

Visual Research on the Design of Immersive Rice Paper Cultural Theme Space

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Abstract: As an intangible cultural heritage of human beings, rice paper technology can be used as a design theme in the environment to improve the cultural quality of the environment. To spread the culture of rice paper, it is necessary to export the cultural content naturally. An immersive environment makes this easier to achieve. In the environment construction of rice paper culture, the atmosphere of rice paper culture is reflected as a whole through space layout and lighting atmosphere. The immersive environment construction with the help of virtual reality technology and interactive technology is a more detailed and vivid visual expression form. Through the overall and detailed visualization scheme design, the effect of inheriting the intangible cultural heritage of Rice paper in the state of deep addiction is realized.

Keywords: Rice Paper Culture (Xuan Paper Culture); Intangible Cultural Heritage Culture; Space Design; Visualization; Immersive Feeling.

1. Introduction

As the four treasures of Chinese literature, Rice paper plays an important role in calligraphy, painting and writing. Rice paper has a long history, with its development dating back to the Tang Dynasty more than 1,000 years ago. In the Song Dynasty, the demand for rice paper increased greatly, and the demand for rice paper produced throughout Xuanzhou exceeded supply. At the end of the Song Dynasty and the beginning of the Yuan Dynasty, Cao family moved to Xiaoling hamlet, Jing County, and made a living by making rice paper. The Cao family of Xiaoling hamlet improved the making technology of rice paper and promoted the development of the quality of rice paper. After the establishment of the Yuan Dynasty, the country realized the unification of the north and the south, the economic and cultural development, the prosperity of the painting industry, rice paper as a high-quality painting material was paid attention to, greatly stimulated the development of the rice paper industry.

Highly prized by artists, calligraphers and scholars for its texture, durability and ink-absorbing properties, Rice paper is an integral part of China's artistic and cultural heritage. As a representative of the national intangible cultural heritage and the intangible cultural heritage of humanity granted by the United Nations, Rice paper demonstrates its cultural significance and importance. In environmental construction, setting up the theme of rice paper culture and protecting the intangible cultural heritage of rice paper is one of the important forms of improving environmental quality and inheriting excellent traditional culture.

2. Establish the Visual Exploration Path of the Immersive Rice Paper Theme Space

The visual exploration of the immersive rice paper theme space emphasizes the important role of vision in the observation environment, and its goal is to let the audience rely on the visual sight to achieve introspection, and realize the effect that the subject considers himself to be part of the

content or activity. The immersive experience emphasizes a deep feeling that people have when facing the environment, media, technology, etc. In the state of immersion, the subject's senses, emotions and thoughts are closely connected, shielding the external surrounding interference, and completely entering the state of self-perception and inner thinking, which is an advanced mode of communication to achieve publicity effect. In contemporary times, the expression of intangible cultural heritage should integrate modern aesthetics and modern science and technology, emphasize visual senses, and achieve immersive visiting experience. Only in this way can it be more easily loved by contemporary people and realize the propaganda goal. By observing the spatial layout of the environment, lighting, and various visual contents related to rice paper culture, people can realize the mental state of being immersed in the theme space of rice paper.

3. The Layout Ideas of the Theme Space of Rice Paper

At present, the theme of rice paper culture is suitable for shopping malls, restaurants, museums and other Spaces with different functions. Before the spatial layout of the environment, the layout of the environmental planning should be consistent with the use of the space. The layout design of rice paper themed culture space, the process is to use rice paper culture as the theme or intangible heritage culture to guide the design. The spatial layout design of the theme of rice paper can be arranged in a large space, such as the exploration area of rice paper materials, the actual operation area of rice paper technology, the calligraphy experience area, the production area of rice paper crafts, etc. The spatial layout design of the theme of rice paper can also be based on the cultural elements of rice paper throughout the entire environment. Through reasonable design of tour routes or nodes, attract residents to watch, and guide people through the space or stay in a certain space. By guiding tourists to browse, help tourists explore and discover the history of rice paper, and help tourists understand the beauty of traditional Chinese craft embodied in rice paper.

4. Light Environment Design of the Theme Space of Rice Paper

Entering a space, the first thing you feel is the atmosphere formed by the color lighting of the space. In the interior design, natural light is always introduced into the space as far as possible under the conditions. The rice paper theme space first considers the use of large Windows or skylights and diffused materials to create a soft and uniform lighting environment. When lighting is used, the environment of the theme of rice paper is suitable to use warm and soft lighting, avoid strong light or cold light, in order to reflect the elegance of the new Chinese style. Using the soft, translucent characteristics of rice paper, set a light source on one side of the paper, by making the light source diffuse to soften the light source and avoid dazzling light, to achieve the ideal color and light intensity, such as warm or white LED bulbs and rice paper lampshade combined into the lamp.

Combined with the site conditions and display tasks, different lighting methods are used to illuminate different areas. The way of site lighting should highlight the characteristics of rice paper and promote the display of artworks. On the one hand, hierarchical lighting can be achieved through the use of homogeneous lighting, key lighting and focal lighting, so as to create changes in the depth of light and visual interest points of the theme environment. On the other hand, drawing patterns on rice paper lamps or blackout curtains can project meaningful patterns and shadows to enhance the interest of the environment. Use projection lighting to project complex patterns or silhouettes onto walls, ceilings, or floors, and these projections can create a silhouette effect on the walls.

Install adjustable lighting controls to adjust the intensity of light during the day and at night to achieve different atmospheres based on time and space functions. When paper artwork or art installations are for display, spotlights or track lighting can be designed, this through-focus lighting ensures that they have good light to reveal their intricate details and textures. Use dynamic lighting technologies, including color-changing leds, projection mapping and interactive lighting, to achieve mood and space transformation. Explore interactive lighting elements that respond to visitors' movements or gestures. For example, as visitors move through the space, lighting can change patterns or intensity, putting visitors in different moods. Coordinate lighting effects with any soundscape or audio element in the space, integrating sound and light to create a synchronized and multi-sensory experience.

Safety, of course, is Paramount in any environment. Designers want to ensure that all lighting fixtures comply with safety regulations and specifications. The environment of the rice paper theme, because the paper is flammable, therefore, the safety of the lighting environment appears more important. Even if the environment is designed for beauty, the safety of the lighting must be ensured. Lighting systems need to be designed to facilitate regular inspection, cleaning and replacement of lamps and bulbs. By carefully considering these lighting design factors, create a rice paper-themed lighting color environment that not only showcases the beauty of rice paper, but also allows visitors to immerse themselves in the charming lighting atmosphere.

5. The Immersive Visual Construction of the Rice-paper Themed Space

5.1. Immersive Environment under Virtual Reality Technology

Contemporary, the immersive construction of the theme space of rice paper cannot be separated from the assistance of projection technology, virtual reality technology, interactive technology and other technologies. The use of high-tech mapping on the rice paper art, or projected on the wall, the ground, so as to form visually stunning patterns. In the environmental design of the rice paper intangible cultural heritage exhibition hall, modern technologies such as projection mapping, virtual reality technology and interactive technology can be used to show the realistic effect in more detail, which can be used to show the evolution of Rice paper art or tell cultural stories. For example, through the coordination of the ground screen and three-dimensional perspective screen, coupled with the naked eye 3D visual effect and the design of virtual images, the thousands of miles of rivers and mountains and the beautiful environment of the rice paper production place will be presented to the audience.

In order to better express the history of the intangible cultural heritage of rice paper in the indoor environment, a virtual reality scene can be designed to realize the journey of the history of rice paper. Visitors wear VR headsets and embark on a historical journey, virtual traveling to the birthplace of Rice paper to explore its culture, technology and significance. The process of Rice paper is complex and takes a long time, with up to 108 steps. Visiting a workshop or learning the ancient process in person is not the best option for the general public. However, using VR to reproduce the lost ancient techniques of rice paper, construct a virtual process, reconstruct archaeological sites, and experience cultural relic restoration techniques can solve this problem. People in the state of immersion have realized crossing the history and are in the virtual time and space. With the help of virtual reality technology, people are deeply attracted by the visual content they see. The degree of immersion people experience depends on the quality of the immersion technology or the experience mode. Since people have witnessed the production environment of rice paper and understood the details of raw materials and processes of rice paper, people believe and identify with what they see more.

The use of virtual reality technology can provide virtual tourism. Visitors in modern commercial Spaces, museums, and bookstores can access various kinds of intangible cultural heritage studios remotely, opening the door to places they might not be able to visit in person for a real-like tour. For example, the Jing county Red Star Rice Paper Factory, Jing county Ancient Books Publishing House and other specialized business venues are not open to the public, and ordinary visitors are unable to enter the factory to see the production process. Using Internet technology and virtual reality technology, ordinary people break through this learning barrier and help people explore learning in an immersive way.

5.2. An Immersive Environment under the Concept of Interaction Design

5.2.1. Interactive Design of Offline Physical Stores

The interaction between tourists and non-genetic bearers in offline physical stores is reflected in the communication and

interaction in the rice paper making operation. The space is reserved for tourists to learn intangible cultural heritage technology and make rice paper products. With the help of artisans who are not genetic inheritors, visitors complete the process of paper making. The environment plans out the rice paper craft experience area, in which multiple production stations are established, each station is equipped with the materials and tools needed to make rice paper. Clear and concise text instructions or graphics are placed at each production station, and artisans guide visitors to complete the production of rice paper. Ensure the safe use of all materials and equipment, and provide protective gear such as aprons and gloves to keep visitors clean and safe during the hands-on experience. After the finished product has been dried, experiences can remove the sun-dried rice paper from the screen and take it home as a souvenir. Staff assist visitors in the proper use of materials and equipment, and encourage the creation of unique rice paper designs or artworks. Since cutting tools, pulp containers and other equipment are involved, and there are many technological processes, the layout of environmental space should reserve sufficient tool space, operating table space, drying space and sodium storage space for each station.

In addition to experiencing the traditional craft, the rice paper making area can also increase the creation area of rice paper derivatives and calligraphy copying area of interest to tourists. Visitors use rice paper to write, make creative products of rice paper, bind books of rice paper, etc., and learn about the culture of rice paper in an interactive way.

5.2.2. Interactive Design of Online Environment

Users interact with virtual objects in three ways: sliding, touching and manipulating. A suitable place in the room is reserved for large electronic screens and touch displays, which display images, videos and interviews with non-genetic bearers of various types of rice paper in each historical period. A browsing module with a timeline on the screen allows visitors to slide the timeline to understand the history and culture of the corresponding rice paper on the timeline. Interactive design In addition to sliding the screen, visitors can also explore the texture and thickness of different rice paper varieties with the touch of their fingers. Experiences touch rice paper products such as ancient books through special gloves or touch-sensitive gloves to maintain the integrity of cultural relics. When they touch the screen, it can provide haptic feedback to simulate the texture of rice paper. In interaction design, haptic feedback is combined with visual and auditory elements to create a more impactful experience. For example, the process of making rice paper requires gravity to pound the green sandalwood bark, and hearing the ear-pounding sound when seeing the hammering scene is

more likely to trigger an emotional response. In the immersive environment, the user also feels the physical hardness, vibration or pressure through the handheld controller, and communicates the judgment feedback to the device, thus achieving human-machine communication. Interactive feedback can create a strong feeling of integration between the subject and the physical device.

6. Conclusion

Immersive space design aims to create a more reasonable and scientific viewing environment in terms of space layout, lighting atmosphere and sensory experience, and to encourage visitors to form a state of immersion in it. As age and cultural differences affect individual perception and participation in immersive content, questionnaire survey, physiological measurement and behavioral indicators are used to assess and quantify participants' immersion experience level. VR devices are used to collect data on visitors' interactions and preferences, so as to form data analysis based on tourists' comfort and immersion level, so as to further improve future environmental design. With the progress of technology, the forms of visualization in the environment are more abundant, and the ways of human participation are more complex. Therefore, paying attention to the psychological needs of contemporary people, grasping the latest science and technology, and reflecting excellent traditional culture are the due meaning of adapting to this trend.

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