on Further Strengthening the Popularization of Science and Technology in the New Era" _ Relevant Documents of the Central Government_Chinadaily.com." [Www.gov.cn](http://www.gov.cn), 2022, www.gov.cn/zhengce/2022-09/04/content_5708260.htm. Accessed 27 Oct. 2024.