



Digitization of Museum Curation Through Incorporating Virtual Reality Technology

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Abstract. Virtual reality technology has grown increasingly valuable as a result of the wave of digitization and the arrival of the information era, and it is highly regarded by people from all walks of life. Along with the social economy of the nation expanding quickly, socialist spiritual culture is also progressing at a rapid rate, and China's cultural endeavors are thriving. The state and government departments are paying an increasing amount of attention to museums, art museums, and exhibition halls as monuments and city business cards as China gradually becomes more urbanized. The museum's primary duties as a multifaceted organization are to gather and present exhibits, protect, and conduct research. The museum serves the general public by providing social, cultural, and educational services as an educational institution. The design of museum exhibits is constantly being infused with high-tech technology as a result of the development and emergence of virtual reality technology [1]. This has transformed the formerly dull physical museum exhibition, increased the popularity of the museum, and greatly improved the experience and enjoyment of a museum visit.

Keywords: virtual reality technology · digital museum · interaction design

1 Introduction

This study examines the current state of cultural creative products produced by museums, combines the resources of small and medium-sized museums' collections with local culture, and examines the design concepts, design process, and issues that arise during the creation of cultural creative products by museums through field research, literature review, and case study. The design and development of Jiaozuo Museum's cultural and creative products is carried out through research and analysis of the local culture and cultural relics, using the museum's key cultural artefacts as the entry point, delving into their cultural connotations, extracting the cultural elements of the collection, and fusing the functional and interactive elements of the products. In order to strengthen the social education function and boost public participation in Jiaozuo Museum, this study designed and developed museum cultural products with distinctive cultural elements

based on research and analysis of the collection resources and regional culture. This study also summarised the research and practical significance of this topic to provide reference value for the design of museum cultural products at the same level.

This study aims to address issues that arise frequently in high school art appreciation classes, including the fact that many students find these classes to be tedious and boring, the appreciation method is rather straightforward, the images shown in the classroom are abstract, and they feel detached from the work of art. In order to understand the current situation of contextual teaching in art subjects under VR conditions and provide effective learning models and suggestions for the teaching of high school art appreciation classes, this study focuses on the fundamental connotation of Virtual Reality technology (VR) and its theoretical underpinnings, combined with the VR-related content designed and developed.

2 Literature Review

In comparison to other terms, the number of studies on “virtual reality,” “museum,” and “VR technology” is relatively large, according to the author’s search and statistical findings of the database on the Internet [2]. Compared to other keywords, these four keywords have received a fair amount of investigation. In “VR technology-based interaction design for virtual museums,” written by Ping Lv, Pengfei Yang, and Xu Li, among others, they alter the conventional notion of interaction design and investigate a fresh, user-experience-focused interaction design in immersive virtual museum exhibits [3] (Fig. 1).

2.1 VR Application

The development and use of virtual reality (VR) technology has the flexibility to produce rich and varied learning scenarios, overcome the constraints of textbooks, transform abstraction into concreteness, expand the subject matter of art education, and overcome the time and space constraints of art classroom teaching [4]. Contextual innovative teaching can be achieved through the use of VR technology, which can improve the learning environment, realize the visual experience that is impossible to achieve in the classroom, and increase students’ enthusiasm for learning art. This will further improve the contextual learning effect of students in high school art appreciation courses. This will improve the learning outcomes for students in the course on art appreciation even more. It will also enhance the use of contextual teaching techniques, enhancing students’ cognitive abilities, cultivating their explorational and aesthetic awareness, further igniting their creativity and innovative spirit, fostering their comprehensive and individual development, and establishing the fundamental literacy of the arts.

Virtual Reality (VR) is a broad technology that first appeared towards the end of the 20th century, and it was developed in the United States. Jaron Lanier, the creator of VPL Research, first put up the idea in 1989. Lanier defines virtual reality as a three-dimensional interactive environment created by a computer in which people can engage and take on roles to have an experience. The VR Technology and Education Laboratory was founded in 1992 at the University of North Carolina in the United States to assess the

Keyword /Publication	Journal article	Dissertation	Conference paper	Experiment results	Experiment report	Standard	Total
Digital museum	1356	149	496	8	0	0	2009
VR	6424	96	423	9	9	0	6961
Interaction design	3196	531	162	8	0	1	3898
Virtual reality	19315	3880	2312	174	33	0	25714
Immersive interactions	79	11	3	1	0	0	94
Virtual museum	384	70	111	7	0	0	572
Museum	45300	1477	4976	55	3	15	51826
VR Technology	2267	40	57	4	0	0	2368
Museum digitalization	613	34	213	2	0	0	862
Interactive design	6563	2722	601	23	2	27	9938
Total	85500	9010	9354	291	47	43	104245

Fig. 1. Summary of Wafang Smart Search Data.

value of virtual laboratories and to contrast them with other forms of educational media. The Distance Virtual Education Lab, the first of its kind in the world, was developed by the University of Padova in Italy. The University of Newcastle uses VR technology for language learning, safety training teaching, and healthcare, further researching and examining the integration of virtual reality education with classroom instruction. The UK is also a pioneer in the use of virtual reality in education. Contextual teaching may be developed and implemented in a vivid and realistic teaching environment thanks to the immersive, interactive, and conceptual nature of VR technology, which further increases the effectiveness of contextual teaching. As virtual reality technology has advanced, a variety of items related to VR glasses have been available. These devices improve the immersive experience of consumers and are progressively finding widespread use across many industries, particularly the gaming and education sectors [5].

2.2 VR Incorporation Situation in China

Due to the late start of domestic VR research, the research and development of digital museums are still in their infancy. The depth and breadth of the research are insufficient, but data search and analysis show that the community is becoming increasingly interested in the creation of digital museums. Studying the usage of VR interactive design in digital museums has theoretical and practical ramifications from an academic perspective. Regarding commercial applications, the initial investigation into the use of VR in digital museums prompted the development of a system for virtualizing the presentation of digital content and assessing the advantages and disadvantages of its own network platform in conjunction with its own features. In terms of presentation, cultural artefacts and

resources can be spatialized, informationalized and virtualized using three-dimensional models, virtual reality, animation display, multimedia entry, and other techniques. So that everyone can experience the beauty of Chinese cultural artefacts through the simulation effect, the distance between the experiencer and the museum is widened and the museum exhibits are displayed virtually.

American philosopher and educator John Dewey held the view that “thought emerges in the immediate context. The renowned study “Contextual Cognition and the Culture of Learning” (Brownetal, 1989), written by Brown, Collins, and Dugid, thoroughly explores the theory of contextual cognition and learning and asserts that information is contextual in nature. They contend that activity, context, and culture are all components of knowledge and that activity is how knowledge develops. It is clear that as learning theory and schooling evolved, individuals progressively came to appreciate the value of contextual education.

2.3 The Rise of the Modern Museum

The early collections were undoubtedly quite private, it is true. They were put up in the private quarters of nobles, members of the royal family, and prominent church leaders. But it had to be very open in order to be a weapon of dominance over the populace. Therefore, the public and private aspects of museums are somewhat at odds with one another.

Much of the literature on the subject of the private and public nature of museums makes reference to the Louvre’s interior, which was the scene of a historic event when it was opened to the public. The fact that a museum has made it into the annals of history indicates the significance of the Louvre in the history of human art and, more broadly, in the history of world civilisation.

The well-known British scholar Henry James described his own emotions upon entering the Louvre in the following words: “The paintings in the museum gave me the impression that I could observe France, and even all of Europe, as well as the cultures, customs, and histories of each European nation, through paintings or sculptures. This impression gave me the hazy impression that this was a form of untaught education. Although it was unclear to me, it felt like this kind of schooling was what I had in mind.” In this way, the Louvre’s accessibility served as a bridge between its academic community and the wider world. Scholars from all over the world flocked to the Louvre as soon as it opened to the public to view only the finest works of human creativity [6]. James Shinn, an American academic, also shared his opinions on the Louvre. He claims: “As soon as I stepped inside the Louvre, I could see that the many artworks and exhibitions in the expansive galleries served as representations of the might of the European states throughout history, providing additional proof of the intimate relationship between art and politics. When using art to educate the populace, this museum makes sense.”

The French Minister of the Interior and Finance added that “the world should celebrate its (the Louvre’s) growth as a symbol of the power and wealth of our country” because “the Louvre is a place where the power of the state must be shown, and while it is a show of power, the wealth of the country should be an important message to be conveyed by the exhibits in the museum.” Napoleon also entered this revered palace by the end of the 19th century after an increasing number of people had done so, according

to the director of the Louvre: “Napoleon, as you enter this holy space, you immediately notice the factuality and order of the displays, which have been not only gathered but also arranged by classifying all the works of art. We want the general public to feel as though they have learned something about history by giving them a better watching experience.”

3 Discussion

In comparison to other terms, the number of studies on “virtual reality,” “museum,” and “VR technology” is relatively large, according to the author’s search and statistical findings of the database on the Internet. Compared to other keywords, these four keywords have received a fair.

It is obvious that an artwork’s social value can be largely judged by how well it is presented to the public. Whether social value is perceivable through artwork can assess it based on how the audience reacts to the artwork [7].

3.1 Artistry

The most fundamental and significant aspect of the artwork is its artistic nature, which is represented by the top of the triangle [8]. After the artwork is completed, aesthetics will be used to portray the artistic beauty it carries as well as the cultural significance it aims to impart to the audience. During this process, the audience’s feelings and intuition will play a significant role in forming aesthetic judgments. When people look at a painting, the hues, drawing styles, lines, and shadows are aesthetic creations; when listening to music, the pitch, rhythm, and colour of the instruments played are the most immediate aspects that we can sense; and when watching a movie, this feature is much more visible.

As a result, a work of art’s artistry cannot be isolated from the object’s sense of hearing, touch, sight, and smell, and it is possible to say that the object’s senses are a collection of the work’s artistry. As a result, the first impression that an individual has of an artwork (intuition) is crucial to the aesthetics of the piece as a whole. In fact, one may claim that the artifact itself is the source of the artistry.

3.2 Historicity

The historical aspect of artwork necessitates a deeper level of contemplation and insight on the part of the item than artistry does [9]. If historical is the understanding of the object, then artistic might be thought of as the intuition of the object. When we talk about understanding, we respect the object’s interpretation of the artwork, evaluating if the object can situate the artwork in its original historical context and appreciate it. Understanding is not as superficial as intuition. Consider the aforementioned illustration, where Christ’s right hand is raised during the masterpiece “Christ’s Baptism.” The historical context of the painting’s creation will therefore be necessary to comprehend the depiction of Christ’s baptism.

The painting was initially displayed in a monastic chapel. For people who view the picture in the new galleries of the National Gallery of Fine Arts, the context of the abbey church building structure with significant historical and modern significance - is crucial.

Second, Christ's right hand is raised as a warning, a gesture of gratitude, and other actions for the Christians gathered in the chapel. Christians can better understand the work's original meaning and implication when they are standing in front of this image. Therefore, the historical essence of the artwork can be clearly exposed if one can fully appreciate the historical context and setting of the right hand raised by Christ in this painting.

Since historicity differs from artistry, it must be based on the object's understanding of the painting. This understanding, which is more in-depth than intuition, serves as a crucial point of reference for our discussion of the historicity of the worth of the artwork.

3.3 Academic Value

It is necessary to investigate the academic nature of the value of art. We have already reached the stage of empathy if, when appreciating art, we find ourselves unable to help but empathise and experience emotion [10]. At this point, we can create new experiences of empathy based on the original design of the art. Naturally, empathy will serve as the starting point for our discussion of the artwork's academic merit.

The value of the historical artwork is primarily derived from the viewer's capacity to comprehend, when the audience is in front of a work of art, through their intuition to see the When the viewer is confirmed, the viewer's first intuition, that is, their intuition and feeling in the face of the artwork when visiting the artwork, can assist us in the appreciation of the artwork value directly feel the art value of the artwork, is followed by the historical artwork value [11].

4 Conclusion

The primary locations for gathering, displaying, and analysing the surviving artefacts as well as educating the public about the natural and cultural legacy are museums. People's access to fresh information and knowledge has expanded along with science, technology, and the times. Museums are continually changing and evolving as a result of the digital era and the use of new media. In this situation, conventional museum exhibits are unable to satisfy the public's expanding cultural needs. Traditional museums have relied on a "material-based" strategy to teach people about history, with one-sided displays and dissemination that lack communication and make visitors passive recipients of information rather than igniting their curiosity and interest.

It has been demonstrated that traditional physical museum display methods and design concepts cannot keep up with the demands of the new era, and the creation of digital museums based on VR technology plays a crucial role in the long-term development of museums. In addition to maximizing the use of the museum's current resources, the mix of digital creation and virtual material will aid in the museum's long-term preservation. It is obvious that digitalization is essential to the growth of museums and is a necessary trend for their long-term survival in the age of new media and digitization.

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