

Research on Immersive Environment Design of Rice Paper Theme Exhibition Hall

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Abstract: With the development of society, cultural and artistic exhibitions have gradually become an important part of people's lives. The design of the exhibition environment plays a key role in the audience's experience and emotional communication. This research takes rice paper as the theme, discusses the importance and practice of immersive environment design of rice paper theme exhibition hall. By analyzing the historical and cultural background and characteristics of rice paper, combined with modern exhibition design concepts, an innovative immersive environment design scheme is proposed, aiming to make the audience more deeply understand and feel the unique charm of rice paper through sensory experience and emotional resonance.

Keywords: Rice paper, Theme exhibition hall, Immersive environment design, Sensory experience, Emotional resonance, Interactivity.

1. Introduction

Rice paper is an important art carrier in Chinese traditional culture, with a long history and unique production technology. As a place to display the culture of rice paper, the environment design of the theme exhibition hall should be able to arouse the interest of the audience, provide an immersive experience, so that the audience can better understand and appreciate the art of rice paper. Therefore, this study aims to explore how to create an appealing and artistic rice paper themed exhibition hall through innovative immersive environment design.

2. Research Status at Home and Abroad

2.1. Domestic research status and development trend

2.1.1. Research status of protection and inheritance of rice paper

There are about 355 articles on the protection and inheritance of the traditional skills of rice paper on the domestic knowledge network, whose research content mainly focuses on cultural interpretation, value research, process analysis and introduction, traditional skills research, and active state protection research. For example, Zuo Rusong (2008) analyzed the inheritance of traditional handicrafts of rice paper in Jing County from the aspects of the historical mode and particularity of the inheritance of traditional handicrafts of rice paper and the protection and innovation of technical property rights. Dai Jian (2016) analyzed the raw materials, processes, customs and values of rice paper production techniques, and proposed protection countermeasures from the perspective of cultural ecology. Fang Pan (2016), through studying the building environment of rice paper papermaking process in Xiaoling Village, Jingxian County, proposed countermeasures for the protection of the building environment of the original material location, the protection of production activity space, and the protection of skill inheritors; Zheng Jiuliang (2021) analyzed

resource elements, service elements, technology elements and value perception through the new media construction path of intangible cultural heritage "cultural memory", trying to provide ideas for the innovation of non-genetic inheritance methods and the new media construction of intangible cultural memory space.

2.1.2. Current situation of rice paper culture dissemination

In China's intangible cultural heritage, rice paper, as a classic style of paper for calligraphy and painting classics, is highly sought after by people, and media and techniques for spreading living craft culture are also emerging in an endless stream. However, due to the lack of scientific and technological capabilities of traditional handicraft industry [1], the spread of rice paper technology still remains in the initial media communication stage such as sightseeing and text and picture interpretation [2]. Zhu Yun (2016) proposed to construct and realize a new mode of rice paper propagation through the combination of virtual-reality, three-dimensional immersion and real-time interaction. Wang Mei (2016) proposed to use HTML5 technology to establish the design of rice paper cultural heritage website based on HTML5 from the interface design, multimedia display system, web games, online museum, map application and other modules.

According to the literature, the current media communication environment is far from meeting the needs of the audience and the development needs of rice paper. Therefore, it is imperative to combine this living skill with science and technology, and it is also one of the important ways to protect and inherit the culture of rice paper.

2.1.3. Exhibition hall design research status

Jiang Zhenyao (2021) believes that interaction design, as an emerging design field and concept, is involved in modern exhibition hall design with its irresistible force [3]; Zhang Jiahao (2022) put forward the corresponding ideas and design strategies of digital media technology in exhibition hall design [4]; Liu Yingming (2022) analyzed the practical application of digital media technology in modern display design in detail, and studied the application trend of digital

media technology in the future [5]; Wei Tiangang (2021) believes that it is very important for the audience to participate in the generation of the display content during the visit to the exhibition hall and improve the interactive experience of the audience [6]

2.2. Foreign research status and development trend

2.2.1. Exhibition hall design research status

Kim, Soyeon (2016) found a significant positive correlation between visitors' attention and communication. Information-based displays will make the communication between visitors and exhibitions more effective [7]; Lee, Yong Yi (2016) proposed that when displaying realistic virtual cultural objects in museums, multi-projection mapping technology should be combined with optical perspective display to overcome the limitations of traditional projection exhibitions [8]; Zidianakis, E (2021) creates interactive and immersive virtual 3D and VR exhibitions by establishing a "user-centric" digital platform to closely connect visitors with the exhibition hall and ensure a high quality experience for users [9].

In summary, by combing the research of different scholars at home and abroad, we conclude that the current research on the traditional skills of rice paper in Jing County mainly focuses on history, technology, reproduction, inheritance and protection, etc., while the research and application of the traditional skills of rice paper are limited to tourism and text and picture interpretation, etc., and there is a serious shortage in the research on the interactive innovation of exhibition hall. In the context of the rapid development of the Internet of Things, blockchain and information technology, it is necessary to combine the exhibition hall with the traditional technology of Jingxian rice paper for immersive interactive innovative design research. Therefore, from the perspective of immersive environment interaction design, how to construct the innovative design theory system and application method of Jingxian rice paper theme exhibition hall is the main task of this topic.

3. Immersive Environment Design Concepts and Principles

3.1. Definition and characteristics of immersive environment design

The immersive environment design aims to create an immersive experience that fully immerses the viewer in the world of the exhibition. Specific characteristics include emotional resonance, interactivity, sensory experience, and storytelling. Emotional resonance: Through the exhibition content and design means, stimulate the audience's emotional resonance, let them have resonance and emotional experience, enhance the artistry and education of the exhibition [10]; Interactivity: Designers deepen their experience and learning by creating interactive environments and interactive exhibits that encourage audience participation and interaction and make them part of the exhibition; Sensory experience: Through the use of a variety of sensory stimuli, such as sight, hearing, touch and smell, let the audience feel the exhibition content wholeheartedly, increase the interest and depth of the exhibition; Storytelling: Through carefully designed exhibition layout and plot arrangement, the exhibition content is presented as a coherent story, guiding the audience to

gradually explore and understand the exhibition theme.

3.2. The role of emotional resonance and sensory experience in exhibition design

Emotional resonance means that by showing the process, hardship and wisdom of rice paper production, designers can stimulate the audience's emotional resonance. The audience will be interested in and identify with the unique charm and cultural connotation of rice paper, and better understand and appreciate the art of rice paper. Sensory experience is through the design of a unique sensory experience, the audience can feel the texture, texture and characteristics of rice paper more intuitively. For example, designers can set up touch areas in the exhibition hall, so that the audience can personally feel the smooth and rough of rice paper, and its difference from other papers. At the same time, elements such as lighting, sound and aroma are used to create an atmosphere related to rice paper, allowing the audience to be more immersed in the content and situation of the exhibition under the stimulation of multiple senses.

3.3. Exhibition design concept and method based on interactivity

3.3.1. Interactive exhibit design

Designers can encourage audience participation and interaction through the design of creative exhibits [11]. For example, a rice paper calligraphy practice system was designed so that visitors could experience calligraphy creation in the exhibition hall and receive real-time guidance and feedback. Through such interactive exhibits, the audience can not only understand the basic skills of rice paper calligraphy, but also participate in it personally, enhancing the learning effect and participation.

3.3.2. Technology application and interactive experience

Combined with technology such as virtual reality, augmented reality and interactive projection, designers can create more diverse interactive experiences. For example, the design of a virtual reality exhibition area allows the audience to travel through time and space, personally visit the production process of rice paper, and have an interactive dialogue with the historical figures of rice paper. This technology-based interactive experience will provide audiences with an unprecedented immersive experience, deepening their understanding and experience of rice paper culture [12].

Through the in-depth discussion of immersive environment design, this study aims to provide theoretical support and practical guidance for the design of rice paper theme exhibition hall, so as to enhance the audience's participation, emotional experience and interactive experience.

4. Rice Paper Theme Exhibition Hall Immersive Environment Design Scheme

4.1. Overall layout and space design of exhibition hall

According to the characteristics and exhibition contents of the rice paper theme exhibition hall, a reasonable exhibition space planning and zoning design scheme was developed. The exhibition hall is divided into different areas, such as the entrance area, the main exhibition area, the interactive area, the rest area, etc., and the visitor flow and visit path are

reasonably arranged to ensure that the audience can visit the exhibition in an orderly manner and get a comprehensive experience.

According to the plot and story clues of the exhibition, the exhibition path and exhibition hall flow line are designed to guide the audience to visit according to a specific route to ensure that the audience can enjoy the content and significance of the exhibition in an orderly manner. At the same time, considering the comfort and mobility of the audience, set up appropriate viewing space and buffer area to avoid congestion and congestion.

4.2. Lighting, sound and visual experience design

Through the use of lighting, we can create a suitable atmosphere and visual effects to enhance the audience's artistic perception and emotional resonance of rice paper. Different color temperatures, brightness and lighting angles are used to highlight the details and textures of the exhibits, creating a unique exhibition atmosphere. Sound effect is one of the important sensory stimuli in the exhibition, through music, natural sound and sound interpretation, to create emotional resonance and emotional experience of music for the audience. The selection of music and sound materials suitable for the theme of rice paper echoes the rhythm and plot of the exhibition, so that the audience can be more deeply involved in the atmosphere and storyline of the exhibition. Lighting, sound and visual elements are organically integrated to create an audio-visual exhibition experience. Through the coordination of music and lighting, the audience is created to feel immersive, so that they are more immersed in the exhibition environment of rice paper theme.

4.3. Interactive exhibit design and participatory experience

According to the characteristics and exhibition objectives of the theme exhibition hall of rice paper, suitable interactive exhibits are selected and innovative designs are carried out. For example, design touch exhibits so that visitors can personally feel the texture and texture of rice paper; Design operable exhibits so that visitors can participate in the process of making rice paper; Design virtual experience exhibits that allow visitors to explore the history and culture of rice paper [13].

Use multimedia technologies such as projection, virtual reality, augmented reality, etc., to add a more diverse experience to the interactive exhibits. Through innovative technical means, visitors can interact with the exhibits in a more intuitive and interactive way, enhancing their understanding and participation in the culture of rice paper.

In the exhibition design, attention is paid to the participatory experience of the audience, and the design of fascinating interactive links and tasks. By providing opportunities for the audience to participate in the exhibition, such as personally experiencing the production process of rice paper, participating in calligraphy creation, participating in interactive games, etc., to stimulate the interest and participation of the audience, and let them get more in-depth experience and learning in the participation.

4.4. Art deco and ambience design

According to the characteristics of the theme of rice paper and the atmosphere of the exhibition, appropriate decorative

elements are selected, such as displaying paintings, placing display shelves and display props, etc., to highlight the artistry and uniqueness of rice paper. Designers can choose decorations with elements of rice paper, or use colors and materials that echo with rice paper to enhance the audience's perception and appreciation of the theme of rice paper.

Through the use of appropriate color schemes, create a color atmosphere that matches the theme of rice paper. Taking into account the soft and pure characteristics of rice paper, you can choose more soft and natural tones, such as beige white, light gray and so on. In addition, the design of the layout is also very critical, and the location and display mode of the exhibits are rationally arranged to present a harmonious and orderly overall effect [14].

5. Conclusion

Through in-depth research on the immersive environment design of the theme exhibition hall of rice paper, this paper aims to explore how to enhance the transmission and inheritance of rice paper culture, as well as the audience's participation, emotional experience and learning effect through the design principles of emotional resonance, sensory experience and interactivity. In the process of research, we analyzed the historical and cultural value of rice paper in depth, reviewed the current research status of exhibition design and immersive environment design at home and abroad, and clarified the research background and objectives.

In addition, we emphasized the importance of lighting, sound and audiovisual experience design to create the right atmosphere and emotional experience. Through the appropriate lighting Settings, music selection and integration of audiovisual elements, the audience is able to become more deeply involved in the atmosphere and storyline of the exhibition. On the other hand, this study also focuses on the design and participatory experience of interactive exhibits. We emphasize the key role of interactive exhibits in immersive exhibitions, through the innovative design of interactive exhibits and the application of multimedia technology, visitors can interact with the exhibits in a more intuitive and interactive way, enhancing their participation and immersion.

Finally, we look forward to the future development direction of immersive environment design in the theme exhibition hall of rice paper, including the deepening of science and technology application, the promotion of social and personalized experience, and the expansion of cultural creativity and cross-border integration. These prospects provide new ideas and opportunities for the dissemination and inheritance of rice paper culture.

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