

Research on the Digital Integration and Innovative Communication Mode of Popular Science Popularization of Xizang Medicine and Xizang Medicine Culture

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Abstract: The paper focuses on the innovation strategy research on the digitalization of science popularization of the collection resources of Xizang Natural Science Museum's "Plateau Treasure - Xizang Medicine and Xizang Medicine". This article analyzes the significance of digitizing popular science resources in library collections, and elaborates on innovative strategies from the aspects of resource digitization preservation, innovative design of popular science content, and construction of communication platforms. At the same time, it points out technical difficulties and countermeasures in the practical process, as well as prospects for future development, aiming to provide new ideas and methods for the wider dissemination and inheritance of Xizang medicine and Xizang medicine culture, and promote the sustainable development of digital popular science popularization of Xizang medicine and Xizang medicine.

Keywords: Xizang Medicine; Collection Resources; Digitalization of Science Popularization; Innovation Strategy.

1. Introduction

Xizang medicine and Xizang medicinal culture, as an important component of traditional Chinese medicine, carry the wisdom of the Xizang people's harmonious coexistence with nature for thousands of years. Its unique theoretical system, rich diagnosis and treatment experience, and profound cultural connotation occupy an important position in the field of traditional medicine in the world. Taking the "Treasure of Plateau Xizang Medicine and Xizang Medicine" collection resources of Xizang Natural Science Museum as an example, it covers various types of ancient books and documents, medicinal specimens, medical devices, etc., and is a precious physical carrier of Xizang medicine and Xizang medicine culture. With the rapid development of digital technology, the protection and dissemination of traditional cultural resources are undergoing profound changes.

2. The Importance of Digitalization in the Popularization of Xizang Medicine and Culture

2.1. Protecting and Inheriting Precious Cultural Resources

The ancient books and documents in the collection resources of Xizang medicine and Xizang medicine culture are generally old and easily damaged by natural environment and human factors; Medicinal specimens may also deteriorate and be damaged over time. By digitizing popular science and utilizing advanced technologies such as scanning and 3D modeling, these precious cultural resources are transformed into digital form for permanent preservation, thereby reducing the risk of resource damage and loss and ensuring the long-term inheritance of precious materials related to Xizang medicine and medicinal culture. As pointed out in reference[1], digital technology provides a new and effective way for the protection of cultural heritage, which can break

through the limitations of traditional protection methods and achieve long-term preservation of cultural resources.

2.2. Expand the Scope of Popular Science Audience

The traditional popularization of Xizang medicine and Xizang medicine culture is limited by the exhibition space and opening hours of natural science museums, resulting in a limited audience for science popularization. After the digital display of popular science cultural resources, the Internet platform can be used to enable the public to access the popular science information of Xizang medicine and Xizang medicine culture anytime and anywhere, no matter where the audience is, as long as the network conditions are available, thus breaking the constraints of region and time, greatly expanding the coverage of popular science audiences, and giving more people the opportunity to contact and understand Xizang medicine and Xizang medicine culture. Related studies have also shown that digital popular science resources can significantly expand the audience of cultural popular science, improve the efficiency and scope of cultural dissemination[2].

2.3. Enhance the Effectiveness and Interactivity of Science Popularization

Digital science popularization can adopt various forms such as animation, video, virtual reality (VR), augmented reality (AR), etc. Present abstract and profound knowledge of Xizang medicine and Xizang medicinal culture to the audience in a more vivid, intuitive, and interesting way. At the same time, interactive activities such as online Q&A and virtual experiences can be set up to enhance the interaction between the audience and popular science content, thereby stimulating the public's interest and desire to explore Xizang medicine and Xizang medicine culture, and improving the effectiveness of popular science work. The research results of reference[3] indicate that the popularization effect of multimedia interactive forms can more effectively improve

the audience's participation and acceptance of knowledge.

3. Innovative Strategies for Digitalization of Science Popularization

3.1. Innovation in Digital Preservation of Cultural Resources

a) Integration of multimodal digital acquisition technology

For ancient literature, in addition to traditional high-resolution scanning technology, the introduction of artificial intelligence assisted text recognition and repair technology is of great significance not only for improving the accuracy of text recognition, but also for repairing damaged and blurry text. For medicinal specimens, using hyperspectral imaging technology to obtain information on the specimens under different spectra can more comprehensively and effectively record the characteristics of medicinal materials. Combining 3D reconstruction technology to construct realistic 3D specimen models, allowing the public to observe the morphological structure of medicinal herbs from different perspectives. For medical devices, the combination of laser scanning and structured light scanning can accurately obtain their geometric dimensions and appearance details, generating high-quality 3D digital models.

b) Establish a digital resource management system

Based on blockchain technology, build a digital management system for Xizang medicine and herbal collection resources that is decentralized, tamper proof, and traceable. The system can uniquely identify each digital resource and record information such as the collection time, collection method, and collection personnel, ensuring the authenticity and integrity of cultural resources. At the same time, distributed storage technology is adopted to store resource data on multiple nodes, improving data security and reliability, and preventing data loss and damage. Reference[4] conducted an in-depth exploration of the application of blockchain technology in cultural resource management, providing a theoretical reference for us to construct this system.

3.2. Innovative Design of Popular Science Content

a) Storytelling and Situational Narrative

Using important figures and events in the development of Xizang medicine and Xizang medicine culture as clues, construct a storytelling science popularization content. For example, it tells the arduous process of Yutuo Ningma Yundan Gongbu in compiling the "Four Medical Classics" and the profound influence of this classic work on the development of Xizang medicine. By setting up contextualized science popularization scenarios, such as simulating the diagnosis and treatment scenes of ancient Xizang medicine, the public can experience the unique charm of Xizang medicine and enhance the attractiveness and infectiousness of science popularization content. Reference[5] emphasizes the important role of storytelling in cultural science popularization, which can make science popularization content more attractive and memorable.

b) Interdisciplinary integration of science popularization

Combining knowledge of Xizang medicine and Xizang

medicinal culture with interdisciplinary knowledge such as biology, chemistry, and geography for popular science. For example, when introducing Xizang medicinal herbs, not only are their medicinal effects explained, but also the growth environment and plant classification of the herbs are analyzed from a biological perspective, and the effective ingredients of the herbs are analyzed from a chemical perspective, allowing the public to have a more comprehensive understanding of the scientific principles behind Xizang medicine and broaden their knowledge horizons.

3.3. Innovation in Building Science Popularization Communication Platforms

a) A science popularization experience platform combining VR and AR

Using VR technology, create an immersive virtual exhibition space for Xizang medicine and Xizang medicine culture museums. The public can freely shuttle through the virtual museum by wearing relevant VR devices, observe the collection resources and culture of the museum up close, and listen to professional explanations. At the same time, with the help of AR technology, mobile applications can be developed. When the public uses their mobile phones to scan physical exhibits or specific signs in museums, rich digital information related to them will be presented on the phone screen, such as 3D model display, animation demonstration, historical background introduction, etc., achieving interactive integration of reality and virtuality, enhancing the public's visiting experience and science popularization effect. Reference[6] demonstrated the excellent application effects of VR and AR technologies in museum science popularization, providing practical reference for our platform construction.

b) Integrate social media and short video platforms for dissemination

Make full use of the rapid communication advantages of social media and short video platforms such as Weibo, WeChat official account, Tiktok, Kwai, etc. to regularly publish interesting and informative Xizang medicine and Xizang medicine culture and popular science content. For example, creating short and concise science popularization videos to introduce small knowledge and tips about Xizang medicine and Xizang medicine culture in a vivid and interesting way; And carry out online science popularization activities, such as knowledge quiz competitions, topic discussions, etc., to attract public participation and expand the dissemination scope and influence of Xizang medicine and Xizang medicine culture science popularization. The research in reference[7] shows that social media and short video platforms are important channels for cultural dissemination, which can quickly gather a large audience.

4. Problems and Countermeasures in the Practice of Digital Science Popularization

4.1. Technical Difficulties and Coping Strategies

a) There is pressure in data processing and storage

In the process of multimodal digital information acquisition, a large amount of related data such as images, videos, 3D models, etc. will be generated, which will bring enormous pressure to the processing and storage of data. The coping strategy is to adopt distributed computing technology

to allocate data processing tasks to multiple computing nodes, thereby improving data processing efficiency; At the same time, large capacity and high-performance cloud storage services such as Alibaba Cloud, Tencent Cloud, etc. are introduced to meet the storage needs of massive data, and data compression, deduplication and other technologies are used to optimize data storage and reduce storage costs. Reference[8] conducted research on big data processing and storage technology, providing technical support for us to solve data related problems.

b) The application bottleneck of virtual reality and augmented reality technology

The application of VR technology and AR technology in Xizang medicine and Xizang medicine cultural popularization faces problems such as high equipment costs, difficulty in content production, and the need to optimize user experience. The solutions include actively collaborating with hardware manufacturers to promote the localization and cost reduction of VR and AR devices; Strengthen cooperation with professional content production teams and improve the level of science popularization content production; Meanwhile, by continuously optimizing the interaction design and performance of VR and AR applications through user feedback, we aim to enhance the user experience.

4.2. Shortage and Cultivation of Talents

The popularization and digitization of Xizang medicine and Xizang medicine culture require both professional knowledge of Xizang medicine and Xizang medicine culture, as well as composite talents with digital technology and popular science dissemination capabilities. At present, there is a relative shortage of such talents. To this end, education and training in relevant disciplines should be strengthened, and specialties or courses integrating Xizang medicine and Xizang medicine culture with digital technology should be set up in Xizang's universities and vocational colleges to cultivate professional talents; At the same time, regular training on Xizang medicine and herbal knowledge, digital technology, and popular science dissemination will be organized for existing museum staff to enhance their comprehensive quality and professional abilities. Reference[9] emphasizes the crucial role of talent cultivation in the development of cultural digitization.

5. Future Prospects of Digitalization of Science Popularization Resources

5.1. Deepen The Integration with Artificial Intelligence Technology

With the continuous development of artificial intelligence technology, its application in the digitalization of Xizang medicine and Xizang medicine culture popularization can be further deepened in the future. For example, developing an intelligent question answering system using natural language processing technology to provide the public with more convenient and accurate answers to Xizang medicine knowledge; By using machine learning algorithms to analyze public browsing behavior, interest preferences, and other data, personalized science popularization content recommendations can be achieved to improve the pertinence and effectiveness of science popularization. Reference[10] conducted a prospective study on the application of artificial intelligence in the cultural field, providing direction for our future development.

5.2. Strengthen International Exchanges and Cooperation

Xizang medicine and its culture are important components of traditional medicine in the world. Through the digital display of popular science, communication and cooperation with other traditional medical institutions and museums internationally can be strengthened. Share the experience and achievements of digitalization in the popularization of Xizang medicine and Xizang medicine culture, introduce advanced science popularization concepts and technologies at home and abroad, and jointly promote the international development of traditional medical science popularization, so that Xizang medicine and Xizang medicine culture can be widely spread and recognized worldwide.

5.3. Promote the Digitization of Science Popularization and The Integration of Industry

Explore the integrated development model of digitalization of Xizang medicine and Xizang medicine culture popularization with cultural and tourism industries. Develop cultural and creative products based on digital content of Xizang medicine and Xizang medicine culture popularization, such as digital books, popular science games, souvenirs, etc; Combining the tourism resources of Xizang medicine and Xizang medicine culture, create digital tourism experience projects, such as virtual Xizang medicine museum tour, Xizang medicine diet production experience, etc., to achieve win-win economic and social benefits of science popularization digitization, and provide strong support for the sustainable development of Xizang medicine and Xizang medicine culture science popularization digitization.

6. Conclusion

The digitization of the collection resources of the "Plateau Treasure - Xizang Medicine and Xizang Medicine" of the Xizang Natural Science Museum is a work of great significance and broad prospects for development. Through innovative digital preservation strategies, popular science content design and dissemination platform construction, as well as effective responses to practical problems and positive prospects for future development, the precious national cultural heritage of Xizang medicine and Xizang medicine culture can be revitalized in the digital age, better serving the public's scientific and cultural literacy improvement and the inheritance and development of Xizang medicine and Xizang medicine culture. In future practice, continuous exploration, innovation, and improvement are needed to promote the digitalization of Xizang medicine and Xizang medicine culture popularization to new heights.

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