

Research on Content Optimization Method for Museum Image Communication Based on Cognitive Communication

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ABSTRACT

The dissemination methods of museums based on visual media such as images have a profound impact on enhancing public participation and cultural acceptance. With the rapid development of information technology, the reception habits and cognitive styles of audiences have also changed, posing new challenges and requirements for the image dissemination of museums. Therefore, this paper systematically explores the optimization methods for the dissemination of museum image content, in the hope of effectively improving the dissemination effect of images and enhancing the cultural experience and cognitive participation of the public through precise strategy implementation.

KEYWORDS

Cognitive communication; Museum; Image dissemination; Content optimization

1 Introduction

Museums are guardians of culture and history, and also important platforms for the dissemination of modern culture. With the development of digital technology and the arrival of the information age, the communication strategy of museums is gradually transforming; Among them, image dissemination is increasingly valued as a powerful visual communication tool. In the field of visual communication, images not only convey information, but also subtly influence the audience's perception and interpretation. Cognitive psychology holds that the process of human understanding of images is not only a direct sensory response, but also a dynamic and complex information processing process involving the allocation of attention, activation of memory, and emotional response.^[1]

With the acceleration of globalization, the audience of museums is becoming increasingly diverse. This requires museums to consider cross-cultural visual communication strategies in the process of image dissemination. In summary, this paper aims to propose specific optimization strategies through systematic analysis and research, in the hope of improving the dissemination effect of images through scientific methods, enhancing the cultural experience and cognitive participation of the public.

2 Definition of Concept

2.1 Image Propagation

Image dissemination is a multidimensional communication process aimed at conveying information, educating the public, and enhancing the cultural experience of the audience through

visual media. The dissemination of images in museums encompasses the visual display of physical exhibits and includes virtual exhibitions realized through various digital media. The application of images in museums is far more than just displaying cultural relics; It constructs a visual narrative, telling stories of history, science, or art through carefully designed exhibitions and visual guidance strategies. Every exhibit image and layout design is an accurate calculation of the audience's visual focus. This aims to arouse the curiosity and exploratory desire of the audience, thereby enhancing educational effectiveness and cultural immersion.^[2] In addition, the effectiveness of image dissemination is influenced by various factors, including image quality, presentation style, and interactive design with the audience. High quality images can better attract the audience's attention and provide richer visual information, while interactive design can enhance the audience's sense of participation and experience.

2.2 Cognitive Communication

Cognitive communication is a method of applying principles of cognitive science to communication practice. Cognitive communication provides a theoretical framework and methodological tools for the dissemination of museum images, in order to enhance the audience's reception efficiency and understanding depth, by adjusting the content and form of communication to better adapt to the audience's cognitive abilities and preferences. Specifically, cognitive communication research focuses on influencing individuals' cognitive processes through visual and other sensory information, including attention capture, perceptual encoding, memory storage, and information retrieval. The image dissemination in museums will consider how to design exhibition layout and interpret exhibits to adapt to the audience's attention distribution and visual search habits.^[3] In addition, cognitive communication focuses on the correlation between the content being disseminated and the pre-existing knowledge of the audience. As educational institutions, museums need to match their image dissemination strategies with the audience's existing knowledge and cultural background.

2.3 Characteristics of Museum Image Communication

The characteristics of museum image dissemination are manifested in multiple dimensions, each with its unique dissemination function and influence, as shown in Table 1 below:

Table 1 Characteristics of Museum Image Communication

Features		Description	Influence Factors
Educative nature		Museum images aim to educate the public and provide information about art, history, and science.	content accuracy, interpretability, and accessibility
Visual Appeal	Ap-	It emphasizes the aesthetics and appeal of visual elements to capture the audience's attention.	design, color, layout
Cultural Heritage		As a medium for cultural transmission, images carry and showcase cultural values and history.	cultural sensitivity and diversity
Interactive Quality		Through interactive displays, it can increase audience engagement and depth of experience.	technical application, user interface design
Accessibility	-	Image dissemination should be open to audiences from different backgrounds, including those with language and sensory impairments.	multi language support, assistive technology

Education is a visual appreciation, and it deepens the audience's understanding of the stories and history behind the exhibits through image interpretation and related text; Visual appeal is the most direct communication characteristic of museum images. Excellent image design can

immediately attract the audience's attention and interest, making them willing to have a deeper understanding of the exhibits; In terms of cultural heritage, museum image dissemination serves as a bridge connecting the past and present, not only conveying knowledge, but also cultural values and concepts; The interactive nature of images is the key to enhancing the audience experience. [4] Through technologies such as augmented reality (AR) and virtual reality (VR), museums can create more immersive exhibition experiences, increase interaction between visitors and exhibits, and thus improve information acceptance and memory retention; Accessibility is the social responsibility that modern museums should undertake to ensure that all visitors, regardless of their physical condition or cultural background, have equal access to and understanding of exhibition content.

3 Content Optimization Strategies

3.1 Visual Element Optimization

The optimization of visual elements in museum image dissemination is the key to enhancing audience experience and communication effectiveness. Specifically, optimizing image quality needs to start with improving visual clarity and detail representation. Every image displayed in the museum carries the responsibility of conveying detailed information and profound historical background. High resolution and accurate color reproduction are necessary in restoring images of historical scenes or artistic works. This helps the audience recognize small details, enhances the overall visual impact of the image, and enables the audience to more intuitively feel the charm of art and history. In addition, the style of the images reflects the unique perspective of the museum and also influences the emotional and cognitive responses of the audience. The use of nostalgic or retro style image processing can arouse the audience's curiosity and nostalgia for history, while modern or abstract styles can trigger new interpretations and reflections on art. When choosing the appropriate image style, museums need to consider the historical background, artistic characteristics, and expected audience response of the exhibits.

3.2 Information Structure Optimization

The core of optimizing information structure is to ensure clear information hierarchy, strong logic, and easy acceptance and memory of content, thereby enhancing the learning experience and knowledge absorption of the audience. The hierarchy of information is the key to ensuring that the audience can gradually deepen their understanding of the exhibition content. Information must be organized in an easily navigable form, with a natural transition from simple overview to complex details. When designing exhibitions, museums usually provide an overview or guide map at the entrance, outlining the theme and structure of the entire exhibition. On this basis, each part of the exhibits or images should contain sufficient explanatory text and charts to help the audience understand the historical and cultural background of each exhibit, as well as their position and significance in the exhibition theme. Meanwhile, the logic of information is a key element in optimizing information structure, and each part of the exhibition should be constructed based on clear logical frameworks such as timelines, thematic classifications, or geographic regions. This logical structure helps the audience establish connections between the whole and its parts, and guides their thinking and learning process, enabling them to absorb and organize information more systematically. In historical exhibitions, arranging exhibits and related images in chronological order can help visitors clearly see the development of history; In art exhibitions, displaying works classified by art genres or styles helps audiences understand the characteristics and evolution of different art genres.

4 Interactive Optimization Strategies

4.1 Interactive Enhancement

Interactive enhancement can be achieved by designing immersive and highly participatory interactive activities, allowing the audience to shift from passive viewing to active participation and exploration, thereby greatly improving the efficiency of information absorption and the educational value of exhibition viewing. Specifically, enhancing interactivity is often achieved by introducing multi sensory experiences; This experience allows the audience to participate in the exhibition through touch, hearing, and even smell. If augmented reality (AR) technology is used, viewers can see historical scenes that are not usually visible through their mobile phones or specific devices, or virtual travel across time and space through virtual reality (VR) technology. The application of this technology not only allows the audience to view static images, but also enables them to interact with exhibits and even participate in the reproduction of historical events, greatly enriching the audience's experience. In addition, interactive design should take into account the needs of personalized learning. Modern museums can provide customized exhibition interpretation through data analysis and user behavior tracking, adapting to audiences with different backgrounds and interests, in order to improve audience satisfaction and enhance the educational function of exhibitions.

4.2 User Experience Design

User experience design is a key lever to ensure that the audience can obtain maximum learning and experiential effects from the entire visit process. Therefore, from visual display to interactive interface, every detail must ensure that the audience's experience is coherent, intuitive, and educational. When designing user experience, it is necessary to consider maintaining the educational and in-depth content of the exhibition while also making the visiting process a pleasant and engaging experience. This involves optimizing the overall layout of the exhibition space to ensure that visitors can naturally move from one exhibition area to another. Meanwhile, in this process, it is necessary to reduce confusion or inconvenience through reasonable guidance and signage design. In addition, enhancing user experience should also consider the way information is presented, including adjusting the logical structure of the displayed content to ensure that the information is easy to understand and can stimulate the audience's interest and thinking. For complex exhibits or concepts, multi-level explanations can be provided through interactive media such as touch screens or augmented reality technology to help audiences better understand and absorb information.

5 Conclusion and Suggestions

5.1 Conclusion

This study explores the optimization method of museum image dissemination content based on cognitive communication. By analyzing the theories of image communication and cognitive communication, as well as their applications in museum environments, the paper clarifies the criticality of optimizing visual elements and information structures. This paper emphasizes the combined effect of interactivity and user experience design to enhance audience engagement and educational experience, and identifies multidimensional optimization strategies for museum image dissemination, providing a systematic approach to effectively enhance the cultural dissemination power of museums and audience acceptance.

5.2 Suggestions

Based on the research in this paper, the following suggestions are proposed:

(1) It's necessary to integrate and apply interdisciplinary research findings to enhance the interactivity and educational value of exhibitions. At the same time, in order to enable museums to achieve their cultural dissemination goals more effectively, continuous monitoring and analysis of audience behavior and feedback should be conducted to further refine and adjust exhibition design, ensuring that information transmission is both scientific and meets the actual needs of the audience.

(2) Museums should actively explore and apply advanced technologies such as augmented reality (AR), virtual reality (VR), and interactive media to enrich the audience's experience and explore new educational avenues.

(3) We should strengthen cooperation with educational and research institutions to jointly develop customized content and technological solutions that meet the needs of museums. This helps to enhance the scientific and educational nature of exhibition content, and can also promote the long-term development and innovation of museums in academic and cultural fields.

Funding

Project: National (Provincial and Ministerial) Social Science Fund Cultivation Project of Zunyi Normal University in 2023, Research on Cross Media Communication of Zunyi Red Museum (No.: 2023KYYB30).

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