

# Application Research of Actual Environmental Experience Concept Combined with Digital Technology in the Design of Museum Ecological Civilization Education Exhibition

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**Abstract.** The museum is an important institution for carrying out ecological civilization education and improving the quality of the ecological civilization of people. At present, how to effectively improve the immersion and knowledge of the exhibition is an important topic facing the Chinese museum ecological civilization exhibition. The combination of the concept of actual environment experience and digital technology provides a new way to enhance the educational effect of the museum's ecological civilization. Taking the practice of the Hoh Xil Ecological Exhibition Area of Beijing Forestry University Museum as an example, this paper introduces the exhibition area with the guidance of the real experience principle, and builds a highly realistic ecological scene, combined with biological specimens from the original ecological environment and interactive digital media. The good ecological civilization missionary effect has provided new ideas for the ecological civilization education of Chinese museums.

**Keywords:** museum, ecological civilization education, actual environment experience concept, exhibition design, digital technology.

## 1. Introduction

A good ecological environment is the cornerstone of sustainable development of society. At present, China's ecosystem is facing problems such as low quality, continued threat to the ecological environment, and accelerated decline in biodiversity, etc. We must actively mobilize the forces of all sectors of society to govern it. Strengthening the education of ecological civilization to the public is an effective way to improve Chinese ecological environment. The museum is a social public service organization that integrates collection, research, display and education. Its classical exhibits and various media provide a firm foundation for the socialized education of ecological civilization. Faced with the development of digital technology, personalized experience and the trend of independent inquiry learning, how to turn abstract ecological civilization ideas into physical exhibition exhibits, is the primary problem faced by museum workers. This article takes the Beijing Forestry University Museum as an example. It analyzed the construction process of the museum's Hoh Xil Ecological Exhibition Area. It combined the concept of actual environment experience with digital technology and conducts a tentative exploration of the ecological civilization education exhibition. It provided reference for the development of ecological civilization education in Chinese museums.

## 2. The Significance of the Combination of Actual Environment Experience Concept and Digital Technology for the Museum Ecological Civilization Education

The actual environment experience refers to creating a specific field atmosphere in the actual environment and induces the subject to consciously mobilize the perception system to perceive and explore the environment as well as the elements in it. Thus, making people take the initiative to integrate the internal subjective world and the external objective world, so that they can constitute a dynamic and contextual unity with the environment. People will unconsciously understand the profound implications of the environment. The use of digital technology in the actual environment experience can make use of the multimedia, integration and interactivity of digital technology,

effectively expand the connotation and extension of the physical reality, and convey the environmental connotation thoroughly.

### **2.1 Create a Realistic Ecological Environment with a Strong Ecological Atmosphere**

According to the embodied cognition theory, the environment is a part of the cognitive system and the root of cognition. [1] Meanwhile, our body and mind are the roots of understanding. Therefore, the best way to carry out ecological civilization education is to put the public in a real ecological environment. Then they can understand the beauty of natural ecology, restore their understanding and cherish of nature, and unconsciously realize the recovery of ecological consciousness.

However, for the modern people who are busy all day long, there is little leisure time for them to relax in the original ecological environment. Based on the principle of authenticity, the actual environment experience concept uses museums' extensive resource channels and the open exhibition space to display the most vivid features of the original habitat and let the audience live in it. People thus can experience the original ecological environment nearby. This would greatly be improving the efficiency of ecological civilization education.

### **2.2 Break the Barriers between the Audience and the Exhibition, and Put the Education in the Experience**

Experience is an activity of consciousness associated with individual feelings and perceptions. It permeates the individual's thoughts, emotions, knowledge and skills. [2] From the perspective of education, experience is one of the basic forms of educational activities. [3] Experience through the existing experience and new knowledge of the main body, leading the subject to enter the situation from the context, and finally sublimate to the mood. Throughout the current exhibition design of Chinese museums, there are widespread problems such as the separation of exhibits from the original environment, the existence of barriers between exhibits and audiences and the stereotypes of exhibits, etc. The unsatisfactory exhibition environment is difficult to form a good visiting experience, so it is difficult to achieve the perspective exhibition effect.

Introducing the experiential experience into the museum's ecological civilization education, which means establishing a high-simulation eco-environment exhibition space in the museum and encouraging the audience to enter the exhibition area. It will mobilize the audience's thinking and various senses and promote them to interact with objects in the exhibition area. So that the audience can get a good environmental experience, profoundly comprehend the connotation of the exhibition. The aim of ecological civilization education will achieve .

### **2.3 Combine Digital Technology to Expand Exhibition Depth**

As a "living force" of museums, digital technology has greatly promoted the development of museums and is now widely used in the exhibitions of Chinese museums. Digital technology's characteristics, such as mobility, immersion, interactivity and multimedia, are the wings of the museum's ecological civilization.

In general, in actual environment experience of the museum with the core of ecological civilization education, the high-simulation ecological scene can implicitly awaken the natural attributes hidden in the hearts of the audience, and the digital technology can explicitly convey the knowledge content and educational concept. The audience and the exhibition have both physical direct contact and spiritual exchanges. The factual cognition and value concept are unified, which helps the concept of ecological civilization to penetrate the hearts of the people.

### **3. Practice in Museum Ecological Civilization Education Exhibition Design, Which used Actual Environment Experience based on Digital Technology**

#### **3.1 Prototype Selection: Hoh Xil Nature Reserve, the Model of Ecological Protection**

This exhibition area selects the Hoh Xil National Nature Reserve as a prototype for construction. It hopes to make the audience feel the beautiful ecological environment of Hoh Xil, so they will reflect on the evil consequences of destroying the ecology and the necessity of protecting the ecology. In this way, it will make the concept of ecological civilization deeply rooted in the hearts of the people.

#### **3.2 Exhibition Design: Creating a Digital Reality Ecosystem Experience with the Core of Ecological Education**

##### **3.2.1 Investigate the Ecological Environment of Nature Reserve and Propose a Reasonable Exhibition Area Plan**

Creating a real habitat atmosphere is a prerequisite for the audience to have a good experience, and is the first step to effectively convey the concept of ecological civilization. In order to highly restore the habitat of the Hoh Xil Reserve, the project team went to the reserve to get a comprehensive understanding of its ecological environment and then summarized its typical characteristics. Based on this, the plan for the construction of the exhibition area was put forward.

##### **3.2.2 Show Ecological Details in Nearby View**

The nearby area of the exhibition area is the main venue for the audience's activities and the core area of attention. In order to enhance the immersion of the nearby area, the project team used the reserve's original material, such as soil and rocks, to build it. It accurately restores the original features of the nature reserve, breaks through the geographical barrier between the audience and the original habitat, and makes the exhibition area a unique ecological charm, and constructs a detailed habitat discourse system.

##### **3.2.3 Show the Macro Atmosphere Through the Background Wall and Lights**

In order to enhance the atmosphere of the reserve in the exhibition area, we showed the broad natural space of Hoh Xil by drawing the background wall. While concealing the elements of the exhibition area, the background wall image also expands the depth space of the exhibition area.

The lighting in the exhibition area is designed to imitate the sunshine effect of the plateau in Hoh Xil. Through the design and matching of the brightness, color temperature, projection angle and illumination beam angle of each lamp and lamp group, we successfully simulated the daylight effect of the reserve, which adds the authenticity of the ecological atmosphere of the exhibition area.

##### **3.2.4 Use the Original Ecological Environment Biological Specimens to Highlight the Vitality of the Exhibition Area**

As a famous 'highland wildlife gene pool' in the world, various creatures are the elves that make the Hoh Xil Reserve alive, so the display of nature reserve creatures has become the core of the exhibition area design. The biological specimens from the original habitats carry the most pristine and original source of the reserve, which can perfectly present the most vivid and realistic form of the Hoh Xil life, thus creating a strong sense of presence for the exhibition area.

##### **3.2.5 Digital Interaction Technology Helps Enhance the Experience and Convey Ideas**

The physical scene provides a basic environment for the ecological exhibition, but the rich information contained in the exhibition area must be presented to the audience in a visual way, in order to achieve the goal of ecological civilization education. For this purpose, we developed a original digital interactive application APP 'Kekexili'. Combined with the features of the exhibition area and the knowledge of specimens, it has set up three modules that are closely linked to the exhibition area, which are knowledge promotion, ecological protection education and fun interactive

games. It has played a good role in promoting the audience experience, imparting exhibition knowledge and conveying ecological concepts.

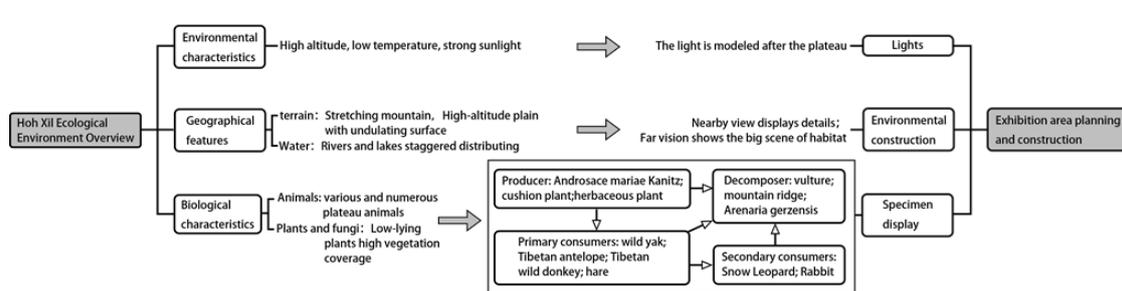


Fig. 1 Comparison of nature reserve ecological environment and exhibition area construction

#### 4. Discussion

The construction of the “Hoh Xil Ecological Exhibition Area” of Beijing Forestry University is an innovative experimental measure for ecological civilization education in Chinese museums. The combination of actual environment experience concept and digital technology allows the audience to learn through experience and insensibly get the concept of ecological civilization. The combination of the eco-civilization theme exhibition and the real-world experience of the 'Hoh Xil Ecological Exhibition Area' makes up for the lack of advanced, systematic and professional ecological civilization education platform in China. It provides a new idea for the museum ecological exhibition and the mission of ecological civilization.

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